1 The Age of Smoke

Smoke was the most severe air pollution problem of the late nineteenth and early twentieth centuries. Wherever coal was used in major quantities, smoke and soot, the typical by-products of incomplete combustion, infested the local atmosphere, provoking countless complaints and attempts at abatement. But this fact alone conveys an inadequate sense of what it meant to live in the age of smoke. The key characteristic of smoke was its pervasiveness: one did not simply live with the problem of smoke, but literally in it. In urban areas, smoke was everywhere: in cities large and small, in industrial and residential areas, in rich and poor neighborhoods. Almost all urban agglomerations were struggling with the smoke nuisance, from Berlin to Chicago, from scenic Heidelberg to industrial Pittsburgh. Smoke was a constant companion of urban life, a pollutant that every city dweller was inevitably breathing on a daily basis. Smoke stuck to facades and monuments, making for the pervasive gray so typical of late nineteenth-century cities. It entered homes, besmearing rugs, curtains, and anything else that was not safely tucked away. The faces and clothes of urbanites carried smoke's hallmark, and in some of the worst cities it was customary for white-collar workers to bring a second shirt to work, since the first was usually soiled by midday. In fact, many saw smoke as more than a material problem: smoke was the modern city's halo, a darkish cloud that was often the first thing visitors saw. Smoke was the symbol of urban gloom, a word that rhymed with *doom,* and not only for prophets of cultural despair.

Of course, urban pollution problems were not in themselves new: they are likely as old as cities themselves. But two factors made the smoke nuisance particularly awkward. The first was the stupendous growth of cities during the nineteenth century. Both Germany and the United States saw

the rise of vast urban agglomerations, many of which comprised more than a million people by 1900, along with a concentration of energy-intensive industries that had no precedent in the history of either country. The second was the sheer pervasiveness of coal use, specifically the use of soft coal, which was prone to creating smoke during combustion. With coal replacing wood as the dominant fuel during the nineteenth century, and with the per capita use of energy on a sharp upswing, coal was practically everywhere in late nineteenth- and early twentieth-century cities. It was used in homes and in industry, in transportation and power generation, for the production of electricity and as the basis for a burgeoning branch of industrial chemistry. Regions rich in coal deposits were thriving economically; regions distant from such deposits complained bitterly about their misery and often made frantic efforts to secure a reliable supply. Some cities were fortunate: for instance, New York City lay close to the only large anthracite deposits in the United States and thus had easy access to a type of fuel that was much easier to burn without smoke than soft coal. But most cities were not so lucky, with some suffering further if valley locations made them prone to inversions and poor ventilation. Smoke problems had thus become the rule in most German and U.S. cities by 1900, a constant reminder that modern society's dependence on coal came at a price.

The smoke nuisance challenged authorities nationwide, in both Germany and the United States. Many people agreed that fighting smoke had to be the key goal of contemporary air pollution control, the problem that regulatory agencies simply had to solve if they wanted to make any legitimate claim at environmental protection. But at the same time, existing laws and procedures quickly proved inadequate for an effective antismoke drive. American nuisance laws, as well as traditional German regulations, were cumbersome and complicated instruments that saw pollution as an isolated incident, not as a universal feature of modern life. As a result, discussions arose in both countries around 1880 over what to do about smoke, with input from industrialists, engineers, physicians, public health officials, and an enraged public. By the early 1900s, the U.S. air pollution debate of the Progressive Era—and its equivalent in Germany—had reached a degree of intensity that would remain unmatched until the 1960s.

Coal smoke, however, was not the first industrial air pollution problem. In Germany, sulfur emissions from copper smelters had been a political issue since the mid-nineteenth century; in the Western United States, conflicts between metal smelters and their neighbors over sulfur and arsenic pollution had escalated to what one observer called a "life or death struggle."[1] But the general public gave the lion's share of its attention to coal smoke, and

urban smoke became a defining political issue. As a result, laws and institutional reforms were focused on coal smoke, far more than on any other air pollution problem. It is no exaggeration to say that coal smoke was the crucial institution-builder in the field of air pollution control, with countless smoke ordinances, rules, and regulations instituted and special "smoke inspectors" waging a desperate fight against this urban plague. Especially in the United States, smoke abatement became almost synonymous with air pollution control, until the mid-1940s. Urban smoke defined the development of regulatory bodies, and its effect remained significant even after the smoke nuisance itself was gone.

In retrospect, the fight against smoke looks like a protracted and mostly ineffectual battle—had it been otherwise, the age of smoke would have been a mere episode. But such a reading underestimates the huge extent of the problem and the obstacles to addressing it. Except in West Coast cities, coal was the dominant fuel of the early 1900s, and every smoke abatement strategy had to cope with a host of outlets: industrial enterprises, railroads, commercial buildings, apartment houses, and—not by any means least—domestic furnaces. As a result, launching a successful attack on smoke demanded clever strategies, significant resources, and a good deal of patience. To be sure, Progressive Era antismoke activists did hope for a quick solution; Pittsburgh's Smoke and Dust Abatement League even held a competition for a new municipal nickname in 1916, believing that the city's classic epithet—"smoky city"—would soon become obsolete.[2] But such hopes were quickly dashed, activists realizing that the smoke nuisance allowed at best "steady, though perhaps slow progress," as the Women's Club of Cleveland noted in 1923.[3] For an industrial society with almost universal coal combustion, the smoke nuisance presented a gigantic challenge.

Although smoke was a pervasive problem, it was not always perceived that way. It is impossible to discuss smoke without addressing class, race, and gender: pollution loads differed greatly according to one's place in society, and so did perceptions of the smoke nuisance. For owners of property in downtown areas, smoke was first and foremost a financial problem, and men in real estate thus became some of the most dedicated proponents of smoke abatement. The same holds for cleanliness, a key concern for antismoke activists, but also one with pronounced class implications. Notably, complaints did come from all segments of society, belying bourgeois stereotypes that cleanliness was of no concern to the lower classes.[4] But a bourgeois bias is still evident in the politics of smoke abatement, although American environmental historians have been somewhat reluctant to look into this issue. The American drive against smoke mirrored a socially exclusive under-

standing of urban air pollution—a limitation as much as an opportunity. As Mancur Olson points out in *The Logic of Collective Action,* citizens are usually disinclined to voice concerns that they share with a large number of people. After all, their personal gain is greater when they focus on issues that affect only them or a small group of people who will profit from their activism as "free riders." Olson notes that collective interests, then, often do not emerge as powerful motivators until they have gained support from "selective incentives"—for example, a class-specific definition of an environmental problem.[5] While the present work steers clear of a dogmatic interpretation of Olson's argument, a history of air pollution control cannot help but give it some credit: as a rule of thumb, protests were strong when rhetoric emphasized the norms and values of a distinct group and weak when air pollution was seen as a concern of basically every human being. Changing this logic, at least to a certain extent, may have been the greatest single achievement of the modern environmental movement.

Overall, compared with concerns about cleanliness and property, the "health argument" usually took a backseat in air pollution rhetoric during the age of smoke. As Adam Rome notes, "The medical argument against air pollution always was a hard sell."[6] Some contemporary observers already found this an odd situation. "Strange as it may seem, the housewife is far less concerned with health than she is with the fact that her draperies are soiled or that her neighbor will soil her hands if she touches her furniture," a public health officer declared in 1928.[7] But since the demise of the miasma theory, which implied a broad environmental understanding of the causes of disease, the general public had come to think of health hazards mostly in terms of bacteria and viruses. As smoke seemed unsuspicious from a contagionist standpoint, the health argument did not emerge as a major concern until smoke was in fact disappearing from America's urban areas.[8] Nevertheless, the health hazards of urban smoke were substantial, even though it would take several decades of epidemiological research to discover their true extent. The greatest hazard stemmed from particles up to ten micrometers in size, for such extremely fine particles penetrate the thoracic region of the lung. Researchers today are unanimous about the enormous health hazards of small dust emissions. In 1992, for example, a World Bank study put the human toll from particulate matter in the developing world alone at between 300,000 and 700,000 premature deaths per year. While this figure remains open to dispute, it gives an impression of the implications of the age of smoke from a health perspective.[9] Unbeknownst to contemporary discussants, smoke abatement was literally a question of life or death for thousands of people.[10]

The age of smoke lasted longer than the reign of coal, beginning with debates about new laws and procedures against urban smoke around 1880 and finally tapering off around 1970, when environmentalists started voicing concerns about other, often invisible pollutants. Thus, the chronology of the age of smoke is almost identical with what Charles Maier calls the "age of territoriality": a time span of roughly a century, when the regulatory abilities of nation-states were at their peak. Beginning in about 1860, centralized nation-states assumed a new kind of control over their territory. To some extent, this was because of advances in technology, like railways and telegraph networks, which allowed goods and information to travel to a country's periphery and back with unprecedented speed. At the same time, political reforms, like the Unification of Germany and Japan's Meiji Revolution, laid the foundations of powerful government institutions. Beginning in the 1960s, however, according to Maier, the technological, cultural, and sociopolitical scaffolding of the nation-state began to erode and fall apart, in part due to the rise of strong supranational agreements and institutions like the World Trade Organization and the European Union, but most prominently through the erosive force of economic globalization. The age of territoriality slowly continued to fade throughout the last third of the twentieth century.[11]

From an environmental history perspective, Maier's argument might appear somewhat counterintuitive. What about the plethora of environmental laws since the 1970s that demonstrate the enduring strength of the nation-state? How do the creation of the Environmental Protection Agency in 1970 and the passage of powerful Clean Air Acts in 1970, 1977, and 1990 fit Maier's argument? Maier, however, does not describe the age of territoriality ending abruptly, its collapse resembling that of communism in 1989. Rather, the slow trend of global competition gradually undermined the powers of nation-states—and certainly, few environmentalists would doubt that economic globalization has indeed hampered many policies over the last forty years. Maier's argument thus implies a deep irony for the history of the environmental revolution, one that few environmental historians have taken note of: at the very time when ecological concerns were gaining importance politically, the nation-state's power base was beginning to erode. Starting in the 1960s, environmentalists were struggling not only with the usual obstacles to air pollution control—wayward industrialists, deficient laws, lazy officials, and so on—but also with a long-term decline in the nation-state's regulatory potential. Against this background, the age of smoke emerges as even more crucial: never before or since was the nation-state so well suited to defining and enforcing codes of acceptable conduct and creating institutions

to that effect. The age of smoke presented a historic chance to create a lasting regulatory tradition, one that Germany seemingly used far more effectively than the United States: the German regulatory system evolved from nineteenth-century traditions over several decades, whereas the American environmental revolution ultimately led to a break with preexisting traditions. The fact that the United States, unlike Germany, emerged from the age of territoriality without a firmly entrenched regulatory tradition may explain a great deal about the repercussions of U.S. environmental policy and its constantly shifting character.[12]

The moniker "age of smoke" carries a double meaning that is entirely intentional. Smoke, indeed, obstructed the vision of urban reformers in more than one sense. By focusing on smoke and other visible pollutants, they usually overlooked a wide range of other issues: lead and carbon monoxide from automobile exhaust, sulfur dioxide from coal combustion and metal refineries, cancerous pollutants from chemical factories and refineries, and so on. With visible damage so apparent, it was tempting to ignore questions about health hazards and focus instead on cleanliness and property issues. In hindsight, perhaps smoke abatement advocates might well have been more open-minded, seeing smoke as merely the most easily detectible among a host of air pollution problems, many more dangerous from a health and environmental standpoint than smoke and soot. But it is certainly easier to make this observation at a time when no employee still wonders whether his or her shirt will last beyond noon.

The priorities of activists during the age of smoke are not the only things that seem questionable in retrospect. Nothing would be more misleading than seeing the story that follows as one detailing merely a clash between polluters and their opponents: the history of air pollution control is full of hidden agendas that influenced the course of environmental policies, and a transatlantic comparison is a good way to identify these. Why did American engineers stress a professional duty to fight the smoke nuisance, whereas German engineers showed lukewarm interest, at best? Why did American industrialists, who originally fought smoke abatement tooth and nail, turn into defenders of air pollution control, while German industrialists were largely silent in public? Why did the famous Prussian bureaucracy fail so miserably in its drive against smoke, surpassed in efficiency by, of all things, the governments of large American cities, famously described by James Bryce as "the one conspicuous failure of the United States"?[13] And why did popular antismoke sentiment, a constant in both countries since the late nineteenth century, mirror wide fluctuations in civic activism? The age of smoke involved a host of separate interests, and this book makes a point

of highlighting them—not because I see them as illegitimate or disturbing but because they are a part of the story that conventional narratives tend to ignore. The age of smoke was about far more than the pros and cons of air pollution; indeed, most of the time, it was not really about the legitimacy of air pollution control at all. By the eve of World War I, the group of industrialists who opposed smoke abatement had shrunk to a small minority in the United States and was almost nonexistent in Germany, yet control efforts remained inadequate for many years. It clearly took more than good intentions to fight the smoke nuisance; good intentions, in fact, were little more than a minor beginning.

The coal smoke nuisance is gone from the Western world, the battle over coal combustion shifting to other issues like sulfur emissions and, most recently, their contribution to global warming. But while few environmentalists are aware of this, the age of smoke continues to influence ongoing debates about environmental problems. Most people—and indeed, many scholarly works—see air pollution control as a recent invention, the foundations of environmental policy laid down around 1970, when the first Earth Day celebration drew an estimated twenty million participants on April 22.[14] But 1970 was an ending as much as it was a beginning: this outburst of environmental activism spelled the end of a regulatory tradition that had grown out of the smoke debates of the early 1900s. The rise of environmental sentiments, in other words, coincided with a crisis of the existing regulatory system. The agencies born during the age of smoke were no longer able to sponsor an energetic drive against air pollution, but they were strong enough to hinder the rise of a new regulatory system—and, perhaps even more important, strong enough to leave many industrialists and experts with the honest impression that they had done their homework. This book, then, offers a new perspective on the environmental revolution, a perspective that should interest every environmentalist who wants to move beyond a Manichean worldview: the environmental revolution was more than the overdue outcry of a suffering population—it was also a classic case of miscommunication, and it was much better at demolishing regulatory traditions than at creating them. It is impossible to understand modern environmentalism without the age of smoke.

A book on the history of air pollution control can probably no longer claim to investigate a neglected topic. Research into urban environmental history has been under way for more than a quarter-century now, and it shows little sign of diminishing. Some early publications on the subject stand out for their staunch attacks on industry and their presumed political allies. Their

argument in essence is that the history of air pollution control was basically a history of willful negligence, the debate having been captured by industrial interests until the environmental movement entered the scene. However, recent publications have taken a more balanced approach, painting a more nuanced picture of the business community, paying more attention to the different parties involved, and examining more closely the cultural construction of pollution. The present book pushes this trend further, stressing the compromise inherent in environmental regulation: for all the political clout industrialists could muster, they rarely came out of air pollution debates with their original demands fulfilled. And on the one occasion when they did—namely, air pollution control in the United States after World War II—they would later pay dearly for their hegemonic ambitions.

This argument is prone to several kinds of misunderstanding, and it may be wise to confront these early on. First, speaking of the compromise nature of air pollution regulation does not mean that all parties benefited in equal measure. There can be little doubt that during the age of smoke, damage to property owners and the plight of housewives were far more significant than the losses industry incurred from fines, administrative proceedings, and inefficient fuel use. But environmental regulation is not a zero-sum game, where gains for one party inevitably imply losses for another. The smoke inspection approach, institutionalized first in Chicago in 1907 and subsequently copied all over the United States, provides a prime example here: it offered gains for city governments, engineers, industrialists, and antismoke activists alike. Conversely, the German approach to smoke abatement around 1900 did not satisfy the demands of either the public or the business community. The biggest winner in the German smoke debate was probably the bureaucracy, which successfully sustained a policy of processing incoming complaints in the least stressful manner. The German story thus also provides a reminder that it is insufficient to examine only the interests directly involved. While bureaucratic incompetence and failure of communication are not in anybody's interest, they clearly play an important role in the story that follows.

Second, an emphasis on cooperation and compromise in no way ignores or diminishes the fact that air pollution gave rise to vigorous complaints in both countries. Pollution caused enormous damage in Germany and the United States, and those who associate compromise with soothing industrial remarks of the "we have a common interest" variety are clearly off the mark. In fact, this book makes a point of putting public protests and campaigns front and center, for it is quite plain that in the field of air pollution control, little if anything gets done without pressure from an enraged

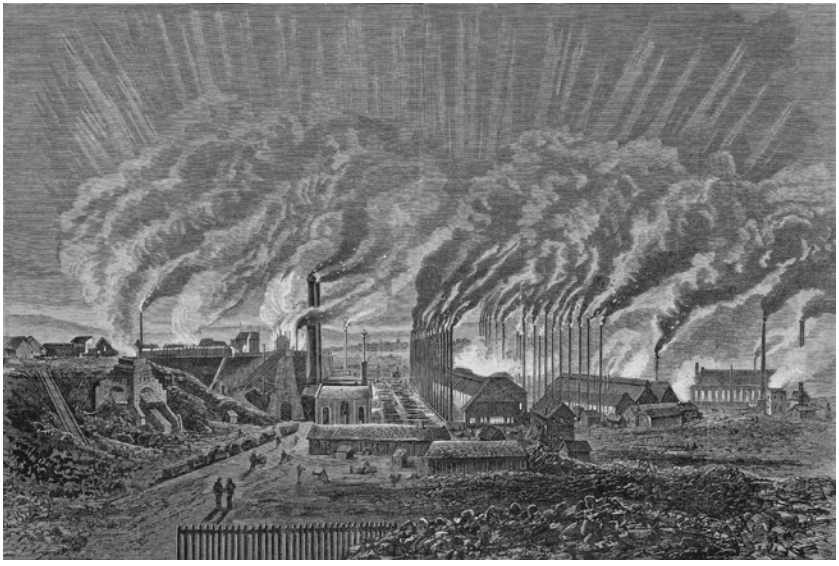

Figure 1. Many nineteenth-century pictures, like this 1876 depiction of the Burbach steel mill near Saarbrücken, Germany, celebrated emissions as modern industry's halo. However, when smoke and soot were a material reality rather than a symbol, industrialists were much more on the defensive. Image courtesy of the Deutsches Museum.

citizenry. Yet a book that spans almost a century cannot help but adopt a long-term perspective, and from this point of view, the limits of protests and campaigns become only too apparent. If it was difficult to start a powerful campaign against atmospheric filth, it was infinitely more difficult to sustain this campaign over the long term. As it emerges in this study, civic protest followed a typical pattern: some two or three years of intensive activism, followed by more lukewarm activities or even a total abandonment of the issue. Indeed, not many associations could claim more than a decade of sustained activism against the problems of air pollution. To be sure, there are a few examples of truly admirable endurance, like Cincinnati's Smoke Abatement League, founded during the Progressive Era, which continued to operate as the Air Pollution Control League of Greater Cincinnati until far into the environmental era. But impressive as these examples may be, it is painfully apparent that they are the exception to the rule. Before the rise of modern environmental organizations, civic protest was often haphazard and notoriously unstable, and regulatory styles inevitably reflected that fact.

In the end, regulatory compromise usually came about for lack of alter-

natives. Enraged citizens may be able to sustain a dedicated crusade for a while, but at some point, activism almost inevitably lags, and interest in compromise grows. Likewise, regulators and industrialists have an interest in some kind of a "gentlemen's agreement": after all, they are bound to meet time and again, and renegotiating the general terms of cooperation each and every time is, if anything, time-consuming and unnerving. In short, some kind of compromise was usually the path of least resistance: in the end, most people find it more advantageous to talk than to yell at each other. From an economic perspective, this might be seen as a quest to minimize transaction costs: a cooperative agreement is usually far less expensive for all parties involved than an all-out campaign. The question is not so much whether industrialists or protesters have to make concessions as it is what these concessions ultimately mean.

Thus, compromise is neither a cause for celebration nor a scandal—it is simply a fact of life that needs careful scrutiny. If this book demonstrates anything, it is that wholesale condemnation of cooperation is as shortsighted as general praise. Throughout history, "cooperation" has meant many different things. It was crucial for the development of the smoke inspection approach in the early 1900s, a strategy that was arguably the best approach possible under Progressive Era conditions. However, it was basically a smokescreen for industry's dominance during the 1950s and 1960s, when air pollution control progressed only slowly and with a rather narrow agenda. In Germany, while cooperation was originally a bureaucratic strategy focused on processing incoming complaints in the least stressful manner, it took on a more positive note in the postwar years, and the cooperative development of rules and regulations remains a prominent feature of German environmental policy to the present day. In short, no general alternative between strong state and weak cooperation exists. Cooperation can be tough, both on the problem and on the cooperators, especially if it is backed up in a sophisticated fashion by the powers of the state.

As a third caveat, I should emphasize that stressing compromise in environmental regulation is not meant to exonerate those industrialists who were fighting environmental regulation as a matter of principle. After all, the following material offers plenty of evidence that the evil industrialist is not simply a Hollywood invention, Erin Brockovich–style. Over the course of almost a century, a wide spectrum of attitudes must be acknowledged: from public-spirited corporate captains who felt an ethical obligation to curb their emissions, to narrow-minded industrialists who thought that air pollution control was nonsense. However, the vast number of businesspeople fell somewhere between these extremes. Had they not, one would be hard-

pressed to explain why radical crusaders against pollution control drew criticism not only from civic activists but also from the industrial community. Even a representative of an oil and refining company, usually a less cooperative sector, admitted in the early 1960s that "a small percentage of industry is irresponsible."[15] Nevertheless, searching for "black sheep" and "smoking guns" misses the point: while it is clear in some cases who was wearing the white hat and who the black, most look pretty grayish in retrospect. Even when an industry obstructed solutions generally, like auto manufacturers did in the 1950s and 1960s, a closer look seems advisable. Environmentalists, in this particular case, were right to sense that the auto industry was dragging its feet on the smog problem, but they were wrong to suspect a conspiracy at the root of this reluctance. As shown later, it seems quite likely that the auto industry's behavior was much more incompetent. Environmentalists were also wrong to take Detroit's behavior as emblematic of all industrial attitudes, and they probably did themselves little good by generalizing in this way. After all, criticism of uncooperative industries becomes much more forceful if one doesn't simply see such behavior as "business as usual." The notion of the evil industrialist, so prominent around 1970, was thus the classic case of a self-fulfilling prophecy.

Therefore, if this study emphasizes the compromise nature of environmental regulation, this does not mean that cooperation is either good or bad; too much depends on the specific context. The situation is clearer, however, for the opposite of cooperation—namely, antagonistic modes of regulation. In fact, what emerges here is that antagonistic approaches are rarely ever the result of a conscious choice: usually, they are the result of accumulated anger and an urgent desire to "see things happen." A desperate fight against vested interests thus looks less like a clear strategy than a makeshift, an approach protesters use until they realize that talking with the other side may have some merit as well. Revealingly, the Progressive Era's antismoke movement did not make significant headway until it scaled down its aggressive rhetoric, turning from strict prosecution to education and consultation with smoke-generating businesses. Indeed, has antagonism, by and large, really produced impressive results since the environmental revolution of 1970? Significantly, the age of smoke involved a rather small amount of litigation—important because history shows that the side effects of court proceedings are huge. Time and again, litigation has produced bitterness on both sides, an escalation of demands and rhetoric, and the postponement of a solution. For nineteenth-century jurists, court battles over pollution problems were veritable nightmares: complex, time-consuming, and difficult to control once they had begun. Even organizations with a clear antismoke record, like the Ameri-

can Civic Association, were skeptical of lawsuits, noting that "people have a very healthy and proper disinclination to involve themselves in litigation over nuisances."[16] During the age of smoke, investments in control equipment were always far greater than investments in lawyers' fees—something that is no longer certain with modern environmental litigation.[17] In fact, few approaches have a worse record historically than litigation, and environmental historians are well advised to emphasize this point. In the twenty-first century, perhaps the best way to convert industry to an environmental agenda is to demonstrate that antagonism is bad business.

One of the most surprising trends in recent environmental history research has been an ongoing attempt to rewrite the history of air pollution control from an antiregulatory perspective. When the original version of this book was researched and written in the late 1990s, the dominant impression was that air pollution control before 1970 was mostly ineffective, if not nonexistent. As a result, I devoted a good part of my intellectual energies to proving that pre-1970 air pollution control, while not perfect by any means, does deserve some credit for making inroads against at least some pollutants. But recent publications, most prominently by Indur Goklany, in his book *Clearing the Air,* paint an altogether different picture. Promising no less than "the real story of the war on air pollution" in his subtitle, Goklany vigorously attacks the rationale for forceful federal policy by stressing the accomplishments of pre-1970 air pollution control. He asserts that pollution loads had been falling long before federalization and that, more generally, the United States was already on a path toward better environmental conditions in 1970. Goklany thus challenges the rationale for federalization: the state of the environment, he argues, would have improved just as well, or even better, had the states remained in control. Goklany outlines his "environmental transition hypothesis" as follows: "As a country becomes more economically and technologically developed, in order to improve its quality of life it first addresses immediate needs such as food, running water, basic medical services, electricity, and education. Once those needs are met satisfactorily, the country turns its attention to the other determinants of its quality of life, such as air pollution and other environmental matters."[18] And this shift, Goklany asserts, happened long before 1970.

Environmental historians have been reluctant to discuss this interpretation, in part because of the historian's natural distrust of books that promise "the real story" on anything but also because they see it as a mere "smokescreen" for Goklany's political agenda. To be sure, Goklany's bias is obvious: it would not have taken his membership in the libertarian Cato Institute, or

his appointment as assistant director in the U.S. Department of the Interior's Office of Policy Analysis under the George W. Bush administration, to foster suspicions that his real goal was to discredit federal environmental policy.[19] And yet it seems too easy to simply dismiss his argument as a political ploy, for at least one reason: one of Goklany's key assertions—that air pollution loads had declined before 1970—does contain some truth. In fact, Goklany could have made his case even more persuasive had he done his research more thoroughly. In the early 1950s, industry's investments in air pollution control technology already lay in the range of 100 to 400 million dollars per year, and there are strong indications that these sums increased massively thereafter; a 1966 estimate cites an annual amount of 850 million dollars.[20] But do these figures support Goklany's argument?

Air pollution measurements usually go along with an active regulatory program, and the postwar years were no exception. Regulatory agencies existed mostly at the municipal level, having grown out of the smoke abatement tradition of the Progressive Era. Staffed with mechanical engineers, many of them hired to fight the smoke nuisance and little else, they commonly saw smoke and other particulate emissions as their primary issue, often achieving notable reductions in this regard. But at the same time, these agencies were less interested in pollutants that were not visible or otherwise available to the senses—and this was not their only limitation. The powers of municipal authorities inevitably ended at the city limits, and attempts to reach beyond these boundaries produced meager results. County or state agencies might have done a better job, but their development was hindered by the advocates of the smoke abatement tradition. As a result, solid accomplishments within cities went along with weak regulation in suburban areas, small towns, and the countryside, but nobody was taking measurements there.

Thus, the decline of pollution loads during the 1950s and 1960s does not signal a healthy regulatory system. Quite the contrary: the decline of particulate emissions was no more than the last meager accomplishment of a regulatory system that had long passed its prime, having grown from the ingenious solution of the Progressive Era into an enduring burden hindering reforms. The burgeoning environmental sentiment made it crucial to move beyond smoke and soot, but the regulatory establishment was dragging its feet in this respect, not for lack of awareness but simply because its own distinct interests stressed other priorities. This makes the story of postwar air pollution control ill suited for an attack on federal prerogatives. The merits of federal involvement are really quite plain in retrospect, and it is misleading to see the work of federal officials from a post-1970 standpoint.

During the 1960s, most of their work was directed toward strengthening local-control programs, rather than harassing them with federal intrusions. Two years after the first major piece of federal regulation, the Clean Air Act of 1963, funds for local and state programs against air pollution had roughly doubled, thanks to a generous program of federal grants. Later on, federal authorities were working toward a strong turnout in hearings pursuant to the Air Quality Act of 1967, offering training and other kinds of support to civic groups in the fight against pollution. But in the end, these hearings did not help regional programs as much as federal officials had wished. By providing a forum for the outburst of environmental activism around 1970, they ultimately discredited regional cooperation, nourishing the call for federal supervision. Federal involvement was thus the result of a highly complex chain of events—so complicated, in fact, that businesspeople were among the prime advocates of federal air pollution control in 1970.

Interestingly, Goklany does not discuss any of these factors or even indicate that he sees them as relevant. He does not trace the sequence of events leading to the 1970 Clean Air Act, or discuss the potential and limits of state regulation, or assess the cooperative spirit of postwar air pollution control; in his narrative, change takes place mostly "through some agency or the other."[21] His "environmental transition" is a strangely anonymous process, an almost magical trend that seems to have had neither advocates nor adversaries. There is no room in Goklany's narrative for the different parties involved in air pollution control: experts, officials, businesspeople, and active citizens. But environmental policy does not automatically follow a preconceived course, let alone a predetermined course for the better—it is made, and remade, on a daily basis, subject to twists and turns that no model can truly anticipate. In other words, what Goklany ignores is the fact that environmental policy, like every policy, is made by people, not by anonymous "processes" or "transitions." It is ironic, if not revealing, that a libertarian has forgotten this.

The present work was finalized as the antienvironmental revolution accompanying the presidency of George W. Bush seemed to be in its last gasp. I shall refrain from commenting on this antiregulatory onslaught here, since others have already done so, with much greater authority. However, it seems worthwhile to point out that Bush's antienvironmental revolution, or his attempt at one, underscores one of this study's recurring arguments—namely, the persistence of specific national paths of political development. After all, this full-scale assault on the accomplishments of the environmental era was only the latest sharp turn in a turbulent history: since 1970, radical shifts between

aggressive policies and antiregulatory backlashes have been a hallmark of American environmental policy, so much so that William Ruckelshaus, the first director of the Environmental Protection Agency, spoke of a "pendulum" of environmental policy that swings constantly back and forth.[22]

European nations have followed the swings of this pendulum with a mixture of bewilderment and worry, pointing with pride to the solid and far less contested environmental regulations of European nations and, more recently, the European Union. Germans in particular have gotten used to looking down on the environmental record of their transatlantic partners, although this demonstrates little more than their short memory. As this book shows, the overall balance between the two countries since the late nineteenth century is really quite even. Around 1914, the best municipal smoke abatement program was in Chicago; but at the same time, no boilers were inspected more thoroughly for smoke emissions than those controlled by the Hamburg Society for Fuel Economy and Smoke Abatement. There was no German equivalent to the spectacular campaigns against domestic smoke waged in St. Louis and Pittsburgh around 1940. But then, the postwar reforms in the Ruhr area ultimately proved more sustainable than the U.S. smoke abatement tradition. To be sure, there are some exceptions where one country was generally ahead of the other one: due to the peculiar situation of Los Angeles, for example, the United States was quicker in controlling automobile exhaust, whereas German air pollution control was generally stronger in rural areas, the neglected side of the urban-centered American debate. But beyond this, one should be careful making generalizations about overall efficiency.

It is important to stress these diverse accomplishments, as they provide an antidote to the bias that frequently characterizes comparative studies. Fittingly, Samuel Hays notes in *Beauty, Health, and Permanence* that comparative studies often display "skepticism, even hostility, toward the more open and participatory political system in the United States and a greater admiration for the more closed and 'efficient' modes of decision making in Europe."[23] This book takes a different, more balanced approach: it focuses on the specific national conditions that shaped debates and decisions, assuming that a comparative perspective is better suited to highlighting these conditions than a focus on either country would be. In this approach, the purported "superiority" of European policies quickly looks dubious, at best. The German state may have been stronger and more autonomous than its American counterpart, but this was a burden as well as an asset, as the narrative will show, allowing officials to squelch a nascent debate about administrative reforms in the early 1900s, with severe consequences for the efficiency

of control. Conversely, the more open and participatory character of the American political system has had mixed merits, as well. The civic leagues of the Progressive Era virtually created municipal smoke abatement out of nothing, and they were crucial in making it effective. But in the postwar years, the more open U.S. system allowed industrialists to influence policy to an extent that was probably unthinkable in Germany. Clearly, the issue is not whether one country enjoyed superior conditions, but rather what each country made of them.

National paths of political development, or "national styles of regulation," as they have come to be called, are one of those things that are more often assumed than actually studied. As a result, a tacit notion has slipped into discussions of "national styles of regulation" that deserves careful scrutiny: the notion of a "natural" path of political development, a "one best way" of regulation that suits the conditions of a particular country in the best way possible. For example, David Vogel argues, in his study of environmental policy in Great Britain and the United States, that "each nation does exhibit a distinctive regulatory style, one that transcends any given policy area," and that, as a result, "the characteristics of a political regime" define policy processes across the board.[24] In contrast, the present book argues for a more differentiated approach to national styles of regulation. On the one hand, it takes note of a host of national characteristics that are well known to students of either Germany or the United States: the important role of civic associations in American municipal politics and the weakness of Germany's civil society; the pride of German officials and the antistatist sentiment among German engineers; the declining legitimacy of the American business community during the 1960s; the campaign style of American politics and the greater amount of continuity allowed by the momentum of the German bureaucracy. On the other hand, this book also gives good reason to doubt naive essentializations about "national styles." For example, many studies of American environmental policy, including Vogel's, emphasize the antagonistic relationship between industry and regulatory agencies. However, the following narrative shows that for some sixty years, cooperation between businesspeople and regulators was in fact a hallmark of the American approach; indeed, a comparison between Germany and the United States in the 1950s would have found that America, not Germany, was the global custodian of cooperative air pollution control. As for Sturm Kegel's concept of "air pollution cooperatives," there is little doubt that they would have been declared a typical feature of the German approach if they had been successful. In reality, however, Kegel's idea never had a chance. Obviously, national styles of regulation do not determine a certain "best path" of development;

at best, they narrow down a choice between different approaches. Every national style of regulation is really a pluralism of possibilities.

It is important to emphasize this multitude of possible "national paths," as it aids understanding of the surprising efficiency of cooperative arrangements during the age of smoke. Throughout history, cooperative modes of regulation were usually at their best when they competed with a different, more confrontational approach; conversely, they were in danger of sclerosis when no alternative was in sight. For example, the rise of smoke inspection depended strongly on previous experiments with strict prosecution and fines. After prosecution had produced bitterness all around and little in the way of abatement, all sides embraced the less confrontational smoke inspection approach and sought to make it effective in order to forestall a return to fines and court proceedings. Likewise, the success of cooperative rule-setting within the VDI Clean Air Commission depended strongly on the threat of a state-centered alternative and on the fact that the federal government had reserved the right to ignore inadequate rules. Further, the lack of alternatives was clearly important for the decline of cooperative air pollution control in postwar America: why should industrialists strive to advance forcefully on the clean air front if cooperation was really the only realistic approach? Successful cooperation, then, seems to depend strongly on realistic alternatives, and it is important to see the cozy rhetoric that usually accompanied cooperative air pollution control in this light: if cooperation worked, it did so not because industrialists were nice people, but rather because they wanted to prevent a shift to less attractive policies.

The phrase "national styles of regulation" evokes notions of a holistic perfection, but environmental policy, and probably every policy, was far messier. For example, the reform of German air pollution control during the 1950s did not follow a grand design; it was a series of small steps, each contested, which ultimately produced a surprisingly enduring regulatory style. Likewise, the invention of the smoke inspector was originally a local solution for Chicago, propagated by the City Club of Chicago after consultation with Lester Breckenridge, a professor of engineering at the University of Illinois. It took numerous adaptations of the Chicago approach in other cities, and the failure of antismoke activists to develop a better strategy, for smoke inspection to become America's national style of environmental policy. At their inception, then, regulatory strategies are often improvised approaches, based on impromptu decisions made with nothing even vaguely resembling a blueprint for reform; they become national styles only after being replicated over time and in several places. National styles of regulation, as described in this book, are simply sets of practices that have gathered momentum.

Of course, this definition is to some extent based on the peculiarities of the topic. Decisions about air pollution control were mostly local and regional in both the United States and Germany before 1970; national legislation on these issues was weak in Germany and virtually nonexistent in the United States until far into the postwar years. And yet the importance of administrative routines should not be underestimated. In fact, the strength of bureaucratic routines emerges as one of the hidden forces of environmental history in this study—and one with ambivalent merits. It took some thirty years for the smoke inspection tradition to make possible the spectacular campaigns of St. Louis and Pittsburgh; but after that, it took another thirty years before the tradition was abandoned in favor of an approach that met the demands of the environmental era. "It is the unrelenting, day-by-day attention to detail that brings success," Raymond Tucker, the key figure of the St. Louis campaign and perhaps the best-known smoke inspector of all time, declared in 1941.[25] The age of smoke thus illustrates a classic dilemma of environmental policy: a good control program has momentum, but momentum makes it difficult to adjust to new challenges.[26]

I argue for a more nuanced and open understanding of national styles of regulation, analyzing the set of conditions that influenced policies in both countries, but emphasizing that these conditions in no way predetermined the course of events. While national styles of regulation have enormous momentum, they are not impervious to change. National styles of regulation are collective by nature, depending on the behavior of countless officials, experts, businesspeople, and citizens; and yet they leave room for courageous initiatives that open up new perspectives. With the words Ernest Renan famously used to describe French patriotism, national styles of regulation might be termed a "a daily plebiscite": a national routine that depends on certain political, social, and economic conditions and that may change, sometimes within a matter of days, as society itself changes.[27]

The conclusion of this book discusses whether the environmental revolution was really necessary in order to make air pollution control effective. While many environmentalists may find that question dubious, if not heretical, it seems unavoidable if the achievements of pre-1970 air pollution control are no longer ignored. Was it really necessary to abandon the smoke abatement tradition entirely in the United States and to begin the environmental era with a new set of policies and practices? Was there a chance for a more evolutionary process like that in Germany, where the more successful features of nineteenth-century regulatory traditions survived the outburst of environmental sentiments? Again, the goal here is not to depict one

country as generally superior, but rather to learn about both by comparing their divergent responses to similar challenges. National styles of regulation depend on a host of preconditions, many of which are semiconscious, at best. Making these preconditions clear, and subjecting them to intensive scrutiny, is instrumental for making wise environmental decisions.