THE POLLUTION of the first industrial revolution led to serious environmental degradation in many parts of the United States in the two decades preceding the Civil War. Many industries discharged foul, sometimes toxic, solid, liquid, and gaseous wastes and loud, repetitive, mechanical noises and vibrations into the surrounding air, water, and land. These emissions blackened air and water and disturbed ecosystems wherever rivers were dammed for power, wood or coal burned to power production processes, and slaughterhouses, mills, workshops, manufactories, mines, and smelters established. They also sparked the first significant wave of industrial pollution litigation in American history. Complaining of “noisome,” and “noxious” stenches, smokes, dusts, and “smuts,” poisonous and corrosive fumes, “corruption” of streams by “foul admixtures,” “tremendous noise and pounding,” and similar problems, people living near offensive businesses turned to the courts for compensation for the damages industrial pollution inflicted on their homes, farms, businesses, and families. They also sued for injunctions to stop the businesses from continuing to pollute.

This article examines the case law generated by this litigation in order to explore how people made sense of the environmental problems caused by the explosive growth of the textile, lumber, iron, meatpacking, railroad, and machine tool industries before the Civil War. The article considers the conflicted nature of American pollution beliefs as they are revealed in forty-six pollution-related nuisance cases decided in Massachusetts, New York, New Jersey, Pennsylvania, California, Illinois, Ohio, and Texas, from 1840 through 1864. By bringing together two largely separate literatures—environmental history and the legal history of nuisance case law—the essay will provide insight into the difficulty Americans had coming to terms with the increased scale and new forms of industrial pollution caused by technological innovation and growth in this early, formative era of rapid economic change.
Despite the ecological and civic importance of industrial pollution in the first half of the nineteenth century, environmental and business historians have been slow to examine it. Indeed, as several recent review articles have noted, until the 1990s, little in-depth, systematic research was published on any aspect of industrial pollution in any period of American history. In the last several years a number of books and articles finally appeared that address this lack. However, most of these publications concern industrial pollution problems in the late nineteenth or twentieth centuries, not the first half of the nineteenth century. Only a few deal in any sustained way with the pollution associated with the first industrial revolution, and, for the most part, these works focus narrowly on environmental change and problems in a specific city, district, or river valley.

In comparison, legal historians have paid a great deal of attention to the history of early and mid-nineteenth-century nuisance law. They have studied this subject through the lenses of the history of legal doctrine and social and economic history, however, not environmental history. As a result, their work provides a confused, contradictory, and incomplete perspective on American society’s response to the problem of industrial pollution during the first industrial revolution. Their conflicting analyses are part of the great debate that gripped the legal history field during the last three decades about whether judges changed common law doctrine during the first industrial revolution in ways that promoted economic development by privileging the rights of industrial entrepreneurs relative to plaintiffs.

Until recently, most who studied early nineteenth-century nuisance law argued that the courts largely abandoned the traditional nuisance doctrines that had once protected people against the environmental harm inflicted on them by the business activity of entrepreneurs. To promote economic growth, judges replaced old nuisance doctrines with new ones that left people affected by pollution and other industrial nuisance problems at the mercy of a capitalist class bent on maximizing profits. Deeply influenced by the work of Morton Horwitz, these historians disagreed only about such relatively minor points as when this shift took place and what doctrines played key roles in the transition. A few dissidents argued that the courts in some states interpreted nuisance doctrines in ways that were much less favorable toward industrial defendants. Their work, however, focused primarily on the second half of the nineteenth century and had little impact on mainstream legal history until the late 1990s.

Then, in a book published in 1996, William J. Novak turned the mainstream interpretation on its head. Arguing that “nuisance law was one of the most important regulatory tools of the nineteenth century American state,” Novak contended that the courts—rather than abandon traditional, pro-plaintiff nuisance doctrines—turned them into a “potent weapon” for controlling a wide range of industrial polluters. Declaring that the courts “at mid century remained quite willing to issue injunctions, grant damages, and throw people in prison for fouling community health and environment,” he argued that the urban industrial environment was “well regulated” by “a deeply rooted American tradition of police and regulatory governance vital to social and economic development.”
In 1997, in another major piece of revisionist legal history, Peter Karsten gave the debate a further twist. Like Novak, Karsten argued that nineteenth-century common law was much more supportive of business regulation than mainstream legal historians realized. However, he contended that the ancient common law traditions America inherited from the British actually favored business. Rather than sustain a regulatory tradition as Novak claimed or overturn it as the mainstream historians contended, judges in many states created a humane new “jurisprudence of the heart” composed of novel doctrines that protected the rights of workers and other parties vulnerable to various harms inflicted by business interests. While disputing Novak’s conclusion that nuisance law was at the center of this new regulatory jurisprudence, Karsten generally supported the idea that the courts often used their power to limit the right of business to pollute, describing many nuisance cases in which judges imposed injunction or damage awards on business defendants.10

This article will step away from this increasingly confusing debate. Rather than approach nuisance law from the perspective of a legal historian trying to understand the evolution of the common law, I will examine it from the perspective of an environmental historian who is interested in how people made sense of industrial pollution problems in the past. I have found that when one focuses narrowly on those lawsuits that specifically concerned industrial pollution and analyzes them from the perspective of environmental history, the historiographic muddle created by the legal historians’ conflicting interpretations resolves in an illuminating way. A clear, though still complex, picture emerges in which the contradictions in the nuisance case law turn out to be a signpost of the difficulty the courts had coming to terms with the environmental consequences of industrialization and technological innovation in areas undergoing rapid social and economic change. The courts adjudicated cases involving pollution from the traditional, stench emitting industries that had long been considered per se “nuisance” industries very differently than those involving pollution from the new manufacturing and railroad industries. The conflict reveals the trouble judges had applying a precedent-based common law system to the unprecedented environmental impacts of the industrial revolution. More important, it reveals how deeply held, pre-industrial cultural beliefs about pollution and the nature of material nuisance constrained the court’s response—and by extension American society’s response—to the environmental degradation generated by a rapidly evolving industrial system.

STENCH POLLUTION AND TRADITIONAL INDUSTRIES

NINETEENTH-CENTURY Americans sued industrial polluters under the common law of nuisance, a body of judge-made law that originated in the English courts during the late Middle Ages. Summed up by the legal maxim, sic utere tuo ut alienum non laedas, “so use your own so as not to injure others,” nuisance law restrained property holders from using their property in ways that interfered with the right of neighbors to enjoy the use of their property. The common law allowed
individuals as well as governments to take legal action against nuisances. Public nuisance doctrine authorized government authorities to use the state’s police powers to fine or imprison property holders for or enjoin them from using their property in ways that injured the rights of many people in a community or neighborhood. Private nuisance doctrine gave individuals two other rights of redress: the right to sue for monetary compensation for the injuries they personally suffered as a consequence of another property holder’s activities, and the right to sue for injunctions to stop the other from continuing to engage in the activities that caused the injury.11

At first glance, the *sic utere tuo* principle would seem to have constituted a bright, uncomplicated legal standard for protecting individuals and communities from industrial pollution. It assured all property holders, no matter how small, that they had an inalienable right to enjoy their property without interference from other property holders. The doctrine made any injury to a plaintiff actionable, as long as the plaintiff could prove that he or she had suffered a “material” harm as a result of the defendant’s activity. If the plaintiff could prove this, courts were supposed to find in the plaintiff’s favor.12 The courts traditionally held that material harms to property pertained to damage to the physical features deemed necessary to the owner’s physical and economic enjoyment of the property—i.e., injuries that infringed, for example, on the owner’s right to breath wholesome air, to be free of excessive noise, or to enjoy natural light. They did not consider owners to have a right to be protected in the enjoyment of their property’s more ephemeral aesthetic qualities such as natural beauty.13 The “necessary” physical and economic property injuries were, however, precisely those that plaintiffs claimed they suffered when defendants discharged stenches, smokes, noxious fumes, water pollution, or loud noises and vibrations that physically damaged their buildings, nauseated their families, drove away their tenants, killed their crops or livestock, prevented them from operating their mills properly, or inflicted the other physical and economic harms that led them to file suit.

Despite the seeming clarity of this rule, the history of industrial pollution litigation between 1840 and 1865 is complicated. The *sic utere tuo* doctrine was not supplanted by other, more pro-business doctrines, as mainstream legal historians would have us believe. Instead, as Novak contends, it continued to play an important role in the adjudication of nuisance cases. The courts consistently applied it in only one area during this period, however: to pollution emitted by what I am calling the “traditional” nuisance industries. Defendants in these cases operated breweries and distilleries, slaughterhouses, bone-boiling and fat-melting establishments, and other businesses that processed animal wastes, like soap- and candle-making concerns and tanneries. I am labeling these trades the traditional nuisance industries because they were deeply rooted in American life, having arrived with the first colonists. The foul smells that led the colonists to consider them material nuisances resulted from the decay of animal urine, manure, offal, blood, spent distillery grains, and other organic wastes that such businesses discharged into water or onto land. They also emanated from the foul smokes and vapors emitted into the air when bones, fats, and offal were boiled,
melted, or otherwise processed into soap, neat's-foot oil, glue, and other products. They also came from the odiferous chemicals used to tan animal hides into leather.

Americans had a long history of using nuisance law to defend themselves from this kind of industrial pollution. Acting on the principle embodied in the *sic utere tuo* maxim, colonial governments passed ordinances requiring the owners of slaughterhouses and other nuisance business to clean their premises and forbidding them to toss their wastes into adjacent streets, street drains, and streams. They also used their police powers to separate the traditional nuisance industries from people living in densely settled parts of towns, villages, and cities by relegating those industries to peripheral locations. To institutionalize the principle of separation, several colonial governments enacted laws that authorized municipal governments to regulate the location of nuisance industries. Elsewhere, colonial and early national town and state governments protected communities against egregious industrial stenches through public nuisance actions, using their police powers to force businesses that violated the norm of separation to shut down and relocate to less densely populated areas.14

As Novak points out, these colonial land-use regulations were the earliest examples of land-use zoning in the United States. The problem was that cleanliness regulations were difficult to enforce, while using zoning to separate people from these trades worked poorly in rapidly growing towns and cities. In order to stay accessible to their customers, business needed to locate close to the center of town—within walking distance, before the advent of street cars. As time passed and population increased, the area of dense settlement expanded. Residents moved into the outlying districts where noxious businesses already were located, in effect violating the principle of separation, putting themselves into direct contact with the disgusting odors these businesses emitted. This led to problems even before the industrial revolution, repeatedly forcing colonial governments to rewrite nuisance industry zoning regulations.15

The conflict intensified during the early nineteenth-century as the pace of industrialization quickened and urban populations grew. In the 1840s and the 1850s there was a burst of private litigation against slaughterhouses, rendering establishments, and the like in New York City.16 Published reports of public as well as private litigation against these businesses also can be found in other places undergoing significant growth, including Philadelphia, Oneida, New York, and several towns in Massachusetts.17 The migration of urban populations into peripheral areas occupied by nuisance industries stimulated much of this litigation. The following analysis is based on a study of fifteen such cases, a third of the forty-six cases that constitute the research on which this article is based.

The case reports reveal the powerful hold that the traditional *sic utere tuo* nuisance doctrine continued to have on judges in this period. One of the earliest suits was *Catlin v. Valentine*, a landmark 1842 New York case that showed that judges in this period were willing to put the rights of plaintiffs far ahead of defendants. The suit pitted a group of property owners against a defendant who was constructing a new slaughterhouse in an undeveloped area in Manhattan ripe for residential construction.18 The plaintiffs won an injunction that prevented
the defendant from erecting his slaughterhouse. Although the defendant appealed, winning a modification of the injunction allowing him to continue constructing his building, the new injunction still forbade him to use the building for the operation of a slaughterhouse. His subsequent application for a complete dissolution of the injunction failed. Declaring that the operation of a slaughterhouse would constitute a prima facie nuisance in an area in which people were building houses, the New York Court of Chancery, citing English precedents, invoked language associated with the *sic utere tuo* doctrine: “To constitute a nuisance, it is not necessary that the noxious trade or business should endanger the health of the neighborhood. It is sufficient if it produces that which is offensive to the senses, and which renders the enjoyment of life and property uncomfortable.”19

The New York chancellor further justified his decision in terms that explicitly addressed the problem that underpinned so much of the litigation against the traditional nuisance industries: the neighborhood change caused by the migration of residents into the relatively undeveloped peripheral districts once considered to provide proper locations for nuisance businesses. The chancellor declared that there was “no real necessity that such an offensive business should be carried on in this part of the city, where many valuable dwelling houses of the best kind are already erected and are continuing to be built.” Instead, it made so much more sense to operate such trades “in the unsettled parts of New York or where property was less valuable,” where there was no need for the owners to go to the expense of trying to abate their nuisances. His statement reflected the principle at the core of the zoning approach to dealing with industrial nuisances: Noxious businesses should be confined to undeveloped peripheral areas where their stenches would not affect many residents or valuable buildings.20 Following this principle, most of the judges who adjudicated traditional nuisance cases between 1840 and the early 1860s imposed injunctions that compelled the owners of slaughterhouses, rendering plants, and similar businesses to shut their plants down or relocate to a more peripheral area. As the statistics in Table 1 show, there were only a few exceptions to this pattern, and they had little impact on the evolution of nuisance doctrine as it applied to the traditional nuisance industries during this period.21 In the vast majority of traditional nuisance cases, the courts found against polluters by following very traditional principles of nuisance law.

Several decisions forced defendants out of neighborhoods in which they had been located for decades. The case reports echo with the anger and defiance expressed by defendants caught in the jaws of the *sic utere tuo* doctrine when cities expanded. *Commonwealth v. Van Sickie*, an 1845 Pennsylvania public nuisance case, pitted a defendant who had been in business in a relatively remote location for over thirty years against newcomers to the area. The state accused him of allowing stenches and filth from the hundreds of pigs he kept to consume his distillery wastes to foul the air and the water of the Schuylkill River. The case report lays bare the outrage Van Sickle felt when he was prosecuted for carrying on a legal business in a location that had been too remote to cause any trouble until residents began encroaching into the area. He argued that it would be a
gross injustice for the state to give the rights of newcomers precedence over the rights of a person who had been in business in the same location without complaint for far more than twenty years—the length of time customarily required to establish a prescriptive right to continue a stench emitting business.\textsuperscript{22}

The state charged that his pollution caused discomfort and nausea as well as lowering property values in a large area in the northwest corner of Philadelphia into which several “public institutions of great importance” and growing numbers of residents had recently moved. Van Sickle responded that not only was his distillery business “essential to the city,” but that it “had been in existence long before the erection in the neighborhood of the edifices” the state claimed his business was injuring. He further pointed out that “there were and had been from time immemorial a number of smaller piggeries” in the same area to which the stences could also be attributed. Declaring that he had always carried on his establishment “with as much regard to cleanliness as its character permitted,” he concluded that the place where he conducted it “had been for so long a period devoted to this and similar purposes, as to give those who had more recently moved into it no just right of complaint.”\textsuperscript{23}

Similar sentiments were expressed by the defendant in Commonwealth v. Upton, an i856 case in which the state of Massachusetts indicted the owner of a slaughterhouse in Fitchburg for creating “unwholesome smells” that “infected the air, to the actual injury of persons dwelling, or passing along the public highway, near to the place where it was conducted.” Here again, the defendant claimed a prescriptive right to operate his business, despite the stench, because he had been slaughtering animals in that location for more than twenty years. He had begun the business when the area was vacant, decades before the highway was established and people began constructing dwellings in the vicinity. He argued that he had “thereby acquired an absolute right” to his business “in the same place and in the same manner as before; and that no proceeding against him on the part of the public for doing so can be maintained to abate it as a nuisance.”\textsuperscript{24}

In both cases, the courts completely dismissed the plaintiffs’ prescriptive rights arguments. Invoking the principles at the core of public nuisance law, the Pennsylvania Supreme Court declared that people had a right to live in and travel through neighborhoods where their noses would not be assaulted by terrible smells that might carry disease, even death. “No man or body of men has a right to occupy a portion of [the city of Philadelphia] and declare that shall be a Golgotha. Persons owning property in city lots, are entitled by right to healthy air, and to a use of the public highways unimpaired by any adjacent nuisance.” The Massachusetts Supreme Court said the same: “For it is a positive rule of the law, as reasonable as it is firmly established, that no length of time will legitimate a nuisance. ... The public health, the welfare and safety of the community, are matters of paramount importance, to which all the pursuits, occupations and employments of individuals, inconsistent with their preservation, must yield.”\textsuperscript{25}

The New York and Pennsylvania courts also dismissed defendant claims to a prescriptive right to pollute in private nuisance cases. For example, in Brady v.
Weeks, an 1848 case in which a group of property owners in Manhattan sued the owner of a slaughterhouse, a New York Supreme Court judge declared: "As the city extends, such nuisances should be removed to the vacant ground beyond the immediate neighborhood of the residences of citizens. This, public policy, as well as the health and comfort of the population of the city, demand." In the 1849 case Howard v. Lee, in which the proprietor of a large hotel sued a soap maker, the New York Supreme Court declared that it was proper to prohibit such noisome businesses from being operated in densely settled parts of cities, "on the broad principles that all trades which render the enjoyment of life and property uncomfortable, must recede with the advance of population and be conducted in the outskirts of the city or in the country."

The courts were emphatic that plaintiffs in private nuisance suits need not prove a nuisance threatened public health or welfare to win injunctions, much less win damages. All they had to show was that a defendant's stenches caused discomfort. As the Superior Court put it in its Howard decision, "It is well settled, in cases of this kind, that it is not necessary [that] a trade should be so injurious to health as to constitute a public nuisance, in order to have it restrained." What mattered was whether the nuisance was "offensive to the senses, making the enjoyment of life uncomfortable." Judges also made it clear that plaintiffs need not prove that the defendant's business was the source of the stenches causing them so much grief, even if there were other businesses nearby that the defendant could claim were the real source of the problem.

This kind of reasoning turned the courts into the arbiters of all kinds of clashes between residential real-estate developers and the traditional nuisance industries. Judges used these principles to justify forcing slaughter houses, rendering establishments, and the like out of relatively undeveloped, peripheral districts, not just the most crowded, densely settled parts of major cities. Ironically, such relatively remote areas were, as a large fat-melting operation in New York City pointed out in its defense, places that were supposed to be "suitable and proper" for the traditional nuisance industries, because they were "in a great degree unimproved," and already contained a "large number" of slaughterhouses and other offensive establishments, some of which no doubt had been sited there in response to earlier campaigns to clear the nuisance trades out of more densely settled central districts.

An extreme application of the zoning doctrine was the decision in Smith v. Cummings, an 1851 Pennsylvania case that pit a wealthy family against a bone-boiling establishment involved in the manufacture of glue and fertilizer. Although the plaintiff appears to have lived in a remote, thinly settled, still rural part of Philadelphia in an area where people were constructing summer homes, the judge stated that that his court would adopt the zoning principle articulated in Brady v. Weeks that declared that rendering establishments in a "densely populated district" were a per se nuisance that "should be removed to the vacant grounds beyond the immediate neighborhood of the residences of the citizens." Though the judge ruled for the defendant in this case on technical grounds (having to do with how the plaintiff worded her charge against the defendant), he did so
reluctantly in an otherwise strongly pro-plaintiff decision in which he invited the plaintiff to amend her bill and obtain her injunction. The judiciary’s willingness to impose harsh measures on such businesses testifies to the revulsion the traditional nuisance industries inspired in society and the extreme actions accepted by the American public as a legitimate method for protecting people and their property from their awful stenches.32

While most of the reported traditional nuisance cases involved injunctions, four case reports concerned stand-alone damage suits. While offering a less radical solution to the plaintiffs’ complaints, these damage cases also illustrate the legal system’s deep antipathy to the traditional nuisance industries. The defendants—a slaughterhouse, a fat-boiling business, and two tanneries—lost every decision, at trial and on appeal.33 In two of the cases, the appellate judges reached their pro-plaintiff decisions despite questioning the juries’ findings of fact and expressing deep reservations about the materiality of the nuisance or the defendant’s liability.34 Their refusal to reverse these monetary awards bears further witness to how deeply rooted the sic utere tuo doctrine was—how impervious it was to the pleadings of defendants, at least where the traditional nuisance industries were concerned. For judges, juries, and the public as a whole, damage awards and injunctions were a legitimate way of dealing with the conflict sparked by traditional forms of industrial pollution. They readily imposed these costly punishments on the owners of such businesses, without worrying that this might be unfair to the defendants or that it might slow down economic growth.

**POLLUTION IN OTHER INDUSTRIES**

THIS ANTI-POLLUTER, pro-plaintiff stance was not the norm, however. As Table 1 shows, the courts dealt with disputes involving newer kinds of pollution very differently. Of the forty-six cases examined for this study, thirty-one involved smoke, noise, stench, toxic fumes, or water pollution emitted by what I am calling the “new” industries associated with the industrial revolution—such as textile mills, iron mills, steam-powered sawmills, machine and other metal-working shops, mines, smelters and the like, and the steam locomotives, engine houses, and depots of the newly emerging railroad industry. These sectors experienced explosive growth between 1840 and 1865, sparking the transformation of the U.S. economy from small-scale, handcraft production in which pollution was not a significant problem, to large-scale, mechanized, mass production that created serious air, water, and noise pollution problems. Courts in all seven of the states included in this study rendered decisions in pollution cases from such sources.35

In cases involving the emerging industries, judges rarely ignored or rejected the arguments defendants made to justify their right to continue to operate and pollute. Instead, they often adopted the defendants’ defenses as their own operative legal rules. They gave preference to defendant rights and a host of procedural and standing concerns that worked to the favor of defendants, sweeping aside the plaintiff rights that were so carefully and deliberately protected in decisions involving stenches from traditional nuisance businesses.
Table 1: Cases and Outcomes, 1840-1865

<table>
<thead>
<tr>
<th>TYPE OF CASE</th>
<th>Pro-polluter</th>
<th>Anti-polluter</th>
<th>Mixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional nuisance industries</td>
<td>3</td>
<td>10</td>
<td>2</td>
<td>15</td>
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<td>private nuisance</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>public nuisance</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>New manufacturing and transportation industries</td>
<td>20</td>
<td>8</td>
<td>3</td>
<td>31</td>
</tr>
<tr>
<td>mill/shop/manufactory</td>
<td>13</td>
<td>3</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>gas house</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>railroad</td>
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<td>1</td>
<td>5</td>
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<td>3</td>
<td>28</td>
</tr>
<tr>
<td>public nuisance</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

The different approach is especially apparent in decisions in which judges accepted the defendant's claim that its pollution was not inflicting a material injury on the plaintiff. Defendants almost always disputed plaintiff claims that their pollution caused material harm, whether in the traditional nuisance or the new industries. The courts dismissed these assertions when they were made by the owners of slaughterhouses, rendering businesses, and other traditional nuisance industries, repeatedly holding that plaintiffs need show only that the defendants' stenches had caused them "discomfort or inconvenience" to justify the imposition of an injunction or the award of damages. They did the opposite in most of the new industry cases, however, accepting the defendants' contention that that they had caused the plaintiffs no material harm.

The reasoning in these decisions reveals that it was difficult for plaintiffs to convince judges—and juries—that the water, smoke, noise, and stench pollution problems emitted by new industries were as serious a threat to their physical comfort and property values as the stenches emitted by the traditional nuisance industries. In some cases, plaintiffs foundered in their efforts to establish that they were suffering material injury for much the same reason that environmentalists today run into problems trying to convince courts and legislatures that toxic chemicals and greenhouse gases pose significant threats to human health and global climate: they lacked credible means to "prove" that smoke and noxious emissions were causing problems. They also found that the
courts were raising the bar on the material nuisance standard, insisting that they prove that they had suffered "irreparable" damage, rather than mere inconvenience and discomfort.

*Tichenor v. Wilson*, an 1849 New Jersey case, exemplifies the challenge plaintiffs faced. James Tichenor, a farmer, sued the Passaic Chemical Works for an injunction, alleging that the foul smelling gases and vapors it emitted were killing the vegetation on his farm and corroding all the metal tools and fixtures on his premises, as well as nauseating his family and neighbors. In an emotional appeal preserved in summary form in the case report, Tichenor begged the court to impose an injunction, asserting that he would be forced off his farm if he could not obtain relief.36

The owners of the chemical works denied all of his accusations. They denied that the fumes were noxious or deleterious to the health of the plaintiff and his neighbors, contending that—to the contrary—they had been informed that Tichenor and his family enjoyed "as good or better health than they did before said works were established." They also insisted that they had not heard a single complaint from anyone in the area that the works were injurious to health. Although they admitted that their air emissions were corrosive to metallic substances, they denied that this had caused any serious injury to Tichenor's property. They also claimed that they had no knowledge that Tichenor and his family had "ever been disturbed in their rest at night, or put to any inconvenience at any time by reason of such gases or vapors." Pointing out that the waste gases were "valuable" and that it was in their interest to prevent them from escaping and that in fact a large part of their business involved the sale of products formed from condensed forms of the gases, they argued that they were not polluting, except when an "unavoidable accident or tempest or similar causes beyond the control of those having charge of said works" made it impossible for them to prevent emissions. Though they had relocated the plant from New York City, the defendants also buttressed their claim that they were not causing a nuisance by pointing out that similar works operated elsewhere in the United States as well as in foreign countries, "sometimes in the midst of populous cities," "without interruption" by people complaining of pollution. They also asserted that their factory was actually increasing property values in the neighborhood, especially Tichenor's, which was closest. And they emphasized that the plant was giving large numbers of workers employment and producing valuable products used in the textile and other industries.37

Tichenor could not overcome this counter testimony. Reviewing the conflicting evidence, the chancellor of New Jersey refused to grant an injunction. Departing from the discomfort and inconvenience standard being enforced in New York and Pennsylvania in traditional nuisance cases, the chancellor concluded that Tichenor had not proven that he suffered a material nuisance serious enough to warrant an injunction: "An injunction should not be granted unless a clear case of nuisance and of *irreparable injury* be made out. The case, as it appears from the bill, answer and affidavits, fails, I think, in these respects." Noting that Tichenor had allowed the works to be operated for three and a half years before
bringing suit, the chancellor added that it “would seem that no very serious consequences to the complainant or his property” would result from leaving him to “the ordinary processes of law (i.e. a damage suit) in cases of alleged nuisance.”

Seneca Lincoln, a farmer in Norton, Massachusetts, ran into similar problems trying to prove that toxic fumes and water pollution from a zinc and copper smelter and paint factory were damaging his soil and crops. Lincoln went much further than Tichenor in trying to prove his case, obtaining an affidavit from a university professor, a scientist with expertise in plant biology, who testified that he had performed experiments that showed that grass from Lincoln’s land had absorbed copper from water pollution discharged by the smelter. Unfortunately for Lincoln, the defendant, the Taunton Copper Manufacturing Company, brought in a competing expert, also a university scientist, who testified that he had performed experiments that showed that copper frequently existed in plants naturally. To compound Lincoln’s problems, the court refused to accept the testimony of non-expert neighbors who had testified that the smelter was inflicting similar damage on the crops and soil on their lands. The trial judge appointed a three-man panel of auditors to investigate the facts and bring clarity to the conflict, but they, too, could not reach agreement on the validity of Lincoln’s complaint. In a divided report, two of the three auditors concluded that he had not suffered a material nuisance. As a result, the judge refused to grant the injunction. The Massachusetts Supreme Court affirmed this decision on appeal.

Other plaintiffs had trouble convincing judges and juries that the smoke and noise pollution emitted by steam-powered factories and large metal forges inflicted enough discomfort and property damage to warrant the imposition of an injunction or the granting of damages. For example, the plaintiffs in League v. Journeay, an 1860 Texas case, could not prove that the smoke and the “great noise” generated by the defendant’s steam-powered machinery “materially diminished” their health, their comfort of life, or their property values. They charged that the smoke and noise from the defendant’s steam-powered machine shop made their neighborhood “impure and unhealthy” and “impaired the health of those who were permanently exposed to it,” causing “nervous irritability” that retarded their recovery when they were sick and endangered their lives. They also charged that the smoke blackened their homes inside, reducing their property values. The defendant countered by mustering physicians as witnesses who testified that the smoke “was not injurious to health, and did not retard the recovery of sick persons of the neighborhood.” His witnesses also contended that the pollution, while making the neighborhood less valuable as family residences, did not make their property less “intrinsically” valuable, since it could become more useful for business purposes. The jury concluded that there was no material nuisance and refused to grant an injunction. On appeal, the Texas Supreme Court agreed, concluding that the evidence was so conflicting that it was “impossible” for it to disturb the jury’s verdict.

The owner of a paper mill ran into a different kind of trouble. He needed to prove that the defendant he was suing, the owner of a textile mill, was responsible for discharging the water pollution that drove him into court. Although the judge
and even the defendant agreed that the plaintiff's business had been affected by an increase in the level of pollution in the water he used to manufacture paper, the defendant was able to avoid taking the blame for this by producing employees who testified that his mill had not changed the quantity or the quality of the materials it used to dye cloth in years and so could not possibly be responsible for the problem. Pointing to the other mills and factories and a hospital on the stream, Mill Creek, the defendant insisted that they were surely the true sources of the increased pollution. He also claimed a prescriptive right to pollute by virtue of having operated his mill for more than twenty-one years. After surveying the conflicting evidence, a Philadelphia Court of Common Pleas judge refused the injunction. Although judges routinely imposed injunctions on slaughterhouses and other traditional nuisance businesses regardless of how long they had been in business or whether there were other such establishments nearby, this judge was not prepared to treat the owner of a textile mill in the same way.41

Some plaintiffs were up against more than conflicting testimony and a higher standard for proving the existence of a nuisance than they would have faced had they been suing a traditional nuisance business. They also faced a difficult conceptual and legal challenge: They had to convince judges and juries, who identified the very idea of nuisance with the stenches emitted by slaughterhouses and rendering plants, that the smoke, loud noises, toxic fumes, and water pollution emitted by businesses that were nothing like the traditional nuisance industries nevertheless could and should be defined as legally actionable nuisances. The courts had a tradition that dated back to the late Middle Ages in England of treating slaughterhouses, bone-boiling establishments and the like as per se or prima facie presumptive nuisances. They had virtually no experience, however, dealing with the pollution emitted by the large water and steam powered factories, textile mills, and other industries that the industrial revolution brought to the fore. The lack of precedent had a major impact on the way some judges and juries adjudicated such cases.

The California Supreme Court dealt with the precedent issue in a particularly dismissive way in Bear River Co. v. York Mining Co., the first case to concern a pollution problem created by the gold mining industry in the state's history. It pitted two gold-mining companies against each other over the diversion and pollution of water that both parties used in mining and washing ore. Justice Burnett began his decision by remarking on the legal dilemmas posed by the lack of common law precedent as well as statute law to guide the resolution of conflicts involving the state's infant, but booming, gold-mining industry. He then discussed, at considerable length, the legal principles the courts could use to help them decide the disputes concerning the diversion of water. He concluded, after a detailed consideration of the existing case law, that the law protected downstream users from diminishment of the quantity of water by upstream users. Then—in a single sentence with no explanation—he declared that with regard to the plaintiff's complaint about the defendant's pollution of the water, "the injury should be considered as an injury without consequential damage." In other words, he simply wrote off the water pollution problem as a non-problem.42
The issue was a bit more complex for the New Jersey chancellor, when he decided several cases involving pollution from steam-powered factories in favor of defendants in the mid-1850s. He had to contend with the pro-plaintiff precedents set in nearby New York in the cases involving the traditional nuisance industries discussed above. What he said in two decisions sheds additional light on the difficulty some jurists had in seeing a parallel between the per se nuisances generated by the traditional nuisance industries and the less obviously harmful environmental effects generated by other kinds of business.

_Davidson v. Isham_, an 1852 injunction case, was the final published decision in a series of lawsuits mounted by the neighbors of a large steam powered coffee, spice, and drug grinding mill in Jersey City. The plaintiffs charged that the mill caused terrible discomfort, annoyance, and injury to them, their tenants, and their property by emitting stenches “of the most disgusting and nauseating character” and by constantly jarring and shaking one of their houses so badly that the walls cracked and everything inside rattled continuously. The defendants denied everything. As a result of the conflicting testimony, the original plaintiff, Charles F. Durant, found it impossible to prove that he and his family and tenant had suffered a material nuisance. He failed to secure an indictment for public nuisance from the county grand jury and was denied damage awards by two trial juries. When he sued for an injunction (while the second damage suit was proceeding), the chancellor refused to grant one unless the jury hearing the damage suit agreed he had suffered a material nuisance and awarded damages.44

After this debacle, a group of Durant’s neighbors filed still another injunction suit. This resulted in the _Davidson v Isham_ ruling, in which the chancellor again refused to grant the injunction unless the court that was hearing the second damage suit (then on appeal) ruled that Durant had suffered a material injury and made a damage award. This time the chancellor explicitly addressed the question of whether a business like the defendant's could be held responsible for creating a nuisance. Acknowledging the parallels between the _Davidson_ case and _Catlin v. Valentine_, the landmark case in which the New York Court of Chancery imposed an injunction on a slaughterhouse in a part of Manhattan undergoing residential development, the New Jersey chancellor distinguished between the two, declaring that in contrast to the slaughterhouse in the _Catlin_ case, the defendant’s mill was not “was not prima facie a nuisance, though carried on in a densely populated city.” He allowed that there “may be circumstances where even the noise of a steam engine may become a private nuisance, and its use, on that account, be restrained by the court,” but his phrasing was so qualified as to suggest that he personally thought this to be unlikely.46

The chancellor took up the issue up again in much more depth in 1856 in his decision in _Wolcott v. Melick_. The complainants, owners of six “moderate sized but handsome dwellings” in a still relatively undeveloped part of Trenton, sued for an injunction to stop the defendants from constructing a large, steam-powered, three-story brick factory to be used to manufacture agricultural implements. The chancellor reversed the decision of a lower court to grant the injunction, on the grounds that courts had no right to enjoin businesses for anticipated nuisances,
only actual nuisances. He then spent nine pages justifying his decision to treat these defendants differently from the Catlin defendants and others whom other judges had stopped from constructing slaughterhouses and other offensive businesses in neighborhoods experiencing residential development.47

Comparing the noise and smoke generated by steam-powered factories to the annoying flies a small grocery store might attract or the noise made by shoemakers using hand tools in a shoe shop, the chancellor declared that it was not the duty of equity courts to enjoin every business that caused inconvenience and property damage to its neighbors. Although he acknowledged that the courts previously had enjoined the construction of a variety of businesses that generated foul stenches, not just slaughterhouses as in the Catlin case but also a “brew house, glass house, lime kiln, dye-house, smelting house, tan pit, chandler’s shop, or swine sty,” he declared that “not a precedent has been found where the court has interfered to prevent the erection of a building to prosecute a manufacturing enterprise similar to the one the defendants propose to establish.” Pointing out that the defendants’ business was a lawful one, just like factories that existed “in all our large towns where manufactories exist to any extent,” even in “the very centre of our cities and villages, with dwelling-houses all around them,” he reiterated that “there is no instance, to my knowledge, where they have been held a nuisance. He concluded with an answer to his own question: “Is the court to assume that the ordinary running of a twenty horsepower steam-engine, driving lathes and planing machines, will be such an annoyance to the neighborhood as to justify the court enjoining the carrying on such a business in the neighborhood of half a dozen dwellings? I think not.”48

There was more to his decision. He also noted that the area was well-suited for large-scale industrial development, with the depots of some railroads and a canal nearby. He discussed the economic advantages of permitting the defendants to establish their business. Though he admitted that the factory would prevent the area from continuing to develop as a middle-class residential neighborhood, he argued that the proliferation of steam driven factories would increase property values more than the construction of small hand shops and tenement housing. The bottom line, however, was that he did not think the noise and smoke that would be emitted by the defendant’s factory (and the others he expected to be established) were real problems.49

Other decisions echo this view. Judges hearing other steam-engine pollution cases pondered the question of how bad a noise had to be to constitute a material nuisance. In a classic statement in Bell v. Ohio & Pa. RR Co., a case concerning (in part) the noise generated by a steam-powered locomotives and railroad machinery and the hustle and bustle at a train depot, Allegheny County District Court Judge Hampton articulated the relativistic, generally pro-defendant view that more and more courts would adopt, a view that ultimately would lead to development of a reasonable-use standard of liability for nuisance that was quite different from the traditional sic utere tuo standard: “What degree of annoyance will constitute a nuisance, must always depend upon the special circumstances of every case. Certain sounds would be considered nuisances by some, and music by others. As,
for instance, the chiming of church bells, the blowing of horns or trumpets, the lowing of cattle, the sound of the forge hammer, the whistle of the steam-engine, and the sound of the drum and fife. ... It is not every annoyance that is ‘unlawful and tortuous,’ indictable or actionable, and more especially is that the case in towns and cities, in these modern times of progress and improvement....[E]quity will not interfere in case of a nuisance, except to prevent irreparable injury.”50

Notice how Hampton segued seamlessly from the chiming of church bells and the lowing of cattle to the sound of the forge hammer and the whistle of the steam engine. This kind of thinking, which reflected life in an earlier era when a solitary blacksmith would labor at a forge, did not speak to the objective reality of the noise and clamor emitted by the many trains arriving and departing and being switched at urban freight and passenger depots or by the huge banks of forges operating in locomotive factories, steel and iron mills, and other large-scale factories that began to proliferate during the industrial revolution. It does, however, tell us something important about the mind-set of the judges and juries deciding industrial pollution nuisance cases at this time. While judges continued to embrace the traditional assumption that stenches from slaughterhouses and rendering plants were prima facie material nuisances, most were much less open to the idea that the noise and smoke emitted by steam-powered factories and railroads were real problems that caused actionable annoyance and discomfort.

For Hampton, the “special circumstances” the courts had to consider when determining whether a pollution problem was a material nuisance included whether plaintiffs had suffered an “irreparable injury.”51 The “special circumstances” also included consideration of whether plaintiffs had slept on their rights by waiting too long to file suit.52 Finally, Hampton said courts also must consider whether the defendants possessed a corporate charter that authorized them to operate their business without explicitly requiring them to abate their nuisances.53 Most important, argued Hampton, the courts had to consider whether an injunction would slow the course of economic development. Employing the economic cost-benefit reasoning of the balancing doctrine, a doctrine that would become much more common later in the century, Hampton expressed concern that if he allowed the injunction in the Bell case to stand, it would create a precedent that would lead to future decisions that would throttle Pennsylvania’s transportation industry and “stop all machinery of every description, driven or propelled by steam ... and restrain the use of coal, as fuel, because of the intolerable annoyance occasioned by its smoke.” That was totally unacceptable and required that courts adopt a much looser standard for establishing the existence of a material nuisance: “It should be borne in mind that we live in an age and a country of progress and improvement. New branches of business are constantly spring up on every hand.... The unparalleled increase and improvement in agriculture, commerce, and manufactures, demand increased facilities in travel and transportation. These, and many other considerations, require the modification of former rules, and judicious application of the expansive principles of the common law to the altered condition of the country and the necessities of the public. ... [W]hat would at one time have been held to be
a nuisance, might not, and probably would not, be so considered now. Private interest and comfort must often yield to the public necessity or convenience."

In short, like most other judges at this time, Hampton viewed the air, noise, and water pollution emitted by mills, manufactories, mines, and railroads from a mind-set that made it easy to doubt the validity of the plaintiffs' complaints that they were being materially injured and equally easy to accept the defendants' assertions that they were doing nothing wrong. He and others based their decisions on assumptions that drew a sharp line between the pollution generated by traditional nuisance businesses and by the manufacturing and railroad businesses that proliferated during the industrial revolution. On one side of the line were prima facie nuisances, the pollution that was by custom and tradition automatically assumed to be a legally actionable material nuisance. On the other were the new forms of industrial pollution, problems that were not ingrained in common law precedent—or these people's minds—as serious enough to be treated as material nuisances.

This perceptual division cut deeply through the common law, leading judges to treat procedural and technical issues in the same bifurcated way as they treated the substantive issue of what constituted a material nuisance. Traditional English and colonial American common-law procedural rules and customs were poorly designed for handling the nuisance litigation stimulated by the industrial revolution. Among other things, the rules defined who had standing to sue and be sued in restrictive ways, limiting the right to sue to the individuals who owned the property injured by the nuisance and requiring them to file suit against the owner of the property creating the nuisance, and limiting the rights of individuals to join together to sue. The rules also obligated plaintiffs to press their private nuisance suits in two different sets of courts: Damage suits were to be taken to law courts, where claims for monetary damages would be heard by a judge and jury, while injunction suits were to be taken to equity courts to be decided by a chancellor alone. Plaintiffs were to file their damage suits individually rather than jointly; and they were to file first in a court of law for damages, so a jury could pass on the question of whether they had suffered a material nuisance, before going to the equity courts for an injunction, unless they were filing for a preliminary injunction, in which case they were expected to post bonds to indemnify defendants for the losses they would suffer from the injunction if no nuisance was proven in the damage case.

It appears to have been relatively easy for the courts to enforce these complicated rules in the pre-industrial era, when there was little private nuisance litigation. Problems increased during the industrial revolution, however, when the number of suits began to multiply, growing numbers of lease-holders became involved in litigation, neighbors began to join together to sue polluters rather than suing individually, and more and more plaintiffs wanted immediate injunctions, even if they could not afford to pay the bond required to file for a preliminary injunction or the cost of often lengthy legal proceedings in a law court.

The situation gave defendants the opportunity to argue for the dismissal of injunction and damage suits on a variety of technicalities. The rules provided
grounds for them to claim that injunction suits had been filed in error because the plaintiffs had not followed proper procedure by filing for damages first in a court of law, or had improperly joined together in a suit rather than suing individually. The spread of tenantry and sub-tenantry opened up additional avenues for technical problems. Some defendants argued that the cases against them should be dismissed because the plaintiff did not have standing to sue, because he or she was not the owner of the property injured by the nuisance but the tenant or subtenant of the owner. Other defendants argued for dismissal on the grounds that they themselves were not the appropriate target of the suit, either because they were leaseholders—or because they were the owners, not the tenants or sub-tenants who actually operated the polluting business.

What is interesting is how judges embraced these claims when finding for defendants in the cases involving pollution from manufacturing businesses and railroads, while ignoring or expressly rejecting them when finding for plaintiffs in traditional nuisance cases. Judicial attitudes toward these procedural issues meshed seamlessly with their ideas about what constituted a material nuisance and what extenuating circumstances relieved defendants of liability for nuisance. Ingraham v. Dunnell, an 1842 Massachusetts case, exemplifies the intricate way that judges often wove technical and substantive rationales together to stack the deck against plaintiffs.

The owner of a cotton mill sued the owner of a calico print works for an injunction to stop him from polluting the water of the brook from which he drew the water used in the production of his cotton cloth with noisome "washes, drugs, and dyestuffs" that impeded the operation of his machinery, discolored his cloth, and sickened his workers. The justices of the Massachusetts Supreme Court dismissed the case on the basis of a convoluted argument involving standing and the assumption that the plaintiff should have sought relief first in a court of law, as well as on the idea that courts had a duty to foster economic growth. They argued that equity courts could not interpose themselves in such cases unless the plaintiff had first proven, to the satisfaction of a judge and jury in a court of law, that he had suffered a material injury serious enough to warrant the award of damages. Monetary compensation might, they argued, be all he deserved. Equity courts should not intervene "unless it can be shown to be necessary to prevent future mischief," which they contended would have to be so serious, so "irreparable," that it would require "the application of power to prevent."

The justices further argued that the plaintiff, the man who owned the cotton mill, had improperly sued for an injunction, because he had not included his brother, his tenant and the actual operator of the mill, as his co-plaintiff when he filed the suit. When the plaintiff asked to amend his bill to include his brother, the justices refused to allow him to do so, on the grounds that the brother's lease had since expired, which made it unnecessary for him to join the suit as co-plaintiff. The justices linked these technical reasons for refusing the injunction with what they considered their duty to avoid interfering with economic growth: "A court of equity is extremely unwilling, as Eden remarks, to interpose without a trial at law, especially where the alleged nuisance consists in the exercise of a manufacture. ... More especially it may be added, where the
works complained of are of great value, and a perpetual injunction might be ruinous.”

This sort of reasoning was common in cases where judges found for defendants. It persisted in New York even after 1848, when the state abolished separate equity courts and streamlined its rules of civil procedure to allow plaintiffs to combine injunction and damage suits and made the rules for filing cases more flexible to accommodate the interests of tenants and sub-tenants. Significantly, however, it seems to have lived on only in cases relating to pollution from mills and factories. It is not evident in cases concerning slaughterhouses and the like. The case law resulting from the reforms further illuminates the bifurcated juridical mind-set that led courts to favor plaintiffs in traditional nuisance cases while favoring defendants in the new industrial pollution cases.

New York merged its equity and law courts and simplified its rules of civil procedure in order to reduce the inefficiency, confusion, and cost associated with the dual system and outmoded procedural rules. In a key 1848 test case, Cornes v. Harris, the New York Court of Appeals, the state’s highest court, made it clear that courts were no longer to require plaintiffs to prove that they held title to the property affected by a nuisance. The case, in which a family in the upstate town of Sangersfield sued the owner of a slaughterhouse for damages, resulted in a $250 damage award. The defendant appealed, arguing that the plaintiff had failed to show that he owned the premises in fee and had failed to follow various procedures in how he filed the suit as required by the common law assize of nuisance. The Court of Appeals rejected this argument in sweeping terms that showed how much flexibility the reforms were supposed to afford plaintiffs:

If this is the old assise (sic) of nuisance, there is no doubt but that the declaration is insufficient and the judgment erroneous. But if it is an action on the case [as opposed to a writ of nuisance], it is equally clear that the declaration is sufficient and the judgment right. ... It is not necessary to mention the form of the action in the commencement of the declaration; and if the pleader gives it a wrong name it will do no harm. The form of the action is determined the matter set for in the declaration, and not by the name by which the plaintiff may give it.... Now as the writ. It is not a matter of any importance how the defendant came into court—whether he was served with a writ, capias, or declaration; or whether he appeared voluntarily without process of any kind. It is enough that he appeared and pleaded to the declaration in an action of which the court had jurisdiction.

However, in Ellsworth v. Putnam, an 1852 case concerning water pollution from a sawmill, the New York Supreme Court repudiated this flexibility. In a ruling that reinforces the impression that judges viewed traditional nuisance cases very differently than cases involving pollution from mills, factories, and other new industries, the court re-embraced the old strictures of traditional nuisance law. The plaintiff, a farmer, sued a sawmill for damages and an injunction to stop it from discharging oil and sawdust into a brook the plaintiff used for drinking and other household purposes and to water his cattle. The defendant objected on the grounds that the plaintiff had not used the proper terminology when filing suit. Judge C. L. Allen agreed with defendants. “The remedy by writ of nuisance is not encouraged here,” he declared. “It has always been viewed with disfavor by
our courts." Accordingly, the plaintiffs must continue to follow traditional
nuisance law rules: "If the party will have a writ of nuisance, or an action in the
nature of it, he must follow the course marked out by the law. A departure from
the strict ancient practice will not be permitted." 67

In sum, the people who sued industrial polluters between 1840 and 1865
presented the courts with an opportunity to extend the compass of the sic utere
tuo doctrine to a broad range new industrial pollution problems. The courts did
not take advantage of this opening, however. Judges could have applied the same
legal doctrines and standards they so readily used to enjoin and impose damages
the traditional nuisance industries in cases against the rapidly proliferating
machine shops, iron factories, textile and sawmills, smelters, gold mines, and
other enterprises that were becoming so important in the American economy:
But they did not do so at this time. They did not make the conceptual leap of
connecting the new industrial smoke, noise, odor, toxic fume, and water pollution
problems with the old, familiar stench problems generated by the traditional
nuisance industries.

These findings shed fresh light on the conflict among legal historians
regarding the degree to which the courts supported business interests in nuisance
cases involving industrial pollution. Both sides of the debate are right, albeit in
limited ways. Novak and Karsten are correct when they argue that individuals
and communities wielded nuisance law as a land-use regulation tool, although
only in so far as slaughterhouses, bone-boiling and fat-melting establishments,
and other traditional nuisance trades were concerned. The courts took decisive
action against these sorts of businesses, imposing damage awards and
injunctions, forcing them out of densely settled urban areas to protect plaintiffs
from their stenches and other forms of pollution, with little regard for the cost to
the defendants. However, mainstream legal historians like Kurtz, Horwitz, and
Provine also are correct in their contention that nuisance law was bent during
this period to serve the interests of the entrepreneurial class. The courts did little
to stop textile mills, machine shops, sawmills, chemical works, and similar
businesses from polluting. By refusing to hold these sorts of defendants to the
rigorous sic utere tuo standard to which they held traditional nuisance industries,
they removed what could have been a serious impediment to industrial growth
and supported the rise of an increasingly important segment of the
entrepreneurial class.

As Table 1 indicates, there were only a few exceptions to this pattern. Among
these, the decisions that most closely resembled traditional nuisance decisions
involved public nuisances. I located the reports for three public nuisance cases
that concerned pollution from businesses outside the traditional nuisance
industries, including an iron manufacturer, a coal yard, and a chemical works. 68
What is interesting is that all three decisions assumed the materiality of the
nuisance without discussion, even though they concerned non-traditional forms
of pollution, and summarily dismissed the defendants' efforts to build technical
defenses. This suggests that once a grand jury indicted the owners of a business
like a chemical plant or iron factory for creating a public nuisance, trial and
appellate court judges were much less likely to accept the technical defenses put forward by defendants than in ordinary private nuisance suits. Perhaps public prosecutors rode community opposition to the pollution into court, using it, as much as any legal argument, to persuade judges as well as juries to ignore defendants’ defenses and convict them of committing a public nuisance.

The courts also tended to treat the pollution emitted by gas companies differently than other manufactories, but only up to a point. The process by which gaslight companies converted coal, pitch, and other substances into manufactured gas generated such awful smells, smokes, and water pollution that a consensus developed, in England as well as the United States, that the pollution was a per se nuisance, just like the stenches emitted by traditional nuisance businesses. Judges sometimes included gas house cases in their lists of businesses that had been held to be prima facie nuisances. The case law examined here was entirely related to damage suits, however. While the courts were usually (but not always) willing to treat gaslight companies like traditional nuisance industries for the purposes of granting damages, people did not take the next step and sue for injunctions to compel them to abate their pollution or relocate, or at least there is no published record of anyone doing so at this time.

Another exceptional case, First Baptist Church v. Schenectady & Troy RR.Co., ironically illustrates the persistent power of the old cultural values and attitudes even as it exemplifies, on another level, a departure from the norm. It was one of two lawsuits mounted by a church against steam railroads that were disturbing the church’s Sunday worship services and the only decision involving a railroad among those examined for this study that did not result in complete victory for the defendant. The decision in the other suit brought by this church exemplified the pro-defendant judicial thinking characteristic of the vast majority of decisions handed down in cases involving railroads and other new kinds of industrial pollution. The Troy case, however, was decided in favor of the plaintiffs on grounds that judges normally applied only in traditional nuisance cases.

The justices of the Rensselaer General Term Supreme Court heard the Troy case on appeal after a decision by a circuit court to award damages to the plaintiff. Using arguments that New York judges used to justify imposing injunctions and damage awards on traditional nuisance businesses, Justice Harris emphatically declared that the noise and vibrations the railroad emitted were material nuisances. Declaring that the *sic utere tuo* standard was a “great principle” that was “founded upon that great law of Christian charity which requires every man to do to others as he would have others do to him,” he reversed the pro-growth reasoning of so many “new” pollution cases and asserted that the proliferation of industrial corporations in the modern age necessitated that courts hold corporations to this traditional doctrine in order to prevent industrial development from ravaging the land with nuisances: “Where, as in this country, corporations are so multiplied and so extensively engaged in the various departments of business, to hold that they may, with impunity, do any act for which an individual would be amenable to justice, would result in the most pernicious consequences.”
What is telling about this case is not the justices' pro-plaintiff reasoning, however, so much as the amount of damages awarded. The circuit court judge who heard the case at trial directed the jury to find for the plaintiff. However, he instructed them to award only nominal damages. The jury rendered an award of just six cents!85 The defendant appealed on the question of its liability for damages, not the size of the award. Though the appellate justices made clear that they believed the defendant was indeed liable for damages, they could do no more than uphold the trivial amount of compensation granted by the trial jury.

This vanishing-small award is another example of the way in which the pollution generated by the new industries failed to register in people's minds as serious problems. Even though the trial judge and his jury recognized the relevance of precedents set in traditional nuisance cases, they did not consider the discomfort the plaintiffs suffered as a result of the noise and vibration emitted by the defendant's steam engines and whistles to be equivalent to the harm people experienced when they smelled the stenches emitted by slaughterhouses and other traditional nuisance businesses.

**CONCLUSION**

WHY WERE judges and juries—and by extension large segments of the American public—so strangely, dichotomously concerned about the environmental harms associated with traditional nuisance industries and blind to those associated with the newer, rapidly developing manufacturing, mining and smelting, and transportation industries? To the modern mind the latter forms of pollution seem at least as objectionable as, and often much worse than, slaughterhouse stenches. Why were they treated so differently back then?

Pro-business, pro-economic growth bias cannot explain this divided pattern, notwithstanding the emphasis that mainstream legal historians put on this factor in their analysis of nineteenth-century common law. Enthusiasm for economic and business development undoubtedly colored the thinking of many judges hearing cases involving the new industries, making it easier for them to think that the environmental problems about which plaintiffs complained were not serious enough to warrant the imposition of an injunction. Such bias is particularly evident in the relatively small number of decisions in which judges used explicit pro-growth arguments—such as the notion that an injunction in the case at hand would lead to future decisions that would stifle economic growth in the economy as a whole—to justify finding in favor of defendants. However, if this pro-business mind-set had really been determinative, it presumably would have affected the adjudication of cases involving the traditional nuisance industries, which also were growing vigorously at the time. Yet the era's enthusiasm for growth did not give much protection to businesses in this sector, no matter how large or modern. In Peck v. Elder, for example, the New York courts repeatedly imposed injunctions on the exceptionally large rendering operation constructed by the Butchers' Melting Association, even though it was located in a relatively remote part of the city near many slaughterhouses and other nuisance
businesses and was intended to centralize into one giant, modern operation the melting of the fat and tallow from all of the animals slaughtered in New York City. Although the large innovative business bitterly fought the efforts of its neighbors, the courts forced it to shut down.75

Nor can the contrasting patterns be explained by the revisionists’ argument that nineteenth-century common law was animated by a deeply rooted—or a newly emerging—belief that the courts had an obligation to regulate industrial development to protect workers and others negatively affected by its excesses. Like the mainstream view, this argument lacks the nuance needed to explain why the courts treated pollution emitted by certain industries one way and that generated by other industries another way.

Cultural theory suggests a different conceptual framework for explaining the dichotomies, one that draws attention to the role played by deep-seated public attitudes toward the environment in the evolution of nuisance law. Of particular interest is work done by cultural anthropologists, cognitive psychologists, and others working in the so-called postmodern vein, who examine how societies culturally construct and reconstruct their understandings of the natural world.76 In these scholars’ view, human beings do not make sense of the environment and environmental problems in a purely rational, “objective” way. Instead, preexisting systems of abstract knowledge (or “schemas”) mediate perception, structuring what people “know” about the environment, telling them how to distinguish “normal,” “natural,” and generally acceptable environmental conditions from those that are “abnormal” and unacceptable.77 These schemas serve as a “predefined system of symbolic understandings” into which people fit their experience of pollution and other environmental conditions.78 Because they are preexisting, they build a conservative bias into what people understand about their surroundings. People rely on them because they simplify and provide order to their experience of the natural world. They provide “tremendous cognitive economy” because they “direct attention to relevant information, guide its interpretation and evaluation, provide inferences when information is missing or ambiguous.”79

When we consider the two sets of cases from this perspective, the notion of a legally actionable material nuisance becomes a cultural construct that has relatively little to do with objective measures of environmental harm and a great deal to do with American society’s environmental cultural traditions and folk wisdom. As Adam Rome has shown, Americans did not develop modern understandings of and terms for air and water pollution until the late nineteenth century.80 The judges’ willingness to impose injunctions and damage awards on the traditional nuisance industries and extreme reluctance to impose them on the new industries suggests that their conception of material nuisance was the product of pre-industrial cultural schemas that evolved before large factories powered by coal-burning steam engines and producing or utilizing toxic chemicals became commonplace. These symbolic understandings were rooted in a era in which the truly horrible stenches of slaughterhouses and rendering businesses stood out in screaming sharpness against the ordinary stenches, smokes, and
liquid wastes coming from homes, churches, stables, stores, and workshops that had for millennia constituted the generally accepted sensory backdrop of everyday life. They framed a worldview in which the only sort of industrial emissions that most people "knew" were so abnormal as to constitute an intolerable material harm—that caused damage so bad that they obviously required state intervention—were those that were generated by the traditional nuisance industries.

The bimodal disposition of the cases also provides insight into the slow and contested process by which Americans began to make the shift from these pre-industrial understandings to more modern conceptions of the normal and abnormal impacts of business on air, land, and water. Plaintiffs challenged their society's pre-industrial definition of material nuisance when they argued that the smokes, fumes, noise, vibration, and water pollution of textile mills, sawmills, foundries, machine shops, chemical works, railroads, and other similar businesses were violations of the "normal" and "natural" every bit as unacceptable as the foul odors emitted by slaughterhouses and rendering establishments. They knew these emissions were intolerable from personal experience. By suing for relief, they attempted to redefine their society's schematic understanding of pollution, expanding the scope of the notion of a legally taboo "material nuisance" to include the air, noise, and water emissions of a wide range of businesses far outside the boundaries of the traditional nuisance trades. In so doing, they engaged defendants (and judges and juries) in a debate about the content and meaning of the material nuisance standard.

What is important is that in the vast majority of cases, judges found the most compelling arguments to be those that were aligned with traditional pollution beliefs and norms. In some cases, judges responded to the new industrial pollution suits in a way that appears, to the modern mind at least, to suggest they were in a state of psychological denial about the severity of the pollution problems associated with the new industries transforming the U.S. economy. They appear unwilling or unable to acknowledge the environmental destruction those industries caused. Some rewrote nuisance doctrine in their effort to maintain the conceptual categories set by their culture's schematic environmental understandings. They set a higher bar for defining the materiality of the nuisance when it came from a steam train, machine shop, mill, mine, or chemical works rather than from a slaughterhouse or bone-boiling establishment. They required permanent, irreparable damage to the plaintiff's property rather than mere discomfort and inconvenience. Or they justified allowing defendants to continue to pollute by citing technical problems with the lawsuits, doctrinal considerations, or other mitigating circumstances that they almost never allowed to affect their rulings in traditional nuisance cases.

In many other cases, however, the decisions seem to have been the product of the judge's lack of familiarity with the environmental impacts of the rapidly evolving technologies of industrial production, especially steam engines, large-scale metal smelting and forging, and the manufacture of toxic chemicals and their use in the textile and other industries. While a few judges rejected out of hand the idea that a new form of pollution represented an actionable nuisance,
many others seem genuinely uncertain as to whether the defendant's emissions reached the level of a material nuisance. They did not give automatic credence to plaintiff claims that chemical works and smelters emitted fumes so toxic that they killed crops and corroded metal farm tools, nor to plaintiff complaints that smoke, smells, or noise from a mill or machine shop were so disturbing as to drive down property values or harm their families' health or drive tenants away. Nor did they automatically believe defendants claims that their businesses caused no harm. Instead, they pondered the conflicting testimony of plaintiffs and defendants and their witnesses, which in some instances included physicians and university professors who offered diametrically opposing expertise regarding the harmfulness of the defendants' pollution emissions. Unable to resolve the contradictions, they concluded that plaintiffs had failed to "prove" that they had suffered material damage.

We now know, looking back, that the technological changes that underpinned the industrial revolution transformed heretofore normal and generally acceptable business smoke, noise, liquid waste, and stench emissions into environmental conditions that were not "normal," because they were so much more intense in scale and different in composition than that with which people were then familiar. This seems obvious to us now. It wasn't back then. As the decisions in the non-traditional nuisance cases show, the pace of technological and economic change far outpaced the evolution taking place in the cultural mind-sets and understandings by which people interpreted and made sense of the environmental repercussions of industrial development. It would take time for the old assumptions to loosen their grip enough for people intellectually to acknowledge the abnormality of the new industries' waste discharges and to accept that they could get so bad that they could reach the level of a material nuisance. The transition from traditional to more modern pollution beliefs had just begun. Not until the late nineteenth and early twentieth centuries would more modern understandings gain broad acceptance.

NOTES

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1. In this article, the term "industrial revolution" refers to the era of rapid industrial growth that began in the United States at the close of the eighteenth century and that was associated with explosive growth in the textile, boot and shoe, flour milling, lumber, iron, railroad, and machine tool industries and, more generally, with the rise of the factory system and the growing reliance on water and steam to power the production of manufactured goods. See, for example, C. Joseph Pusateri, A History of American Business (Arlington Heights, Ill.: Harlan Davidson, 1984), 120-42; Mansel C.

2. The cases were identified through a search of cases listed under “Nuisance,” “Water and Water Courses,” and “Municipal Corporations” in the standard index to American case law: American Digest, Century Edition: A Complete Digest of All Reported American Cases From the Earliest Times to 1896 (St. Paul, 1897). People sued businesses for creating a wide range of nuisances during this period, not just industrial air, water, and noise pollution. In selecting cases for analysis, I excluded those that did not explicitly refer to the defendant’s air, water, or noise pollution, including cases related to physical obstructions in roads, waterways, sidewalks, etc.; nuisances on residential property, such as residential privy vaults and defective sidewalks; one-time industrial catastrophes like accidents, fires, and explosions that did not involve ongoing environmental damage; and moral nuisances such as bawdy houses. I also excluded cases related to floods, stream diversion, and stagnant ponds caused by the damming of waterways for the establishment of watermills used in industry; environmental nuisances produced by farms and horse stables, unless they were associated with an industrial enterprise; and railroad cases in which the plaintiff did not explicitly complain about the defendant’s air, noise, or water pollution. Most of the cases were litigated in the four states located in the Northeast, the seat of the industrial revolution, with the largest number originating in densely settled, heavily industrialized New York City (New York: seventeen cases; Massachusetts: eight cases; Pennsylvania: eight cases; New Jersey: six cases; Ohio: two cases; Illinois: two cases; California: two cases, Texas: one case). Seven were public nuisance suits. Thirty-nine were private nuisance suits. Of these private nuisance suits, twenty-one were injunction suits, fourteen were damage suits, and three were suits for both injunctions and damages.


5. See, for example, the books by Cumbler, Muir, Raufer, and Steinberg listed above. An exception is Rosen, "Noisome, Noxious, and Offensive Vapors, Fumes, and Stenches," but it focuses narrowly on just one kind of industrial pollution, stench pollution. This current article is not the first to use the case law record to explore the industrial pollution problems associated with the industrial revolution. Both the Rosen and Steinberg pieces make extensive use of legal sources in order to take advantage of the descriptive material in the case law as well as, in the Steinberg book, to explore key political and legal conflicts over the exploitation, depletion, and regulation of water resources as well as the pollution of streams. Both rely on published legal records. Environmental historians also are beginning to explore archival records from this period. See Donna Rilling, "Intra-Industry Conflicts over Pollution Rights in Philadelphia, 1845-1865," unpublished paper, State University of New York, Stony Brook, 2002.


10. Karsten, Heart versus Head, 134-43. Karsten finds nuisance law to have been more pro-business than other parts of nineteenth-century common law (p. 134).


17. Commonwealth v Van Sickle, 4 Clark 104, 7 Pa. Law J., 82 Brightly N.P. 69 (Penn. 1845); Smith v Cummings, 2 Pars. Eq. 92 (Penn. 1851). Cornes v Harris, 1 N.Y. 223 (1848). Dana v Valentine, 46 Mass. 8; Commonwealth v Brown, 54 Mass. 365 (1847); Commonwealth v Upton, 72 Mass. 473 (1856).

18. Catlin v Valentine, 9 Paige 575, 575-76.

19. Ibid., 576-77, esp. 576.

20. Ibid.

21. Judges used the sort of substantive, pro-defendant reasoning that came into common use in cases involving manufacturers and railroads in two traditional nuisance cases, Dana v Valentine, 46 Mass. 8 and Dubois v Budlong, 23 N. Y. Super. Ct. 700. However, their arguments were not applied as precedent in other traditional nuisance cases during the period under study. See Kurtz, “Nineteenth Century Anti-Entrepreneurial Nuisance Injunctions,” 634-35, for a treatment of this case by a legal historian examining nuisance law from the mainstream perspective. In two other cases, Smith v Cummings, 2 Pars. Eq. 92 and Commonwealth v Brown, 54 Mass. 365, the defendants prevailed only because the plaintiffs made technical errors in the wording or filing of their lawsuits. The Smith case is treated as a “mixed” decision in Table 1 because, as discussed above, the decision was extremely pro-plaintiff in every other respect. The
other “mixed” case was People v Cunningham, 1 Denio 524, 43 Am. Dec. 709 (N.Y. 1845), a distillery case. The defendant was convicted of creating a nuisance and forced to shut down, but only after the prosecutors dropped the pollution (due to stench) part of the indictment.

22. Commonwealth v Van Sickle, 4 Clark 104, 82-84.
23. Ibid., 83-84.
27. Brady v Weeks, 3 Barb. 157, 159.
29. Ibid., 283. See also Catlin v Valentine, 9 Paige 575; Brady v Weeks, 3 Barb. 157 (N.Y. 1848).
31. Peck v Elder, 5 N. Y. Super. Ct. 126, 128. See also: Commonwealth v Van Sickle, 4 Clark 104; Commonwealth v Upton, 72 Mass. 473.
32. Smith v Cummings, 2 Pars. Eq. 92, 100-102.
33. Cornes v Harris, 1 N.Y. 223. Cropsey v Murphy, 1 Hilt. 126; Thomas v Brackney, 17 Barb. 654 (N.Y. 1851); Honsee v. Hammond, 39 Barb. 89 (N.Y. 1862).
34. Cropsey v Murphy, 1 Hilt. 126, 128; Thomas v Brackney, 17 Barb. 654, 659.
35. In contrast, reports of decisions in cases involving the traditional nuisance industries were published in only three states, New York, Massachusetts, and Pennsylvania.
37. Ibid., 200-202.
38 Ibid., 204-205, italics added.
41. Warren v Hunter, 1 Phila. 414 (Penn. 1853): 417. See also Ingraham v Dunnell, 46 Mass. 118, 126.
43. The various lawsuits generated two published case reports: Durant v Williamson, 7 N. J. Eq. 547 (1849) and Davidson v Isham, 9 N. J. Eq. 186 (1852). The other suits are mentioned in these reports.
44. Durant v Williamson, 7 N. J. Eq. 547, 554.
45. Davidson v Isham, 9 N. J. Eq. 186: 188-91.
46. Ibid., 189-91, italics added.
47. Wolcott v Melick, 11 N. J. Eq. 204, 66 Am. Dec. 190 (1856).
49. Ibid., 214-215. See also: Butler v Rogers, 9 N. J. Eq. 487 (1853).
51. Ibid.; italics in original. See also Middleton v Franklin, 3 Cal. 238, 241.
52. Bell v Ohio & Pa. RR Co., 25 Pa. 161, 171-74. See also Warren v Hunter, 1 Phila. 414, 415; Tichenor v Wilson, 8 N.J. Eq. 197, 204.
53. Bell v Ohio & Pa. RR Co., 25 Pa. 161, 177. This argument of the protection offered by a corporate charter played a particularly central role in railroad cases, because all railroads were chartered. See First Baptist Church v Utica & Schenectady RR. Co., 6 Barb. 313 (N.Y. 1848): 318; Hentz v Long Island RR Co., 13 Barb. 646 (N.Y. 1852): 656; Parrot v Cincinnati, Hamilton. & Dayton RR Co., 10 Ohio St. 624 (1858): 630. For a creative application of this sort of thinking to a steam-powered factory that did not have a corporate charter, see Call v Allen, 83 Mass. 137 (1861): 141-43.


56. On the issue of procedure, see, for example, Dana v Valentine, 46 Mass. 8: 12; Smith v Cummings, 2 Pars. Eq. 92: 102; Benner v Jordan, 2 Edm. Sel. Cas. 473; Middleton v Franklin, 3 Cal. 238: 239-41; Dennis v Eckhardt, 3 Grant Cas. 390 (Pa. 1862): 391-93; Ingraham v Dunnell, 46 Mass. 118: 124; Bell v Ohio & Pa. RR Co., 25 Pa. 161, 182: See also Kurtz, "Nineteenth Century Anti-Entrepreneurial Nuisance Injunctions," 635-37. On joint versus individual lawsuits, see, for example, Dana v Valentine, 46 Mass. 8, 12-13; Brady v Weeks, 3 Barb. 157, 160-61; Davidson v Isham, 9 N.J. Eq. 186 (1852): 189-90.


59. Ellsworth v Putnam, 16 Barb. 565, 569; Fish v Dodge, 4 Denio 311: 313-18; Brady v Weeks, 3 Barb. 157: 161. As these cases and those listed in note 58 indicate, the owners of traditional nuisance businesses as well as mill and factory owners tried to get judges to dismiss cases on these technical grounds.


61. Ibid., 125-126

62. Ibid., 126.

63. See, for example, Hentz v Long Island RR Co., 13 Barb. 646; First Baptist Church v Schenectady & Troy RR Co., 5 Barb 79; Dana v Valentine, 46 Mass. 8; Benner v Jordan, 2 Edm. Sel. Cas. 473; Middleton v Franklin, 3 Cal. 238; Bell v Ohio & Pa. RR Co., 25 Pa. 161.


65. Cornes v Harris, 1 N.Y. 223.

66. Ibid., 226-27. See also Brady v Weeks, 3 Barb. 157: 160-62.

67. Ellsworth v Putnam, 16 Barb. 565. See also, Hentz v Long Island RR Co., 13 Barb. 646. For more on the confusion and conflict that marked the state's efforts to reform its equity law, see Kharas, "A Century of the New Equity," and Friedman, A History of American Law, 342-43.
68. Commonwealth v Lyons, 1 Clark 497, 3 Pa. Law J. 167 (Penn. 1843); Commonwealth v Mann, 70 Mass. 213 (1855); Commonwealth v Rumford Chemical Works, 82 Mass. 231 (1860).


70. For example, Rhodes v Dunbar, 57 Pa. 274-275 (1868). See also Novak, People's Welfare. 217-20.

71. Cases in which plaintiffs won damages include Pottstown Gas Co. v Murphy, 39 Pa. 257 (1861); Carhart v Auburn Gas Light Co., 22 Barb. 297; and Ottawa Gas Light & Coke Co. v Graham, 28 Ill. 73, 81 Am. Dec. 263 (1862). However, there were two other cases in which the plaintiffs lost, Columbus Gaslight & Coke Co. v Freeland, 12 Ohio St. 392 (1861) and Ottawa Gas-Light & Coke Co. v Thompson, 39 Ill. 598 (1864). The Columbus Gaslight case, which is counted as a mixed outcome case in Table 1, shows that some judges were reluctant to treat gas house pollution as a per se nuisance. The Ohio Supreme Court reversed the trial court's award of damages. In an extremely confused and convoluted decision that prompted a dissent from one of the court's three justices, the majority held that there were limits to the *sic utere tuo* principle that severely limited the right of plaintiffs to recover damages in cases of this type. Ottawa Gas-Light & Coke Co. v Thompson resulted in a clear victory for the defendant on purely technical grounds. Without addressing the nuisance issue, the Illinois Supreme Court overturned a jury award on the grounds the plaintiff lacked standing to sue, because he was not the owner of the well polluted by the defendant.

72. First Baptist Church v Schenectady & Troy RR. Co., 5 Barb 79. The other case, First Baptist Church v Utica & Schenectady RR. Co., 6 Barb. 313, was appealed to the Washington General Term of the New York Supreme Court, while the Troy case was appealed to the Rensselaer General Term. The conflict between the two decisions was so stark that the compiler of the 6 Barb (Barbour's Supreme Court Reports) case reporter commented on it in a footnote in the *Utica* decision.

73. First Baptist Church v S. & Troy RR., 5 Barb 79, 82-87. Harris also rejected, one by one, all of the many technical defenses offered by the Troy defendant to justify a ruling that it was not liable. He dismissed the railroad's public nuisance defense, declaring that private parties could sue for relief from a nuisance that affected the public as long as they could prove they had sustained some "particular damage, beyond the rest of the community." He similarly rejected the idea that the defendant was protected by its corporate charter from liability for its nuisance. Railroad corporations, he declared, were only authorized to take land and operate railroads, not cause nuisances. He disputed the defendant's contention that the church had no right to sue to stop the noises that its congregates suffered, only the individual congregants did. The church, he observed, was a corporation vested with the power to represent its members in the enjoyment of their religious rights and property. He also scoffed at the defendant's argument that under traditional common law rules, corporations could not be sued, pointing out the fallaciousness of this contention, which if applied in contract law would mean corporations could not make binding contracts. Ibid., 85-90.

74. Ibid., 82. This made the case a mixed result case in Table 1.


76. An overview of the literature on which this conceptual framework is based can be found in David I. Kertzer, *Ritual, Politics, and Power* (New Haven, Conn.: Yale University Press, 1988), 79-84. My thinking about this was originally sparked by Mary Douglas and Aaron Wildavsky, *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers* (Berkeley: University of California Press, 1983), 29-48. For more on the postmodern approach to explaining how humans understand nature, see...

78. Ibid., 80.
80. Rome, “Coming to Terms with Pollution.”