Containment Narratives:
Legal and Literary Treatments of Pollution During the Victorian Fin de Siècle

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ABSTRACT

"Containment Narratives: Legal and Literary Treatments of Pollution During the Victorian Fin de Siècle" argues that smoke for the late Victorians was a proxy for an unarticulated anxiety about entropic degeneracy; this underlying unease, and not any direct reaction to the phenomenon as it was actually experienced by the senses, was what shaped legal and literary reactions to airborne pollution. In replacing miasma theory, which attributed disease to vapors emanating from discrete and ultimately containable sources of organic decay, the idea of pollution disrupted the longstanding view that airborne waste could be controlled with the suggestion that it was indefatigably expansive. This shift, and the disruption it occasioned, happened at a time rife with such analogous disruptions as advances in industry and biology, as well as the sudden emergence of new areas of inquiry within the social and natural sciences, which collectively destabilized numerous conceptual categories that had previously been relied upon for their immutability. The longing for permanence that resulted surfaced in both legal and literary discussions of smoke as a move toward narrative containment.

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TABLE OF CONTENTS

NOTE ON CITATIONS

In an attempt to declutter my prose, I have adopted the conventional abbreviations proposed in 1947 by Jay Finley Christ in *An Irregular Guide to Sherlock Holmes of Baker Street*:

BLUE	"The Adventure of the Blue Carbuncle"
BRUC	"The Adventure of the Bruce-Partington Plans"
CARD	"The Cardboard Box"
COPP	"The Adventure of the Copper Beeches"
HOUN	*The Hound of the Baskervilles*
LAST	"His Last Bow"
MISS	"The Adventure of the Missing Three-Quarter"
NAVA	"The Naval Treaty"
REDH	"The Red-Headed League"
REIG	"The Reigate Squires"
RESI	"The Resident Patient"
SIGN	*The Sign of Four*
SPEC	"The Adventure of the Speckled Band"
STUD	*A Study in Scarlet*
3GAB	"The Adventure of the Three Gables"

INTRODUCTION

When, in what would prove to be the last chronological installment in the Holmes canon, Arthur Conan Doyle has his otherwise impassive protagonist ardently compliment "good old" Watson for being "the one fixed point in a changing age," he betrays a late-Victorian longing for stability that by 1917 proved to be little more than a pipe-dream (LAST, Vol. 2, 1443). During the final decades of the nineteenth century, however, the myth that stability could be regained was very much alive. This longing for permanence surfaced in both law and popular literature as a move toward narrative containment, and especially so in discussions about airborne pollutants. Late Victorian society responded in telling ways, both legal and cultural, to the specter of airborne pollutants.

While this preoccupation can partially be explained as a reaction to the sensory impact that airborne pollutants had on the Victorians—the plumes of smoke spreading above England would have been difficult to ignore—the character of the legislative and literary expressions of that preoccupation give rise to at least two additional questions. First, how did legislators address the problem of airborne pollution, and why did the laws they wrote so clearly miss the mark? Second, how might these anxieties have contributed to the popularity of late-Victorian detective and Gothic fiction, two genres especially preoccupied with representations of pollution as a contagion? Because, concerned as they are with methodologies that are often applied in isolation, these two questions have not yet been asked in concert, doing so can prove uniquely informative. Indeed, exploring them in tandem, as I will do in the following chapters, suggests a common answer:

namely, that pollution for the late Victorians was a proxy for some unarticulated anxiety and that this underlying unease, and not any reaction to pollutants as they were actually experienced by the senses, was what shaped legal and literary treatments of pollution during the fin de siècle.

Articulating that anxiety as a concern about entropic degeneracy—and demonstrating the usefulness of tracing its expression in Victorian popular literature, legislation, and public policy—is the broad purpose of this project. To that end, it is helpful to first define entropic degeneracy, a term I use as shorthand for a particular species of conceptual disruption. In replacing miasma theory, which attributed disease to vapors emanating from discrete and ultimately containable sources of organic decay, the idea of pollution disrupted the longstanding view that waste could be controlled with the suggestion that it was indefatigably expansive. This shift and the disruption it occasioned happened at a time rife with other such disruptions. During Doyle's fin de siècle, contemporaneous advances in industry and biology, as well as the sudden emergence of new areas of inquiry within the social and natural sciences, led to the expansion and destabilization of numerous conceptual categories that had previously been relied upon for their immutability: psychoanalysis broadened the notion of the self to include the murky subconscious, orderly historical time was replaced by seemingly impenetrable geological time, and human biological exceptionalism was challenged by the suggestion of evolutionary commonality with lower species.

The conceptual relationship between entropy and degeneracy can be traced to the

earliest discussions about the former. While a number of scientists independently arrived at the first law of thermodynamics throughout the 1830s and 1840s, it was not until Rudolf Clausius articulated the law in 1850 that the idea began to gain traction beyond scientific circles. Clausius explained that, "[i]n all cases in which work is produced by the agency of heat, a quantity of heat is consumed which is proportional to the work done; and conversely, by the expenditure of an equal quantity of work an equal quantity of heat is produced" (qtd. in Sullivan 78). But while Clausius's adaptation of the law of conservation of energy to thermodynamic systems—the argument being that the total amount of energy in a closed system remains constant—was relatively straightforward, the second law of thermodynamics complicated the issue in a conceptually threatening way. As early as 1824, Sadi Carnot suggested that some calories available for generating work would be lost in any real process. Thirty years later, Lord Kelvin speculated that this loss was one of heat, leading Clausius to articulate a rudimentary understanding of entropy in 1865. Clausius dubbed this irreversible heat loss entropy, after the Greek word for transformation, defining it as the measure of the microscopic disorder within a system. His second law of thermodynamics posited that isolated systems spontaneously evolve toward thermodynamic equilibrium, or maximum entropy. Consequently, while the total amount of energy within a closed system would remain constant, that energy would gradually transform—or degenerate—from a usable form to a disordered, unusable form.

The second law was particularly troubling for some Victorians, who immediately began applying the rhetoric of energy conservation and dissipation to social concerns.

Where Darwin's theories raised the specter of the decline of individual organisms, the second law of thermodynamics threatened the degeneration of entire systems. As Tina Young Choi points out, "in spite of . . . reassurances that no energy was ever lost from the universe, the idea that the universe as a whole might be tending always toward a more dissipated state was troubling to many" (306). Sarah C. Alexander agrees, noting that "[m]ore than a descent from idealism, the second law of thermodynamics signaled for the Victorians the inevitable 'heat-death' of the universe" (100). Alexander cites an 1852 paper by Lord Kelvin, who famously concluded that "[w]ithin a finite period of time past, the earth must have been, and within a finite period of time to come the earth must again be, unfit for the habitation of man as at present constituted" (qtd. in S. Alexander 100). The physicist John Tyndall agreed, arguing that once thermodynamic equilibrium was achieved, the extinction of the species would surely follow.

Alexander traces the disturbing implications posed by the second law in late-Victorian slum novels, noting that this emerging science offered readers a way "to reify their social and economic values as natural law" by "replac[ing] the narrative of capitalist progress with an entropic narrative which emphasizes the paradoxical nature of capitalist economy in creating labor and waste" (S. Alexander 101). According to Alexander, Victorian authors and readers alike perceived the nonworking poor as the residue of work done within the economic system of the nation, thus analogizing the thermodynamic and the economic. But while Alexander's work ably explores the conceptual intersection between entropy and degeneracy in the context of human labor, a comparable inquiry in the context of pollution—another consequence of urban industrialization—has not yet

been attempted. My project speaks to this question by scrutinizing the perceived threat of entropic degeneracy in late-Victorian discussions about smoke through the lens of law and literature. As I explain below, I focus on law and literature because both disciplines use narrative to impose order on uncontainable and diffuse harms that are seemingly divorced from cause and effect.

Like entropy, pollution emerged as a conceptual category during the nineteenth century and was as deeply rooted in concerns about waste. While the relationship among entropy, degeneracy, and smoke has received little critical attention, Allen MacDuffie's recent article, "Victorian Thermodynamics and the Novel: Problems and Prospects," offers many useful insights into the subject of entropy and urban waste generally. According to MacDuffie, "the thermodynamic processes of energy conservation, transformation, and waste were intimately tied to built environments, especially in urban centers and factory towns ("Victorian Thermodynamics" 212). MacDuffie describes the second law of thermodynamics as forcing the nineteenth-century public to confront the waste that was generated in any transformation of energy, and goes on to claim that the principle, appropriately dubbed the entropy law, "forecast gloomy things about the fate of the universe [while] provid[ing] insight into the transformative capacities of energy, the limits on its use, the finitude of its supplies, and the waste products that necessarily accompany its deployment" ("Victorian Thermodynamics" 212).

It is hardly surprising that this preoccupation with energy and entropy would be especially pronounced in Victorian attitudes about the city which, "as both a center of industry and activity, and a location built and unbuilt by market forces, called for a

vocabulary that could express the intertwined economic and physical determinants that defined its patterns of growth and its relationship to the natural world" (MacDuffie, *Energy* iii). An inevitable side-effect of that growth was the proliferation of all species of waste, which became a frequently lamented problem for urban residents. While waste and disorder were perceived as the inescapable realities of life, it was hoped that their proliferation could be curbed through proper urban management. Those hopes were well founded: as the century progressed, the developing urban infrastructure became increasingly adept at mitigating the problem of solid waste. Devastating cholera epidemics in 1849 and 1854 and the Great Stink of 1858 prompted parliamentary action, which ultimately led to the successful modernization of London's sewage system.

A solution to the problem of airborne emissions, however, proved more elusive. Smoke had, of course, existed well before the nineteenth century; in fact, air pollutants had been a source of considerable concern since England's industrial boom some hundred years earlier. Eighteenth-century scientists, however, had linked harmful emissions to natural processes, blaming disease on miasma, a gas believed to be released by decaying organic matter. Areas containing the greatest amounts of decomposing biomass—including marshes, jungles, and cesspools—were deemed to be the most thoroughly contaminated. Indeed, miasma was considered so harmful that even a single breath of it was believed to cause the bodies of those who inhaled it to ferment. Smoke, on the other hand, was cast in the role of a salubrious disinfectant. Moreover, because especially miasmatic locations could be avoided or, it was believed, even neutralized through the proper application of smoke, miasma theory propagated the comforting fiction that

airborne toxins were not only a containable and finite phenomenon but also one that could be made harmless through human intervention.

It was not until miasma theory was debunked and replaced by pollution theory that smoke was recast as an airborne villain. As Dale H. Porter suggests in *The Thames Embankment: Environment, Technology, and Society in Victorian London*, pollution was recognized as an especially alarming threat during the latter half of the nineteenth century because of a gradual redefinition of both solid and gaseous waste from mere inconvenience to toxic hazard. But to say that smoke went from being seen as a disinfectant of airborne toxins to an airborne toxin itself is to tell only half of the story. Smoke did not just replace miasma as a toxin, it was perceived as an entirely different kind of toxin. This conceptual shift transformed the popular understanding of airborne waste from a disordered but containable phenomenon, into that of a mobile contagion capable of attaching itself to unsuspecting pedestrians as smog. And while miasma had been imagined as something that could be managed and contained, smoke was seen as perpetually expanding and entropic. As such, smoke served as a visible manifestation of entropic degeneracy: an uncontainable contaminant that could turn individual Londoners into uncontainable vectors of contagion.

This study examines late-Victorian efforts to contain entropic degeneracy through the propagation of legal and fictional narratives about industrial air pollution. I focus primarily on industrial emissions because, while domestic coal had for centuries represented a familiar source of heat and comfort for the English, the vast scale and rapid, chaotic expansion of industrial pollution throughout the 1800s made it uniquely

threatening, both literally and conceptually. Though a great deal has been written about smoke's economic and environmental effects, the importance that it assumed in the Victorian imagination as a metaphor for entropy has gone largely unremarked. I stage my inquiry at the interdisciplinary junction of law and literature because both disciplines can be broadly understood as analogous attempts to impose order through the proliferation of communal narratives. But while the suggestion that Victorian authors and legislators responded in narrative to the threat of disorder represented by pollution narratively is perhaps self-evident, a comparison of those narratives—popular fiction dealing with smoke on one hand and smoke abatement legislation on the other—has not been attempted thus far. Consequently, positioned as it is at the intersection of law and literature, the project offers a unique window into Victorian anxieties about entropic degeneracy.

The interpretive space carved out by the law and literature movement since it emerged as a separate critical discourse in 1973 with the publication of James Boyd White's *The Legal Imagination* is particularly well suited to serve as a staging ground for this kind of interdisciplinary discussion about airborne pollution. Broadly speaking, "the jurisdiction of both law and literature is the realm where language, story, and human experience meet" (Ledwon ix). More specifically, however, law and literature is better equipped than most other interdisciplinary critical frameworks to tackle the subject of Victorian pollution. When faced with visible effects of seemingly uncontrollable phenomena that threaten to fundamentally transform their physical environments—be it the proliferation of smoke during the nineteenth century or the loss of biodiversity due to

climate change during the twenty-first—humans react narratively, and the narratives they weave fall into two broad categories: the proscriptive and the descriptive, or the legalistic and the aesthetic. But while today's narrative artists can tell stories about climate change in any of a number of mediums, their Victorian counterparts focused their attention on literature. To apply the critical framework of law and literature to the subject of Victorian pollution, therefore, is to scrutinize proscriptive and descriptive narratives about the phenomenon in tandem, and thus to capture broader cultural anxieties about smoke.

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The foregoing pages briefly summarize the central concern of this project and the scientific and historic milieu within which it is set. Each of the following four chapters explores a particular juncture in the conversation about entropic degeneracy: the emergence of pollution as a conceptual category manifesting late-Victorian fears about entropic degeneracy, the restrictive effect of those fears on legal efforts to resolve the smoke problem, aborted attempts to make sense of the phenomenon in detective fiction and, finally, Bram Stoker's success in harnessing entropic degeneracy as an instrument of meaning-making in *Dracula*.

I begin Chapter One by tracing the changing attitudes in the popular understanding of airborne waste, arguing that the late-Victorian fetishization of smoke was a reaction to broader anxieties about entropic degeneration. While the English reliance on coal began well before the industrial revolution, consumption was largely concentrated in London and surrounding areas. The transportation of coal over land was cost prohibitive before the advent of the steam-engine, and so only the few coastal cities

that were both sufficiently developed to take advantage of coal energy on a large scale and close enough to its source could profit from it. By the time improvements on steam engine design during the late eighteenth century expanded both the availability and industrial applications of coal, it had been the dominant fuel in London for decades. Once these innovations became commonplace in cities like Manchester and Birmingham, the nation's cotton and gas industries boomed and annual coal consumption rose precipitously.

The speed with which the effects of the resultant industrial pollution spread beyond the capital made the phenomenon seem all-encompassing. Within a span of only a few decades, pollution cast so inescapable a blight on industrial towns as to pervade even the popular novels of the day, setting the smoky scene in Charles Dickens's *Hard Times* and Elizabeth Gaskell's *Mary Barton*, among others. Indeed, by the fin de siècle, the smoke nuisance was "not so much detracting from the ideality of the landscape, as physically dominating it" (Mosley 23). As it swelled in scope, the phenomenon became perceptively and psychologically oppressive, contracting "the visual worlds of those who were trapped" within it (Mosley 23). In Chapter One, I interweave discussions about this experience of smoke in late-Victorian popular and scientific journals with a close reading of two aesthetic reactions to the problem—namely the opening of Dickens's *Bleak House* and John Ruskin's "The Storm Cloud of the Nineteenth Century"—so as to establish that our modern understanding of smoke as a pollutant was less a consequence of late eighteenth-century industrialization than of fin-de-siècle social concerns.

Chapter Two explores how the perception of smoke as an ever-expanding and uncontainable hazard shaped its representation in the Holmes canon. I argue that readers were drawn to Doyle's detective fiction partly because his narrative method—a strategy I call Holmesian logic—creates a reassuringly ordered universe, which promises that even the most baffling of clues can be assigned a discrete and comprehensible value. A comparison between the Holmes stories and Doyle's *The Poison Belt* suggests that Doyle saw smoke as posing a unique threat to Holmesian logic because, understanding pollution as ever-expanding and uncontainable, he knew that it could not be ascribed a finite meaning without first being recast as a different substance. It is only in reinterpreting—and in fact anachronistically misinterpreting—English pollutants as foreign miasma that Holmes is ultimately able to make sense of smoke within the realm of Holmesian logic.

Chapter Three explores legal efforts to address the problem of pollution once smoke was recognized as such. I am particularly interested in contrasting the surprisingly divergent approaches to allocating liability in the context of workmen's compensation on the one hand, and pollution nuisance on the other. I argue that this economically-inexplicable variance is a consequence of a fundamental difference between familiar anxieties about general harm and new anxieties about entropic degeneracy and not, as is frequently imagined, a result of some ignorance on the part of legislators. Victorian legislators were well aware of the environmental problem threatening their cities. Smoke was a persistent nuisance: it was known to damage buildings and people were increasingly realizing that it was making them sick. But legislators were often reacting to the conceptual threat of pollution as an ever-expanding boogeyman, and not to the actual,

objective environmental threat they were facing, and this misalignment led them to miss valuable opportunities to pragmatically incentivize smoke abatement.

Perhaps the most thorny issue faced by legislators was the multiple smokestacks problem. As chimneys multiplied throughout the 1800s, establishing cause and effect between the source of smoke and the harm it occasioned became increasingly challenging. In cities like London or Manchester, tracing a particular instance of property damage to a specific guilty party was often impossible. Estimating precisely how much damage a particular business had caused—as tort law required—was even more difficult. In theory, the best means of addressing the multiple smokestacks problem would have been a contributory insurance scheme. But although legislators were perfectly willing to explore insurance as an alternative to employers' liability in tort, they curiously failed to even consider it as a mechanism for allocating responsibility for pollution. As I demonstrate, the same legislators who championed the idea of insurance in the context of workplace safety were not willing to apply it to pollution precisely because the phenomenon tapped into the broader cultural anxiety about entropic degeneracy. Legislators were not reacting to the actual threat, but rather to their anxieties about what that threat represented.

Chapter Four traces these same anxieties in late-Victorian vampire fiction, analyzing Bram Stoker's subversion of Holmesian logic in *Dracula*. Having his protagonists rely on Holmes's deductive strategy, Stoker demonstrates that it is unable to successfully categorize a phenomenon—or foe—that resists physical and conceptual containment. Convinced that Dracula can be vanquished according to established

Holmesian rules, Van Helsing and his team ultimately watch him evade their grasp as a cloud of smoke. Moreover, in describing his vampire as both an environmental pollutant and a physical contaminant, Stoker makes Dracula not only multivalent but also a mechanism for producing multivalence in others. Not merely an unstable clue, the Count ultimately replicates his semiotic instability in both the intra- and inter-textual readers who seek to interpret him.

I analyze the Holmes stories and *Dracula* in tandem not because both respond to anxieties about entropic degeneracy—as much can be said about other late-Victorian fictions—but because they respond to those anxieties in deliberately extralegal ways. Even as concerns about entropic degeneracy led Victorian lawmakers to miss opportunities to address coal smoke practically, thus rendering legal structures less able to resolve the problem of environmental pollution, Doyle and Stoker created protagonists who either operate on the margins of those structures or circumvent them entirely. Holmes, who owes his thriving career as a private detective to police incompetence, supplants the investigatory duties of a public sector that had only recently begun to police urban spaces and was predictably ill-equipped to deal with the modern criminal. Stoker, meanwhile, depicts a legal system rendered powerless in the face of a vampire who successfully avails himself of the trappings of modern commerce. Indeed, the vampire hunters must not only assume the role of law enforcement, but also actively evade the authorities for fear that an "account of [their] movements during the night" would expose them as grave-robbers (Stoker 177). In so emphatically rejecting the legal apparatus as insufficient, both Doyle and Stoker ultimately propose a heroic rather that social strategy

for neutralizing the threat of metaphoric pollutants. As I will demonstrate, this conservative model proves effective only for Holmes, and only because the criminal menace he faces is at its basis individual rather than multivalent, containable rather than entropic.

CHAPTER ONE
Redefining Airborne Emissions From Static Waste to Entropic Pollutant

To link pollution theory to late-Victorian anxieties about entropic degeneracy, it is essential to first trace the development during the latter half of the eighteenth century of pollution as a conceptual category distinct from waste, in other words the shift from miasma theory to pollution theory. Solid waste had for centuries been managed through containment and removal: given sufficient resources, it was believed, one could relocate even the largest refuse pile. Miasma theory plugged airborne wastes into the same conceptual framework by imagining noxious gases as springing from discrete sources of environmental otherness that could be relocated, neutralized, or avoided. While the proliferation of coal smoke between 1750 and 1800 challenged both miasma theory and the belief underlying it that waste, even in its gaseous form, could successfully be contained, early industrialization was not a sufficient catalyst for the emergence of pollution as a concept. Indeed, miasma theory survived as the dominant cultural paradigm for several more decades because its proponents were able to co-opt the public discussion about smoke in two ways. First, smoke was said to function as a miasma disinfectant, and was thus rendered compatible with miasma theory. Second, coal smoke was imagined as a London problem that was geographically localizable.

Exponentially rapid industrialization in northern England during the early nineteenth century, however, gradually undermined both premises. As soot-belching chimneys transformed first Manchester's skyline and then its surrounding countryside, the comforting fiction that smoke was solely a London concern was replaced by a growing dread that England would one day teem with countless "little Manchesters"

(Ginswick 3). And because Manchester's coal smoke was perceived as an industrial and therefore novel phenomenon, the scientists and journalists working there were the first to understand and describe smoke in a novel way, bypassing the narrative of containment and positing it as a pollutant.

The rhetoric of environmental hazard first articulated in Manchester would not resonate nationally until the last two decades of the nineteenth century because it was only then that Victorians were ready to imagine industrial smoke as ever-expanding and therefore uncontainable. New advances in bacteriology undermined miasma theory, at once making it difficult to blame declining air quality on anything but coal and discrediting the idea of smoke's role as a disinfectant. Ultimately, as the legitimacy of miasma theory waned, the concept of pollution emerged not only to describe an observable environmental phenomenon but also to express anxieties about entropic degeneracy.

This chapter will trace changing attitudes in the popular understanding of refuse, arguing that the late-Victorian fetishization of smoke was a reaction to broader anxieties about entropic degeneracy. Because subsequent chapters will examine reactions to these anxieties—namely the propagation of legal and fictional narratives positing that pollution was containable, including smoke abatement regulations and Doyle's treatment of fog in the Holmes stories—it is necessary to first establish that the modern understanding of smoke as a pollutant was not, as is commonly assumed, a product of late eighteenth-century industrialization but rather of fin-de-siècle social concerns.

Part I: Recapitulating Narratives of Waste Containment Through Miasma Theory

The disposal of solid waste in the ancient world was premised on a belief in its containability and removal: Trojans threw garbage into the streets for consumption by foraging animals, Athenians carted refuse to dumps beyond city limits, and Romans dumped waste directly into the Tiber. The medieval understanding of waste echoed that of the ancients, and refuse continued to be treated as a problem that could be solved through containment and removal. In Chaucerian London, for example, ward bailiffs supervised numerous rakers tasked with collecting street waste and removing it from the city once each week (J. Alexander 1-6). Meanwhile, Parisians who for centuries had tossed their trash out the window for scavenging animals were now required to transport it beyond the city limits. One Parisian ordinance demanded that anyone bringing a cart of sand, soil, or gravel into the city leave with a comparable load of refuse (Melosi 8). This regulation was particularly significant in that it betrayed an understanding of solid waste as not only containable but also strictly proportional in effect to its physical dimensions: the primary inconvenience occasioned by a pile of refuse could be measured by the space it occupied. The medieval city, in turn, was perceived as a closed system that could successfully expel waste so as to make room for useful materials.

In England, this logic of containment remained unchallenged until the Industrial Revolution began transforming the country into an industrial-urban nation. The shift occasioned an increase in the production of cheap goods that could be discarded and replaced more readily than ever before. As affluence rose, so too did the piles of garbage in the cities, and nowhere was this problem more pronounced than in populous London. While the capital was not the only English city that industrialized itself into a garbage

crisis—by 1800, northern factory towns like Manchester and Leeds were not far behind—its larger residential population generated larger quantities of solid refuse. The speed with which London's population grew (from one million to over two in the first half of the nineteenth century alone) frustrated medieval waste-management solutions like river dumping and transportation beyond the city limits. Because manufacturing in London was not as integral to the city's self-image as it was in places like Manchester, London's inhabitants understood the refuse problem as one of primarily domestic rather than industrial waste. This framing would have a significant impact not only on London's relationship with waste generally but also on its approach to industrial waste in particular. Because all waste was imagined as consisting primarily of domestic refuse with which people had been familiar for centuries, the new phenomenon of industrial emissions was subsumed into a preexisting category and not treated as a distinct species of matter.

Londoners viewed solid factory refuse as they had viewed garbage for centuries and, in the absence of an alternative conceptual framework, inserted it into the longstanding narrative of containment and removal. It is hardly surprising, therefore, that the solution to the garbage crisis in the Thames should have been premised on meeting those two goals more efficiently. In 1847, under the leadership of public health activist Edwin Chadwick, London's Metropolitan Sanitary Commission proposed a sewer system capable of removing refuse from the city. The proposal initially languished due to inadequate funding, but the Great Stink of 1858 was enough to prompt the construction of a uniform sewage system. Designed by civil engineer Joseph Bazalgette, the system stretched for nearly one hundred miles and included six main interceptor sewers that

annually diverted as much as fifty-two million gallons of sewage to the Thames Estuary (Porter 73-74).

Though an impressive feat of modern engineering, the London sewer system recapitulated the same logic of containability and removal that defined the English understanding of waste. It is important to note that this continued reliance on a familiar approach cannot be explained by the absence of alternative waste-management theories. Even as the sewage problem was debated in Parliament, its ventilation officer Goldsworthy Gurney proposed treating sewage by burning off its organic components through a series of steam-jet furnaces before dumping what was left into the river. Gurney's proposal, however, was rejected because "[a]lmost everyone agreed that the sewage must *go* elsewhere" (Porter 66, emphasis added). Recycling-based solutions also failed at least partially because they were incompatible with the understanding of waste as containable and removable. During the 1850s, a few English entrepreneurs posited that sewage, once chemically detoxified and diluted, could be transformed into manure and used as agricultural fertilizer. The idea was not unprecedented. As early as 1835, the Thames Improvement Company had explored the possibilities of recycling, but folded before making any progress toward that goal. A number of other individuals, Chadwick among them, floated the idea throughout the 1840s. London Sewage Company Engineer Thomas Wicksteed, for example, suggested filtering sewage through giant treatment beds and using the remaining solid matter as fertilizer. City officials, however, found the plan too grandiose and the London Sewage Company failed to pursue it due to insufficient funding (Porter 67-68).

But government officials were not categorically opposed to the idea of recycling sewage. In 1866, a royal commission published information for town leaders wishing to build local filtering stations. By then, private facilities operating in Essex, Edinburgh, Brussels, and the London suburb of Croydon had already demonstrated that a modest sewage recycling scheme could be executed effectively. But as many farmers resisted the idea of depositing even treated waste onto their crops and as concerns about costs rose, government support waned. Rather than invest resources into a large public recycling project, officials deemed such operations unfeasible and focused instead on containing and removing waste from the city (Porter 68-69). Thus, despite periodically flirting with it, Londoners did not seriously embrace the idea that solid waste could be repurposed for local use rather than removed elsewhere. Containment remained the order of the day for solid waste, be it organic or artificial, domestic or industrial.

The logic of containment governing the treatment of solid waste was recapitulated in the approach to gaseous waste. For centuries, gaseous emissions had been viewed through the prism of miasma theory, which incorporated all gases—from those emitted by decomposing matter to domestic and later industrial coal smoke—into the same containability framework that was applied to solid waste. Pre-Victorian scientists routinely misattributed the toxic effects of coal smoke to natural processes by blaming all airborne ills on miasma. Consequently, even as urban air quality deteriorated due to smoke, the most contaminated environments were thought to be not the cities but those areas, like marshes, jungles, cesspools, and sewers, that were rife with decomposing biomass.

The term miasma was coined by the Greeks, who used it to describe the odors emanating from swamps and marshlands. They believed miasma was composed of particles of decomposing matter known as miasmata, which the Greeks associated with disease. The assumption that foul odors were vectors of illness persisted in the western imagination. Medieval examples of the belief are legion: the site of Winchester Cathedral, for example, was moved in order to escape the "unhealthy and foul-smelling bog that had formed around it" and the monks at White Friars complained that some of their number died due to the stench rising from London's River Fleet (Brimblecombe 9). In his 1674 *Suspicions about some Hidden Realities of the Air*, philosopher and chemist Robert Boyle lamented miasmata when describing the atmosphere as "[a] confused aggregate of effluviums from such differing bodies, that, though they all agree in constituting, by their minuteness and various motions, one great mass of fluid matter, yet perhaps there is scarce a more heterogeneous body in the world" (qtd. in Hall 187).

Miasma theory thrived well into the nineteenth century. By 1800, most people in Britain attributed atmospheric impurities to natural processes (Thorsheim 10). In 1830, physician Thomas Southwood Smith warned that "[n]ature, with her burning sun, her stilled pent-up wind, her stagnant and teeming marsh, manufactures plague on a large and fearful scale" (qtd. in Eyler 99). The London cholera outbreaks of 1831, 1848, 1853, and 1866 only cemented this association between miasma and illness. As the disease began spreading across Asia and continental Europe during the 1820s, medical journals and newspapers throughout England became the forum for debate about the nature of the illness and the mechanism of its transmission. The discussion fueled anxious speculation among the public. Within a year of cholera's landfall in Sunderland in 1831, fear of the

disease had led to at least thirty riots (Halliday, *Stink* 125). The public's fear of cholera prompted some Victorians to embrace new callings as public health reformers. Dubbing themselves sanitarians, they "maintained that their expertise was vital to prevent unhealthy environments from poisoning the air with miasma" (Thorsheim 12). By 1856, over seven hundred books, pamphlets, and articles seeking to shed light on the causes of cholera had been published in London alone, and those penned by sanitarians kept miasma theory at the forefront of the debate. As the third outbreak made its way toward England in 1853, *The Lancet* summarized the public's confusion, asking: "What is cholera? Is it a fungus, an insect, a miasma, an electrical disturbance, a deficiency of ozone, a morbid off-scouring of the intestinal canal? We know nothing; we are at sea in a whirlpool of conjecture" (*Lancet* 22 Oct. 1853, 393-94). In the absence of concrete answers—bacteriologist Robert Koch did not isolate the cholera bacillus and confirm that it was spread through contaminated water until 1883—*The Times* offered numerous explanations. The possibilities included telluric theory, which imagined cholera as emanating from the earth, electric theory, which attributed the disease to atmospheric electricity, and ozonic theory, which linked it to a shortage of the ozone. Finally, zymotic theory suggested that the atmosphere consisted of unstable compounds which, once heated by a warm climate or electric current, fermented to create miasma. Its chief proponent, Justus von Liebig, argued that when those compounds emanated from the bodies of cholera victims, the resulting gas would spread the illness to those nearby who had the misfortune of inhaling it (Halliday, *Stink* 126-27).

Of the suggested explanations for cholera transmission, Von Liebig's zymotic theory gained most traction among the early Victorians primarily because most public

health authorities were sanitarians and, as such, had staked the legitimacy of their efforts not only on miasma theory but also, more fundamentally, on the view that sanitation could be accomplished through containment and removal. (It would have been comparatively more difficult to derive authority as a public health expert from theories—like the electric and ozonic—that did not admit of mitigation or management.) Lifelong sanitarian Florence Nightingale, for example, warned nursing school students in 1859 to "have sufficient outlet for the impure air" generated by the body "to go out; sufficient inlet for the pure air from without to come in" (16). Physician Neil Arnott shared the same concerns with Parliament in 1844, noting that "[t]he immediate and chief cause of many of the diseases which impair the bodily and mental health of the people . . . is the *poison of the atmospheric impurity* arising from the accumulation in and around their dwellings of the decomposing remnants of the substances used for their food" (1844 Report 50, emphasis in original). Chadwick's support of miasma theory was equally ardent. In 1846, he informed the Parliamentary Committee debating the Thames sewage problem that "[a]ll smell is, if it be intense, immediate acute disease; and eventually we may say that, by depressing the system and rendering it susceptible to the action of other causes, all smell is disease" (qtd. in Halliday, *Stink* 127). As Halliday notes, "[f]rom this shaky premise Chadwick drew the conclusion that it was more important to remove smells from dwellings than to free the Thames of sewage since, according to him, the smells were the causes of disease" (*Stink* 127).

The early Victorians routinely associated miasma and foul smells with the visitations of fog that so frequently plagued their capital. One contributor to an 1863 issue of the *Leisure Hour* wrote that "the cause of fog [was] the defective drainage of the

lands and marshes, extending for miles on the banks of the Thames, south and east of the city" ("London Fog" 774). While Londoners associated fog with disease generally, it was most frequently linked to outbreaks of influenza and malaria. In his 1859 book, *On Health, as Depending on the Condition of the Air*, physician J. White dismissed the suspicions of the few contemporary doctors who thought that malaria was spread by mosquitoes, ascribing it instead to "the condition of the air" (qtd. in Thorsheim 16). The previous year, epidemiologist Edward Headlam Greenhow, who would go on to serve as the president of the Clinical Society of London, explained the origins of the city's influenza epidemic by noting that it had been preceded by a particularly heavy fog (Thorsheim 16). The opacity of the fog also imbued the miasmatic vapors that were thought to have caused it with additional nefarious potential. In 1892, *The Lancet* estimated that in one month alone as many as eight Londoners drowned after losing their way in the heavy mist ("Frost" 40). Fog was also blamed for a perceived increase in urban crime rates. An 1855 issue of *Hogg's Instructor* called fog "a very carnival of petty larceny," where pick-pocketers could easily ply their trade on unsuspecting pedestrians ("Observations" 55).

Many Victorian writers complicated the association between miasmatic fog and crime by representing the phenomenon as symbolic of broad trends of social decay. In the famous first chapter of *Bleak House*, for example, Charles Dickens informed his readers that "[n]ever can there come fog too thick, never can there come mud and mire too deep, to assort with the groping and floundering conditions which th[e] High Court of Chancery, most pestilent of hoary sinners, holds . . . in the sight of heaven and earth" (2). Dickens describes the Chancery Court building as "dim, with wasting candles here and

there," adorned by "stained-glass windows [that] lose their color and admit no light of day into the place," and beset by fog so heavy "as if it would never get out" (*Bleak House* 2). Its members, in turn, are described as "all stuck in a fog-bank" and "*mistily* engaged in one of the ten thousand stages" of *Jarndyce v. Jarndyce* (*Bleak House* 2, emphasis added). By thus conflating environmental deterioration with the decay of not only overarching legal structures but also of Chancery,[1] Dickens casts fog as a manifestation of deterioration rather than merely the result of such a process.

While Dickens's approach to fog in *Bleak House* is most immediately noteworthy in that it casts the phenomenon as a portent of social deterioration, his descriptions of the atmosphere can arguably be approached—albeit loosely—as a first-hand account of mid-century weather conditions in London. Moreover, Dickens's representation of fog can also be understood as an expression of the mid-century understanding of atmospheric decline. Even as he describes "[s]moke . . . making a soft black drizzle, with flakes of soot in it as big as full-grown snowflakes," Dickens nonetheless betrays his understanding of fog as a miasmatic, organic visitation from the otherwise productive and redeemable countryside (*Bleak House* 1). A totalizing force that is now "everywhere," at home both "up the river, where it flows among green aits and meadows" and "down the river," fog is imagined as originating "on the Essex marshes" and "Kentish heights" and "creeping" into London by way of the Thames (*Bleak House* 1). Once it reaches the capital, fog is "defiled among the tiers of shipping and the waterside pollutions of a great (and dirty) city" (*Bleak House* 1). Thus commingled with these "waterside pollutions"—that is, with the solid waste deposited into the Thames—fog becomes an irritant "in the

[1] The Court of Chancery, which had emerged around 1390 as an equitable alternative to arcane writ-based pleading, itself devolved into an arcane and corrupt bureaucracy during the nineteenth century. For further discussion of Chancery, see Chapter Three.

stem and bowl of the afternoon pipe of the wrathful skipper, down in his close cabin" and a contagion "in the eyes and throats of ancient Greenwich pensioners, wheezing by the firesides of their wards" (*Bleak House* 1). More immediately, Dickens's fog also threatens physical injury by "cruelly pinching the toes and fingers of [the] shivering little 'prentice boy on deck" and, more insidiously, by obscuring the vision of "[c]hance people on the bridges peeping over the parapets into a nether sky of fog, with fog all round them, as if they were up in a balloon, and hanging in the misty clouds" (*Bleak House* 1).

Significantly, Dickens affords smoke and fog separate treatment, describing the former as part and parcel of the solid muck accumulating on London streets, and the latter as a distinct emanation from the countryside. Smoke is depicted as a particulate which, after "lowering down from chimney-pots . . . add[s] new deposits to the crust upon crust of mud, sticking at those points tenaciously to the pavement, and accumulating at compound interest" (*Bleak House* 1). While Dickens imagines the resulting sedimentary muck as generative in a geologic sense—there is "[a]s much mud in the streets as if the waters had but newly retired from the face of the earth, and it would not be wonderful to meet a Megalosaurus, forty feet long or so, waddling like an elephantine lizard up Holborn Hill"—fog is miasma made manifest and as such an actual rather than imagined generative threat (*Bleak House* 1). While the soot discolors dogs to so great an extent as to render each "undistinguishable" from the next, splashes horses with muck "to their very blinkers," and "infect[s]" jostling pedestrians with "ill temper," it is miasmatic fog, and not smoke, that actually leaves pensioners wheezing and deck hands shivering (*Bleak House* 1).

The belief in miasma theory evinced in popular novels like *Bleak House* was so appealing because it conceptually reduced gaseous impurities to a containable phenomenon. Because sources of miasma—organic matter and areas, like swamps and jungles, that were rife with it—could be removed from populated areas or avoided, the danger posed by miasma was viewed as something that could be managed, given sufficient resources. As one English physician explained in the 1870s, "[t]he night air in towns is often the purest" because while "malaria, and agues might be the result of exposure to [country air] . . . in most towns . . . there is no danger in breathing night air from without; the real danger is from night air within doors" (qtd. in Thorsheim 14). Indoor night air, however, could be managed through containment and removal. In 1855, *The Times* counseled its readers that because "the vitiation of the air by domestic animals kept in the house [was] very considerable," the practice of "keeping of such animals in small houses ought not to be tolerated" (qtd. in Thorsheim 12). Birds, the newspaper warned, "consume[d] a very large quantity of oxygen, and the excrements of these and of domestic animals generally increase[d] the poisonous effect of their presence" (qtd. in Thorsheim 12). Four years later, a public health pamphlet delivered a similar warning about houseplants, noting that "[t]hose pretty plants . . . which [urbanites] put in the bed-room window, to look cheerful and bright, rob[bed them] of good air . . . for [plants] have a way of breathing and want air just as [humans] do" (Ladies' Natl. Assn. 7). It was believed that the solution to this problem could easily be accomplished by removing animals and houseplants from city dwellings. As the same logic was applied to the removal of human and animal excretions from city neighborhoods, the dumping of

sewage into rivers was deemed preferable to having it contaminate the air with miasmatic vapors.

It was said that urbanites able to remain diligent about waste management could protect themselves from disease, a suggestion that made the dangers of gaseous impurities seem both as predictable and as controllable as the biomass from which those impurities were believed to have sprung. This emphasis on the containment of impurities and the suggestion that they could in fact be contained was also a useful political fiction, insofar as miasma theory offered a justification for colonialism (Thorsheim 11). As one British observer noted in 1862, tropical areas "where vast quantities of organic matter, the *débris* of a luxuriant vegetation, are rapidly passing into decomposition" were especially dangerous and in need of taming ("Modifications" 146). For those who called sub-Saharan Africa the white man's grave, the high mortality rates experienced by British colonists, soldiers, and missionaries while in the tropics only confirmed the association between miasma and death. James Lane Notter, an instructor at the Army Medical School in 1880, taught his students that while "[i]n any climate and under any circumstances the exuberant growth of plants and trees [was] bad," it was particularly hazardous "in the tropics, where rank vegetation abounds" (qtd. in Thorsheim 11). The "rapid and uncared-for growth," he warned, resulted in "decay . . . with all its attendant products of decomposition, poisoning the air, and rendering, by its noxious vapours and mists, the atmosphere unendurable" (qtd. in Thorsheim 11).

While the Victorians ascribed atmospheric impurities to miasmatic vapors, most were not concerned by coal smoke. As Alain Corbin observes, "[w]hat was intolerable was the odor of putrefaction or fermentation, not of combustion" (66). In fact, wood and

coal smoke were not only deemed harmless but were actually considered antidotes to miasma. The belief that the carbon and sulfur found in smoke could neutralize contaminated air predated the Industrial Revolution. Following outbreaks of the plague in London during the sixteenth and seventeenth centuries, city officials directed residents to build large bonfires in order to disinfect the air. During the Industrial Revolution, industrial coal smoke was subsumed into the same narrative, and its salubrious properties were publicly touted well into the nineteenth century. In his 1848 book, *Change of Air*, surgeon John Atkinson counseled tuberculosis patients to inhale smoke because "carbonaceous matter, even gas from coals, [would], when judiciously administered, prove beneficial . . . [in the] suspension of tuberculization" (26). Speaking at the opening of an antismoke exhibition in 1881, the Mayor of London similarly argued that industrial smoke was responsible for the capital's plummeting malaria rates, noting that "after the erection of the great factory chimneys the disease had not affected people living in . . . neighborhood[s]" abutting the Thames (qtd. in Thorsheim 17). Even the unsightly soot deposited on London homes was recast as a disinfectant. The early Victorians, who already employed ash as an insecticide, fertilizer, and toothpaste, and even consumed it as a remedy for stomachaches, were more than willing to believe that it could also neutralize miasma (Mosley 80). In 1864, John Ibbetson Tracy informed the Society of Arts that while smoke had likely contributed to "the failure of portions of the stone in front of Westminster Hall," the substance was not altogether bad because "carbon which was deposited on the roofs of the houses in the form of soot, and afterwards washed away by rain, and conveyed into the sewers, acted, in a great degree, as a deodorizer of the

sewage matters, and in that way was beneficial in a sanitary point of view" (Society of Arts 153).

The industrial sector did what it could to shore up the public's confidence in the benefits of coal smoke. In 1858, factory owner Peter Spence opined that the carbon emitted during manufacturing was not only "guiltless of any deleterious effect on human health" but indeed "one of the most anti-putrescent bodies, [which] while floating in the atmosphere, does all it can to arrest and destroy noxious and miasmatic vapors" (qtd. in Thorsheim 17). Spence added that "sulphurous acid gas . . . [was] in itself one of the best correctives of miasma," albeit "certainly a most insalubrious atmosphere to breathe constantly" (qtd. in Thorsheim 17). Spence's views were widely publicized in the *Chemical News*, which noted in 1862 that the acid rain created by coal smoke was "rather beneficial to health than otherwise, as tending to retard the putrefaction of animal matter on which it falls" ("Modifications" 147).

These early-Victorian efforts to incorporate industrial coal smoke into miasma theory are important because their success calls into question the assumption that the recognition of smoke as a pollutant was a direct consequence of its abundance. To the contrary, the proliferation of smoke during the Industrial Revolution was in itself not sufficient to recast smoke as a hazard, a fact which suggests not only that the Victorians were heavily invested in the narrative of waste containability but also that some additional pressure—namely anxiety about entropic degeneracy—was required to turn the purported disinfectant into a toxic hazard.

Part II: Rejecting Narratives of Waste Containment in Smoky Manchester

Even as they touted the beneficial properties of coal smoke, the early Victorians also clung to the belief that its negative effects were a London problem, and as such conceptually localizable in the capital. This view can be traced to the history of coal consumption in England, which until the Industrial Revolution centered on London and its surrounding areas. By the late 1700s, smoke was considered so emblematic of the capital that the willingness to cheerfully tolerate it became a proxy for urban resilience. Londoners who complained about the condition of the air were advised to relocate to the countryside and those lamenting wilting city gardens were told to either plant hardier species or likewise leave for the suburbs (Brimblecombe 90). More than a source of local pride, London's notoriety was simultaneously reassuring insofar as it suggested that the worst coal emissions were contained (and therefore containable) in one metropolitan area. So long as its situation was perceived as unique, London's smoke problem could be imagined as existing outside the national norm.

The popular perception of London as appreciably smokier than other English cities was factually accurate until the nineteenth century. Lancashire, which would become a hub of industry by the fin de siècle, consumed modest amounts of coal until the Industrial Revolution. Prior to 1700, the Lancashire coalfield produced only 50,000 tons annually (Mosley 15). But while that amount remained relatively stable during the subsequent six decades, levels of coal consumption rose during the early 1760s, due both to the decreasing availability of cheap wood and the construction of the Bridgewater Canal, which transformed Manchester into an industrial metropolis within only a few decades. The importance of Manchester's industrialization during the late eighteenth and

early nineteenth centuries to the nation's later conceptualization of industrial emissions as pollution cannot be overstated. It was the first city to chip away at the comforting fiction that the nation's smoke problem was localizable to its capital.

Manchester's consumption of coal increased at an unprecedented rate: imports from the Worsley mine alone rose from 17,000 tons in 1765 to 52,000 tons only seventeen years later. By 1782, the mine was transporting 102,000 tons of coal into the city (Mosley 15). While complete records of coal consumption in Manchester and London during the nineteenth century do not exist, the comparisons drawn by the early Victorians themselves indicate that Manchester quickly surpassed the capital. In his 1836 analysis of the social and commercial history of the city, James Wheeler opined that while it had "been calculated, that in London each individual consumes a ton of coal in the year," the amounts used in Manchester were "no doubt . . . greater because of the consumption in dye-works, bleach-works, foundries . . . which [were] said to use double as much coal as cotton factories" (449 n.1). In 1866, Robert Peel presented a more concrete comparison to the House of Commons: "[t]he population of London . . . is about 3,000,000, and the annual consumption of coal amounts to about 5,300,000 tons; but in Manchester, with a population of certainly not more than 380,000, the coal consumption is estimated at 2,000,000 tons per annum" (qtd. in Mosley 18). According to Peel's numbers, at 5.26 tons of coal burned per capita, Manchester's annual coal consumption in 1866 vastly outstripped London's 1.77 tons. Peel's observations are significant not only because they evince a rapid increase in coal consumption but also because they indicate that the Victorians were paying attention to that increase and comparing trends in Manchester's coal consumption to those of London.

Because the bulk of the coal smoke in Manchester was a consequence of industrial rather than domestic use, the speed and visibility with which its atmosphere deteriorated also undermined the view—prevalent in London—that industrial smoke was functionally interchangeable with its domestic counterpart. Unlike Londoners, who complained of domestic hearths and industrial chimneys with equal fervor, residents of Manchester focused their ire on industrial smokestacks. But while industrial combustion undoubtedly increased the extent of Manchester's smoke problem, the qualitative distinction between industrial and domestic applications suggests that the latter, not the former, would have had a more visible effect on the city's atmosphere. Coal is composed principally of carbon, which constitutes between eighty-five and ninety percent of its mass, with the remainder made up in varying amounts by oxygen, hydrogen, nitrogen, and sulphur. When it is burned completely, coal releases water vapor, carbon dioxide, and non-combustible organic residue (or ash) into the atmosphere. Incomplete combustion, on the other hand, creates soot and smoke, the density of which is inversely proportional to the temperature of the furnace from whence it springs. Because they were usually less efficient than industrial furnaces, Manchester's domestic coal stoves were likely responsible for the city's densest smoke clouds.

In addition to the speed with which it developed, the relative severity of Manchester's smoke problem vis-à-vis that of London likely had less to do with the distinction between domestic and industrial applications and more with the chemical composition of the coal burned in the two cities. The difference hinged on sulfur. When it oxidizes during combustion, sulfur turns into sulfur dioxide gas, which then combines with water vapor to form sulfurous acid and sulfuric acid. The latter, historically known

as oil of vitriol, is highly corrosive not only to living organisms but also to stone, brick, metal, and a host of other materials. While the sulfur content of a typical coal line might vary anywhere between 0.5 percent and 4 percent, with 1.3 percent being the average, the Lancashire coal fueling Manchester's mills had a relatively high sulfur content of around 1.4 to 2.9 percent (Mosley 20). An 1895 estimate of the concentration of sulfur dioxide in Manchester's atmosphere published in the *Journal of the American Chemical Society* lists it as 2930 $\mu g/m^3$, well above London's figure of 2180 $\mu g/m^3$ (Brimblecombe 154). While these values are likely representative of only the most polluted days of the year, the comparison they provide between the two cities is informative because it suggests that the intensity of Manchester's smoke problem surpassed that of London. "During the course of the nineteenth century sulphurous, viscid clouds of smoke gradually engulfed [Manchester] and [its] inhabitants, and no one could be insensible as to smoke's effects" (Mosley 20). Of these effects, most noticeable and most frequently lamented were visitations of acid rain and sulfurous fogs, or smogs, which plagued Manchester with increasing frequency as the nineteenth century progressed. While London was familiar with both phenomena, Manchester's problems were more pronounced because greater amounts of sulfur in its coal led, inexorably, to greater amounts of sulfuric acid in its atmosphere. Consequently, Manchester was forced to deal with—and therefore gradually acknowledge—smoke's hazardous nature approximately a decade before coal emissions were recognized as dangerous in London.

The corrosive effects of acid rain on limestone and marble were first documented by John Evelyn in 1661. In a pamphlet entitled *Fumifugium*, Evelyn claimed that smoke filled the air with "an impure and thick Mist accompanied with a fuliginous and filthy

vapor, which . . . corrupt[ed] the Lungs," contributed to the propagation of "Catharrs . . . Coughs, and Consumptions," and damaged priceless antiquities like the Arundelian Marbles (Evelyn 5). Evelyn's prescient assessment was largely ignored until the 1840s, when Scottish chemist Robert Angus Smith reached many of the same conclusions while documenting the effects of Manchester's coal smoke. In an 1859 article in which he coined the term acid rain, Smith suggested that the sulfur found in precipitation was responsible for the cosmetic damage that could be noticed on buildings and other structures throughout the city (Thorsheim 17). Thirteen years later, Smith expanded on these ideas, explaining that because Manchester's rain "contain[ed] nearly a grain of free sulphuric acid per gallon," it routinely "redden[ed] litmus" as if it were "vinegar" ("Amendments" 516). "[T]rees and shrubs," he wrote, "refuse[d] to grow" in such conditions and the grass that managed to survive "look[ed] unhappy" ("Amendments" 516). Smith concluded that "coal alone" could, by generating acid rain, destroy even large trees "wherever chimneys [were] sufficient in number to produce the acidity spoken of" ("Amendments" 516).

As Smith pointed out, Manchester's climate and topography not only conspired to disperse coal smoke onto the surrounding countryside but also changed its character through a series of chemical reactions en route. These in turn compounded the problem and made the popular method of utilizing tall chimneys to remove smoke from the city largely useless. Explaining the theory, Smith noted its limitations:

> When the sky is open, there is a fine clean air in our streets; the gases seem rapidly to follow the laws of their diffusion . . . [i]f the air were constantly clear, we should then have very diminished evils of the kind, as this constant ventilation of the town would take place; but when it is clouded and moist, an entirely different state of things occurs. The acid and other impurities become dissolved in the moisture, and the black parts of the smoke become wet and heavy. At this

> time the air becomes very acid, and the atmosphere, as we approach the more crowded parts of the town, becomes sensibly deteriorated. ("Ancient" 82-83)

This anxiety about the emission of acids and their return as condensation was particularly disturbing because, while waste in all guises could easily be conceived of as undergoing physical transformation, chemical changes implied unpredictable and largely erratic consequences. On both a practical and metaphorical level, understanding of the mechanics of acid rain further enhanced the perception of industrial pollutants as claustrophobic: even on clear days, smoke was perpetually expected to return in a more caustic incarnation.

This change in the popular perception of smoke can also be observed by tracing Manchester's relationship with fog. As the nineteenth century progressed, fogs became more frequent. Between 1804 and 1810, the city experienced only 24 visitations but during the five years following 1820, that number had nearly doubled to 52. By the turn of the century, it would take only two years, 1900 and 1901, to reach the same frequency (Mosley 29). Fogs were also becoming denser and more sulfurous, and especially so during the winter months. As Mosley explains, "[i]n cold, calm atmospheric conditions fog often went hand in hand with an inversion" through which "dark, tarry pollutant matter formed a sticky film around the water droplets, which meant that they evaporated far less easily in the rays of the sun" and "remained trapped at ground level" (28-29). Not surprisingly, the mechanism through which coal smoke first contributed to the creation of smogs and then exacerbated their duration was first understood and documented in Manchester. In 1876, Robert Angus Smith described smoke and fog as enjoying an interdependent relationship, each enhancing the effects of the other:

> [A] still and otherwise peculiar state of the air, such as that which brings fog, causes the accumulation of smoke to a very wonderful extent, and increases the intensity of that phenomenon. It is then that we perceive how acrid the substances in smoke may show themselves. We may then . . . obtain from the air comparatively large amounts of sulphuric acid; and we may see minute globules of liquid which are really dilute vitriol. These affect the eyes and throat, even before the smell. ("Amendments" 513-14)

While the burdens that Manchester's smog imposed on humans were often physical—irritation of the eyes, nose, and throat was a common complaint—the broader economic impact of smog was also a subject of frequent discussion. Waning visibility slowed traffic and delayed trains even as it increased crime and accidents. An 1888 *Punch* article summed up smog's economic effects by noting that it "disarranged" the business "affairs of a great city" (qtd. in Mosley 29). The effects of Manchester's smoke, therefore, were understood as simultaneously localizable in individual bodies and interfering with the rhythms of the community's economic life. This perception imbued smoke with the capacity to destabilize the boundaries between the body and the social environment in which that body existed, making individual physical symptoms symbolic of broader social disturbance.

The caustic effects of the sulfur swirling in the city's atmosphere undermined the association between fog and miasma. As early as the 1870s, Manchester's fog was commonly described as sulfurous and industrial rather than miasmatic (Mosley 28). In 1883, George Davis, District Inspector of Alkali Works, wrote that "[t]he peculiarity of the Manchester fog as compared with the fogs of other places—with London for instance—[was] its extreme pungency, its unusually high charge of sulphurous acid" (170). As Mosley points out, "the increasing frequency of Manchester's fogs, their unnatural brown or black colours compared with white 'country' fogs, their sulphurous

smell, and the acidic nature of these dense choking visitations, were widely recognised to be the result of burning enormous quantities of bituminous coal" (30). Unlike their counterparts in the capital, who during the 1870s were only beginning to question the longstanding link between fog and miasma, Manchester's residents already viewed fog as unnatural. By 1884, the *Manchester City News* confidently proclaimed that "[f]ogs, such as [exist] in Manchester, [were] products of civilization which admit of mitigation and abatement" (qtd. in Mosley 30). Manchester's residents understood smoke not as a disinfectant but as a problem requiring abatement before that view could gain comparable traction in London, and were the first to represent smoke as primarily industrial and its effects as alarmingly totalizing.

The speed with which Manchester's atmosphere deteriorated was arguably more disturbing than even the extent of that deterioration. In his 1816 book *A Picture of Manchester*, Joseph Aston praised the beauty of the countryside surrounding the city, noting that even the poorest residents of Salford Crescent could "always be sure of rich rural scenery in view of their front windows, however crowded and confined the back part of their dwellings may become" (244). Likewise, in *Walks in South Lancashire*, Samuel Bamford suggested that much of the area surrounding Manchester was still "fair and green" in 1844 (9). Only fifteen years later, Robert Angus Smith found the city changed by a "tinge of darkness in the atmosphere" that could "be seen making a line of at least forty miles in length, and affecting the appearance of the sky and landscape" (Smith, "Air" 197). Leo H. Grindon echoed these observations in his *Country Rambles, and Manchester Walks and Wild Flowers*, where he called the city "grim, flat, smoky, with its gigantic suburb ever on the roll further into the plain" (2).

Accounts of Manchester's atmospheric decline were hardly limited to travel narratives. Novelists writing about the city during the 1840s and 1850s evoked a hellish landscape of oppressive darkness. In 1848, Elizabeth Gaskell imagined it a "nasty, smoky hole" where Mary Barton made "a home in the middle of smoke" (314). Modeling the fictional Coketown of *Hard Times* on Manchester, Dickens likewise described it as "shrouded in a haze of its own, which appeared impervious to the sun's rays" even on the brightest midsummer day (116). "Seen from a distance," the town appeared as a disordered "blur of soot and smoke, now confusedly tending this way, now that way, now aspiring to the vault of heaven, now murkily creeping along the earth . . . a dense formless jumble, with sheets of cross light in it, that showed nothing but masses of darkness" (*Hard Times* 116). In *North and South*, Gaskell wrote of "a deep lead-coloured cloud hanging over" Milton, her own stand-in for Manchester, where "the air had a faint taste and smell of smoke" and "great oblong many-windowed factor[ies]" endlessly "puff[ed] out black" clouds "like a hen among her chickens" (55).

While Gaskell and Dickens described Manchester's smoke with equal parts imagery and eloquence, naturalists dryly documented smog's ecological toll. In 1859, botanist Leo H. Grindon, who painstakingly detailed over seventy species of lichen in *Manchester Flora*, lamented the effects of sulfurous fogs and acid rain on the city's vegetation. Because they were particularly sensitive to sulfur, many of the lichens Grindon loved were among the first species to disappear from Manchester. Mosses were similarly effected: the vast amounts of acid rain seeping into Manchester's peat decimated the city's *Sphagnum* mosses, which were replaced by the cotton grass and bilberry moorland that remain there to this day. Some parts of the city, like the districts of

Bradford and Ancoats, were too toxic even for these hardy grasses. In 1882, one Manchester resident complained that the "fruitful vales where vegetation flourished, roses grew in abundance, and the most delicate flowers thrived, ha[d] been changed by the deleterious compounds of coal-smoke into barren deserts" where "no vegetation, no roses, no flowers" remained (qtd. in Mosley 43). "What once were trees with wide-spreading branches," he wrote, "ha[d] either disappeared or [were] represented only by a stunted rotten stump" (qtd. in Mosley 43).

This loss of vegetation led to an equally noticeable decline in Manchester's avifauna. Between 1850 and 1860, birdwatcher John Plant recorded seeing 71 varieties of the 259 bird species native to Lancashire in Peel Park, and noted that 34 of these species were producing offspring. Between 1870 and 1875, Plant saw 19 species, only eight of which were reproducing. By 1882, those numbers had dropped to five and two, respectively. The phenotypes of Manchester's birds were also changing. By 1896, Julius Cohen compared "a Leeds magpie, shot near Stainbeck Lane" to its country cousins, noting that it was "tarred with [a] universal tar brush" and bore "evident signs of his town residence" (qtd. in Mosley 45). According to Cohen, "[n]ot only [were] the white feathers badly discoloured, but there [was] a striking absence of the gloss and beautiful iridescence of the black ones, visible in [the] country magpie" (qtd. in Mosley 45).

Even Edward Schunck, President of the Society of Chemical Industry and a longtime advocate of industry, was eventually forced to admit that the quality of Manchester's air was declining at an alarming rate. The society as a whole, which counted not only chemists but also factory managers and prominent manufacturers among its membership, was not at all antagonistic to industrial concerns. Nonetheless, in

1897 Schunck told the group "that matters [were] much worse than they were years ago" (qtd. in Mosley 23). Explaining that because he lived "some 200 feet above the level of the River Irwell . . . [he] enjoy[ed] the advantage of surveying a considerable portion of the two towns of Manchester and Salford," Schunck observed that while "distant objects, such as the hills of Cheshire and Derbyshire, and even buildings on these hills, were formerly visible on clear days," they could "no longer [be] seen on any occasion whatever" due to "smoke and its emanation" (qtd. in Mosley 23). Schunck's observations are noteworthy for two reasons. First, and most obviously, they illustrate that Manchester's smoke problem was by 1897 so severe as to prompt even industrialists to lament its extent. Second, Schunck's comments suggest that Manchester's citizens articulated the smoke problem in terms of its effects on the landscape.

As Mosley argues, the speed with which the effects of industrial emissions affected the landscape made the phenomenon seem expansive and uncontrollable: "[f]rom the turn of the nineteenth century, Manchester's smoke cloud was seen to be an ever expanding, ever present element of the urban environment" (21). A correspondent writing for the *Morning Chronicle* in 1850, for example, described the factories and "hundred mills" surrounding the city as "rais[ing] their dingy masses everywhere around" (Ginswick 3). Most significantly, "the foulness" of Manchester was imagined as not only robbing the surrounding countryside of its vitality but also as creating new sources of pollution through a kind of perverse self-replication. Beyond the city itself, "[h]uge, shapeless, unsightly mills, with their countless rows of windows, their towering shafts, their jets of waste steam continually puffing in panting gushes from the brown grimy

wall" functioned as "outlying satellites of the great cotton metropolis" which "all ha[d] similar features—they [were] all little Manchesters" (Ginswick 3).

Part III: Replacing Miasma Theory with Rhetoric of Pollution

After the speed with which Manchester's atmosphere deteriorated made it clear that the negative effects of coal smoke were not conceptually containable as a phenomenon particular to London, miasma theory—and its depiction of smoke as a disinfectant—remained the only fiction buffering the Victorians from the widespread realization that industrial air emissions posed a threat to their health. New advances in bacteriology during the late nineteenth century, however, gradually undermined miasma theory and in so doing removed the public health justification for industrial emissions, recasting them as pollutants.

Much of the conceptual groundwork that would prove essential to severing the link between airborne toxins and miasma, and therefore to redefining smoke as a pollutant, can be traced in John Ruskin's 1884 lectures on the *The Storm-Cloud of the Nineteenth Century*. In the lectures, Ruskin marshals ten years' worth of first- and second-hand meteorological observations to construct a symbolic relationship between deteriorating atmospheric conditions and the cultural decay that, he argues, is a direct consequence of modernity. While much has been made of the lectures' value as social criticism, only a few scholars—Thorsheim among them—have pointed to their significance as evidence of actual atmospheric decline. As Thorsheim notes, "[t]o Ruskin, the observation that the air had deteriorated was *both* a statement of fact and a sign of humanity's failings" (56). Because Ruskin's observations are primarily anecdotal and

more or less sporadic, they cannot be treated as an objective record of atmospheric degradation. Ruskin's interpretations of the phenomena he details, however, shed considerable light on what the late-Victorians perceived as four troubling characteristics of atmospheric degradation, namely its sudden onset, malignancy, unpredictability, and resistance to scientific solutions.

Ruskin first explains that this new species of cloud, initially observed in 1871, is precisely that: new and terrifying in its novelty. Unlike the familiar clouds that precede a rainfall, this "gray cloud" is presented as "not rain-cloud, but a dry black veil, which no ray of sunshine can pierce; partly diffused in mist, feeble mist, enough to make distant objects unintelligible, yet without any substance, or wreathing, or colour of its own" (Ruskin 46). Ruskin calls it a "wind of darkness" because while "all the former conditions of tormenting winds, whether from the north or east were more or less capable of co-existing with sunlight, and often with steady and bright sunlight," the plague-wind produces instant gloom (48-49). This new wind, he notes, is possessed of a uniquely "malignant *quality*" in that, "unconnected with any one quarter of the compass; it blows indifferently from all, attaching its own bitterness and malice to the worst characters of the proper winds of each quarter" (49).

Ruskin then expands on that malignancy by offering concrete examples of the wind's ill effects. He points, for example, to one correspondent's observation that the new "devil-wind" leaves "all plants black and dead, as if a fiery blast had swept over them," and "[a]ll the hedges on windward side black as black tea" (118). Ascribing to the plague-wind a nervous and feverish quality—he calls it "tremulous at every moment"—Ruskin also suggests the malignant effect it has on the psyches of its bewildered

observers (51). The malignancy Ruskin bemoans is at times even more insidious. It subverts not only the appearances but also the functions of previously reliable structures. The wind not only degrades the quality of the sky, but also robs it of its very purpose: "instead of adding light to the unclouded sky, [it] takes away the aspect and *destroys the functions* of sky altogether" (Ruskin 74, emphasis added).

Third, Ruskin describes the plague-wind as unpredictable, appearing suddenly and behaving with a furious and erratic intensity once it arrives. The "whole sky," he notes, darkens "in about two hours" and each episode of the darkness is preceded with only a trembling of the air (43-44). While one may sometimes see "the kind of quivering, and hear the ominous whimpering, in the gusts that precede a great thunderstorm . . . plague-wind is more panic-struck, and feverish; and its sound is a hiss instead of a wail" (Ruskin 50). Similarly, the intensity of the wind is also described as waxing and waning seemingly without explanation. While there are days "on which it blows without cessation . . . also there are days when . . . it will remit for half an hour, and the sun will begin to show itself, and then the wind will come back and cover the whole sky with clouds in ten minutes" (Ruskin 51). According to Ruskin, such cycles might continue "every half-hour, through the whole day; so that it is often impossible to go on with any kind of drawing in color, the light being never for two seconds the same from morning till evening" (51).

Finally, the plague-wind is presented as a phenomenon that resists scientific understanding and therefore cannot be resolved without appeals for divine intervention. "[T]he suddenness of its concentration, and the lifting and twisting strength . . . which make the blast fatal," Ruskin explains, cannot be "recognized by mechanical tests" (115).

Indeed, "the conditions of atmospheric change, on which depend the health of animals and fruitfulness of seeds, can only be discerned by the eye and the bodily sense" (Ruskin 113). Ruskin acknowledges that these subjective observations cannot adequately explain the cause of atmospheric decline, telling his audience: "If, in conclusion, you ask me for any conceivable cause or meaning of these things—I can tell you none" (61). By representing the plague-wind as something that defies scientific understanding, Ruskin suggests that it cannot be remedied through scientific means.

As Thorsheim points out, however, Ruskin does suggest a different solution: "[i]n his view, people had desecrated nature, and people had a moral imperative to undo the damage that they had caused" (56-57). But while Thorsheim is correct in noting that Ruskin's lectures are rife with the call to moral repentance, he fails to fully explore the implications that Ruskin's emphasis on a spiritual rather than secular solution to the "storm-cloud" have for understanding the late-Victorian approach to airborne toxins. According to Ruskin, "the promise of old time" and its wholesome skies would "be found to hold" for his countrymen once they regained "the paths of rectitude and piety" (63). Even as he proposes this answer to the country's atmospheric woes, Ruskin makes it clear that his solution will address symptoms of cultural rather than environmental decay: "[w]hether you can affect the signs of the sky or not, you can the signs of the times. Whether you can bring the sun back or not, you can assuredly bring back your own cheerfulness, and your own honesty" (63). By acknowledging that nothing else can be done, Ruskin suggests that man is powerless to improve atmospheric conditions directly and must rely instead on divine action by first bringing the proper "tithes into [God's] storehouse" and then waiting for the Lord to "open . . . the windows of heaven, and pour

. . . out [His] blessings" onto the blackened land (63). Ultimately, while the fact that Ruskin entertains the possibility of a remedy on its surface suggests that he views the environmental problem as one that can be resolved (or, to use the term broadly, contained), the spiritual nature of that remedy instead betrays a view of atmospheric decline as something that permits only a supernatural solution.

While Ruskin's lectures do not attack miasma theory explicitly, three of the four qualities that he ascribes to the plague-wind—its novel suddenness, erratic volatility, and resistance to scientific classification—suggest that the phenomenon he describes is both different from and appreciably more terrifying than miasma. Ruskin was hardly alone in abandoning miasma theory. Indeed, in the late nineteenth century, miasma theory was finally successfully undermined and replaced by the alternative framework offered by the germ theory of disease. While sanitarians claimed that miasma could be disinfected through the application of coal smoke, bacteriologists argued instead that because the germs responsible for the spread of disease are invisible and odorless, even seemingly fresh air might prove dangerous. Historians continue to debate the impact of germ theory on public health—some argue that the discovery of bacteria made little actual difference until antibiotics became available several decades later—but both camps suggest that germ theory led most late Victorians to ignore environmental conditions. As Thorsheim points out, however, "[t]he problem with this interpretation is that it focuses overly much on what physicians were doing and saying, while ignoring the ways in which sanitarians appropriated the germ theory in their ongoing struggle for relevance" (20). No longer crusading against decaying matter by lobbying for the construction of more elaborate sewer systems, sanitarians began calling for the abatement of coal smoke because so

doing gave them "a renewed sense of mission at a time when two forces—the growing professionalization of medicine and the germ theory—were forcing them to cede primary responsibility for the prevention of infectious diseases to physicians" (Thorsheim 20).

Rather than argue that both miasma and smoke were dangerous, sanitarians marshaled their considerable energy and the sophisticated understanding of the press they had gained while campaigning for the construction of the London sewer system toward demonizing coal. Some went so far as to recycle the same rhetoric; reformer William Napier Shaw, for example, famously described coal smoke as aerial sewage (Thorsheim 21). This conflation of biological and technological metaphors became so much a fixture of the sanitarians' attacks on coal that certain reformers began to warn of its potential to confuse the public. By the fin de siècle, most Victorians believed that the problem of dirty water that had so plagued them during the middle of the century had been either solved or at least sufficiently ameliorated with the construction of the sewer system. Presenting the coal smoke nuisance as an extension of the sewage problem, therefore, ran the risk of minimizing the former. In 1898, when asking reformer Thomas Coglan Horsfall for "a modest letter to the editor . . . pointing out that the race [for smoke abatement] is and will degenerate unless we maintain better conditions," *Spectator* editor Joe St. Loe Strachey cautioned Horsfall to avoid "use [of] the word 'sanitary' too much or indeed if possible at all, as the idiot publisher will think it means drains and cesspools and W.C.s and nothing else" (qtd. in Thorsheim 21).

While most reformers acknowledged that germs were linked to disease, sanitarians insisted that smoke simultaneously exacerbated bacterial virulence and rendered the body more susceptible to contagion. Alfred Carpenter, then president of the

British Medical Association, argued in 1879 that exposure to environmental toxins like smoke made the human body especially vulnerable to germs (Thorsheim 21). The president of the Sanitary Institute echoed the same view in 1898, explaining that "[i]t is not enough that we know the seed, but it is necessary that we should also know the nature of the soil, the meteorological and other conditions which determine whether it is to grow and multiply or to remain inert and harmless" (qtd. in Thorsheim 22). Ultimately, the sanitarians' willingness to adapt their tactics and supplement rather than attack germ theory meant that the "environmental theory of disease persisted, albeit in a form very different than in the past [as f]og, once feared because of the miasma it was thought to carry . . . became a concern because of its association with coal smoke" (Thorsheim 20).

Once it was abandoned by the sanitarians, the view that smoke could function as a disinfectant declined in popularity. While some, like Scottish physicist John Aitken, continued extolling the antiseptic properties of coal as late as 1880, the tide of expert opinion had turned. *The Lancet* was especially critical of smoke apologists, pointing out that the direct relationship between the concentration of coal smoke in the atmosphere and the incidence of disease in London suggested a causal rather than palliative relationship between the two (Thorsheim 22). In 1892, the *Spectator* similarly noted that while "[f]ormerly, there were always persons . . . able to inhale the disinfecting particles with which a London fog is charged, and to feel themselves the better for the experience . . . [n]o disinfecting action [could] be traced" to the city's most recent fogs ("London Fogs" 45-46). According to the *Spectator*, the reason for the change was obvious: even "[a] strong chest constituted no protection" against London's atmosphere because the "air had somehow ceased to be fit for human consumption . . . produc[ing] not cough merely,

but headaches, nausea, and other ordinary accompaniments of small doses of poison" ("London Fogs" 45-46).

Experts and journalists alike now blamed smoke for a host of health issues, including respiratory illnesses, rickets, and even vague complaints like dwindling stamina. Recognizing a link between industrial emissions and the transmission of tuberculosis, late-Victorian scientists began blaming smoke for facilitating the epidemic. Suggesting in 1882 that urban housewives should "close their doors and windows to the air that would," if left unchecked, "pour its heavy load of soot and noxious vapour into the houses," journalist Arthur Ransome illustrated the kind of logic that led to the "the encouragement, and, in many instances, the production of consumption" in overcrowded London homes (3). An airborne droplet infection, tuberculosis thrived in the low-altitude fogs that, comprised of sticky oil coated particulates, made skin and clothing efficient vectors for its transfer. Such transfer, in turn, only amplified anxieties about the unpredictable mobility of industrial emissions. Smoke was also thought to accelerate the spread of tuberculosis because it reduced the amount of sunlight available as a "universal disinfectant" (Chalmers 164-65). In 1881, Glasgow's Medical Officer of Health James Russell announced that "bacteria may be absolutely killed by sunlight," the disinfecting influence of which he said was "exactly proportioned to [its] duration and intensity" (qtd. in Chalmers 164-65). The claim was bolstered when, in the following year, Koch demonstrated that sufficient exposure to sunlight could kill the tubercle bacillus (Klebs 804).

The late-Victorian reconceptualization of smoke as a pollutant was also spurred by a contemporaneous upturn in mortality from respiratory illnesses. The incidence of

death attributable to cholera, typhus, and typhoid plummeted during the latter half of the nineteenth century even as bronchitis became the most common cause of death in England's factory towns, responsible for taking between 50,000 and 70,000 lives each year (Mosley 60). In 1881, John Tatham, the Medical Officer of Health for Salford, isolated smoke as a contributing cause of bronchitis and pneumonia when accounting for the improving health of rural Cheshire:

> [I]n Salford 598 people in every 100,000 of the population die annually of lung complaints, as compared with only 334 in Mid-Cheshire. . . . The conditions of life in this district are not superior to those in Salford, with the one exception that the atmosphere is less contaminated by smoke. The people generally are not more prosperous or better fed, and the climate is certainly not warmer . . . so that the extreme difference in mortality from respiratory disease may be assumed to be mainly if not entirely due to the smoke nuisance. (3)

Though lamented more vehemently, grime was in reality a less serious problem than the shortness of breath that afflicted many city dwellers. The prolonged nature of respiratory illnesses masked the fact that they had become major killers in urban areas even as mortality rates from bronchial conditions soared (Mosley 58-59). The inadequacies of urban sanitation compounded the problem. In his critiques of urbanization, G.M. Trevelyan aptly notes that "town planning, sanitation and amenity were things undreamt of by the vulgarian makers of the new world" (463). While life in the countryside was far from ideal, discrepancies in death rates between Victorian England's rural and industrial populations are staggering. In 1843, for example, laborers in rural Rutland had a life expectancy of thirty-eight years while in Liverpool that number was fifteen. Infants born in the cities fared no better: as late as 1891, only 78 percent of these children survived until their first birthday, while approximately 90 percent of their rural counterparts were as fortunate (Wohl 12).

By the final two decades of the nineteenth century, it was also speculated that smoke was responsible for making London inhospitable to many plant species that had been indigenous to the region before the Industrial Revolution. The so-called London Plane tree was selected to line the Thames Embankment, for example, specifically due to its capacity to adapt to the city's altered atmosphere (Porter 57). Animals were similarly affected: as the availability of sunlight waned, several species indigenous to the region disappeared. Others, like the peppered moth, were fundamentally changed. Until 1848, only one phenotype of the moth—white with a pattern of black markings across its wings—had ever been recorded in Europe. That year, a black variant was captured in Manchester and other examples of the same were soon observed throughout Lancashire, Yorkshire, and London (Majerus 217). By the 1870s, the white peppered moth had almost disappeared from the industrial cities. In 1895, 98 percent of Manchester's peppered moth population was black. "With only one generation per year, th[is] nearly complete reversal in phenotype frequency, from monomorphic pale to almost monomorphic black, was astonishingly rapid" (Grant 981). Although Victorian entomologists initially disagreed about the mechanism underlying melanism—some blamed the soot that moths absorbed while eating smoke-tinged foliage while others theorized that darker moths thrived because they could better conceal themselves against smoke-darkened trees—the link between progressive melanism and industry was not only undisputed but also frequently discussed. In 1877, biologist Nicholas Cooke summarized the prevalent fear that smoke was "carrying into effect the laws of creation before our eyes" (qtd. in Thorsheim 38). In 1896, entomologist James William Tutt successfully undermined the absorption theory, correctly arguing that melanism was attributable to the

interaction of sulfur dioxide, which killed the foliose lichens that had provided camouflage for the white moths, and soot fallout, which blackened remaining surfaces and thus allowed the black variety to thrive (Majerus 217). This recognition that the atmosphere was acquiring features not only inhospitable to life but also capable of transforming that life—either through contagion or melanism—further undermined the logic of containability and in so doing facilitated the late Victorians' recognition of coal smoke as an expansively degenerative phenomenon.

The abandonment of miasma theory and recognition of smoke's capacity to infect and transform organisms redefined airborne industrial emissions from a containable danger to pollution, which the Victorians perceived as a totalizing hazard that was continuously expanding the boundaries of its territory. By the fin de siècle, smoke appeared to erode the boundaries between objects, reducing the cityscape to a disordered, impenetrable mass and was frequently described as physically dominating the landscape. In 1888, a resident of Manchester's chief industrial district wrote that the sheer density of the atmosphere rendered it "impossible to see any object at a distance of a few hundred yards" (qtd. in Mosley 23). Moreover, the perception of smoke as an agent of disorder made it a resonant metaphor for "widespread anxiety about the future on many levels: economic, political, military, social, and even biological," concerns which were especially pervasive during the fin de siècle because "as the rate of [technological and social] change increased, society appeared to become less stable socially, culturally, and environmentally" (Thorsheim 41).

Consequently, smoke was seen as symbolic if numerous species of social degeneracy, ranging from individual crime to broader revolutionary unrest. As Thorsheim

notes, "[m]any middle-class commentators—obsessed with a supposed connection between darkness and crime—saw air pollution not primarily as a public health problem but as a catalyst and cloak for social disorder" (53). Tory jurist Frederick Pollock, for example, associated smoke—and not, as had the early and mid-Victorians, miasmatic fog—with increased "dangers to life and limb and property," noting that "plunder, either by stealth or violence" was easily accomplished behind the opaque veil of fog (qtd. in Thorsheim 53). In 1880, politician and meteorologist Francis Russell warned that "the presence of an overshadowing cloud of smoke produces moral evils" (31-33). According to Russell, the wealthier class's ability to escape the smoke of the cities, even if only temporarily, had the potential to escalate pre-existing class hostilities because "one thing for which, more than any other, the poor of London express envy of the rich is the power of going at any time 'to the country'" (31-33). Russell credited "smoke and bad air," more than any other factor, with creating "pallor, discontent, and ill-health" in the lower classes (31-33). Three years later, journalist Frank Harris went so far as to call smoke abatement and other measures aimed at improving the living conditions of the poor "an insurance paid by the rich against revolution" (596). Indeed, reformers calling for revolution employed precisely these tactics: libertarian socialist William Morris, for example, attributed the declining quality of urban air to "the present gospel of capital" (qtd. in Thorsheim 53). It is hardly surprising, therefore, that the late Victorians should be so profoundly disturbed by the "suggestion that pollution m[ight] inspire a revolutionary rejection of modern industry and the economic structures associated with it" (Thorsheim 54).

This appreciation of industrial pollution as uncontrollable and liable to make others vectors of physical illness or even social disorder surfaced in those areas of late-Victorian fiction and law that touched upon the problem of airborne toxins. In the next chapter, I will explore depictions of these emissions in late-Victorian detective fiction, arguing that the Holmesian logic so central to the genre should be understood as a kind of longing for stability in the face of the new and seemingly unpredictable hazard posed by pollution. In Chapter Three, I will show that a similar longing for stability shaped legal efforts to resolve the problem of airborne emissions, suggesting that—unable as they were to divorce calls for smoke abatement from their anxieties about smoke's uncontrollable and contagious nature—the late Victorians failed to consider practical solutions that they did entertain when dealing with problems that they perceived as inherently controllable. Finally, in Chapter Four, I will trace the relationship between pollution and the contagious vampire, a literary figure that the late-Victorians found as appealing as they did Holmesian logic, to examine what I see as Bram Stoker's decision to harness his readers' anxieties about pollution in *Dracula*.

CHAPTER TWO
Making Sense of Pollution Through Holmesian Logic

The ends of centuries, Elaine Showalter notes, "seem not only to suggest but to intensify crises," and it is at such "periods of cultural insecurity" that fears about degeneration and regression prompt "the longing for strict border controls" around conceptual constructs (2). In Chapter One, I characterized those fears of regression as anxieties about what I called entropic degeneracy, arguing that they proved central to the late-Victorian redefinition of smoke from a localizable inconvenience to an ever-expanding pollutant. In the remainder of the project, I will explore the impact of these anxieties on the treatment of pollution in late-Victorian fiction and law. With respect to the former, I am especially interested in representations of both literal and metaphoric pollution in late-Victorian detective and Gothic fiction. I focus on these two genres not only because the height of their popularity coincided with the emergence of pollution as a conceptual category, but also because anxiety about entropic degeneracy largely contributed to that popularity.

I will begin this chapter by suggesting that, by containing the proliferation of multiple possible storylines and privileging one story above others, narrative functioned similarly in late-Victorian fiction and law as a means of imposing longed-for order on what was perceived as an increasingly chaotic universe. The late Victorians were so drawn to the detective fiction of Arthur Conan Doyle precisely because, in relying on Holmesian logic as the principle of meaning-making in the Holmes stories, Doyle creates a reassuringly ordered universe which promises that even the most baffling of clues can be assigned a comprehensible value. A comparison between the Holmes stories and *The*

Poison Belt will suggest that Doyle saw industrial emissions as posing a unique threat to Holmesian logic because, understanding pollution as an ever-expanding and unlocalizable phenomenon, he knew that it could not be ascribed a neat Holmesian meaning without first being recast as an entirely different substance. It is only in reinterpreting local pollutants as foreign poisons that Holmes can make sense of smoke and thus satisfy the demands of Holmesian logic. But while Doyle allows his protagonist to conflate industrial pollutants and foreign poisons so as to prevent the multivalent threat of pollution from undermining the integrity of Holmesian logic, M.P. Shiel goes further still in "The Race of Orven" by exploring what happens to a Holmesian narrative when it is confronted by a phenomenon that successfully resists Holmesian interpretation.

Part I: Imposing Order Through Narrative in Victorian Fiction and Law

Late-Victorian attempts to address anxieties about entropic degeneracy through law and fiction can be understood as the culmination of two centuries of sustained literary focus on the legal process. While the relationship between law and narrative began much earlier, it flourished during the rise of the novel in the eighteenth century due to the budding genre's instrumentality in helping to define the individual subject and its subsequent fascination with state intervention into that subject's private life. That fascination was often expressed quite literally: numerous eighteenth-century novels describe one or several stages of the legal process. A study limited to these direct representations, however, would fail to capture a far more structural interdependence among narrative, law, and fiction. Narrative is, at its most basic, a process of ordering. The act of imposing a narrative on raw material, be it a society's collective experience or

one author's invention, can be understood as a method of interpreting and making sense of what is, without its bounds, an undifferentiated mass of multivalent clues. That mass is at once meaningless and infinitely meaningful, a collection of symbols bound to no particular context. I have thus far avoided an emphasis on language because, as anyone who has heard a Beethoven symphony or seen a Caravaggio canvas can attest, language enjoys no monopoly over narrative. For the sake of leaving this analysis unencumbered by repetitive qualification, however, I will take narrative to mean that iteration of it that is facilitated by language only because both law and fiction, the instruments for producing narrative that are at the center of this inquiry, are rooted there.

The proposition that narrative is a process of ordering is hardly new. In "*Nomos* and Narrative," Robert M. Cover argues that "[t]he codes that relate our normative system to our social constructions of reality and to our visions of what the world might be are narrative," going on to define the act of creating narrative as the "imposition of a normative force upon a state of affairs, real or imagined" (10). Gerald Prince has also noted that narrative, "through providing its own brand of order and coherence to (a possible) reality . . . effects a mediation between . . . what is and the desire for what may be" (60). Kieran Dolin expands on these arguments to emphasize narrative's unique ability to "link abstract ideas to concrete circumstances; to represent or objectify in language both current and possible worlds; and to enable the representation of time and change" (11).

While the self-evident premise that fiction involves the production of narrative needs no support, law may not immediately seem to be inescapably narrative. To reach that conclusion, we should begin with Richard H. Weisberg and Jean-Pierre Barricelli's

assertion that "[l]aw is associated with [l]iterature from its inception as a formalized attempt to structure reality through language" (150). James Boyd White has gone further to call law itself a language, likening it to a narrative enterprise (78-79). Cover also points to an interdependence between law and narrative, arguing that "no set of legal institutions or prescriptions exists apart from the narratives that locate it and give it meaning" (4). For Cover, law and the narratives associated with it create what he calls a *nomos*, the "normative universe . . . of right and wrong, of lawful and unlawful, of valid and void" (4).

I intend to go further still by suggesting that law is not only a language or merely dependent on narrative, but rather that it is a strategy for the production of narrative and that, like any strategy, it pursues identifiable (if never wholly attainable) goals. Unlike fiction, through which narrative is generated by an individual writer who is most often working alone, law's production of narrative is at once a communal and a community-reinforcing enterprise. Fiction does, of course, possess the capacity to fortify social norms; indeed, the novel as a genre is particularly suited to that task. Dolin persuasively argues that the genre's reliance on omniscient narration, analogy, and focalization can be understood as "formal experiments in the creation of consensus" (18). This facilitation of inclusion, however, is of a different order than the consensus demanded by law. While fiction can reinforce preexisting values, its success does not directly depend upon or enforce simultaneous mass consumption. Law, on the other hand, is predicated on the existence of a group willing to obey and enforce it. Law constitutes "the quintessential form of the symbolic power of naming, that creates the things named, and creates social groups in particular" (Bourdieu 838). These social groups are created by exclusion; the

"we" that uses the instrument of law to generate narrative "designates any group that consents to the law and whose self-believed stories about the world are invested with judicial approval, in consequence of which other groups with other versions of reality are constructed as outsiders, and their stories excluded" (Dolin 13). Courts, in turn, function as checks on the proliferation of communal law-making by "surpress[ing] the multiplicity of voices claiming the sanction of the state for their visions" (Dolin 14). Civil disobedience—and indeed all criminal activity—signals a "commitment to an alternate vision of *nomos*, which depends not only on meaning but on action" (Dolin 14). Not only, then, is law a strategy for the production of narrative, but it is also a means of crafting a particular kind of narrative: one that is communal, exclusive, and inevitably aspirational.

The comparison of law and fiction as two processes of linguistic ordering through narrative is hardly the only basis for asserting a relationship between them. During the eighteenth and nineteenth centuries, the two discourses not only retained their structural similarities but also became newly interdependent, a development elided by scholars who emphasize the modern separation of the two fields. R. Howard Bloch, for example, argues that the language of literature "has since the Renaissance become increasingly synonymous with a discourse emanating from and belonging to a personalized self: the product variously of inspiration, imagination, desire, neurosis, dream" (1). Bloch distinguishes the language of law, on the other hand, as representing "the collective discourse governing relations between individuals or between individuals and the state" (1). According to Bloch, where fiction "stands as a vehicle for the expression of the private and the particular," law "serves as a mechanism for their regulation" (Bloch 1). But while Bloch's characterization may ring true today, the boundary between the private

and the public was too porous during the eighteenth and nineteenth centuries to support so clear a dichotomy. To the contrary, the rise of the novel itself helped blur that boundary, partially conflating the discourses of law and fiction. John P. Zomchick, who traces the construction of a self-regulating juridical subject in the eighteenth-century novel, persuasively characterizes law and novels as critical parts of the collective consciousness of English society (2). He suggests that, while novels of the period assert the integrity of the private sphere by allowing their protagonists to retire from a hostile public sphere, the characters never leave that sphere behind entirely and so inevitably carry into their private lives the ideas and modes of behavior that have facilitated their survival in public (18). It is in constantly traversing this boundary between the private and the public that the early novel rooted itself in the shadow of juridical influences.

Perhaps the strongest of these influences was the logic of circumstantial proof, which can broadly be described as narration through inference. As Ian Watt points out, the novel's attempt to imitate reality can be "summarized in terms of the procedures of another group of specialists in epistemology, the jury in a court of law," whose expectations largely coincide with those of the leisured novel reader (31). Both groups, after all, want the particulars of a given case and expect witnesses to recount those particulars of the story in their own words. It is hardly surprising, therefore, that "canons of legal evidence [should have] come to govern the practice of fictional storytelling" throughout the eighteenth and nineteenth centuries (Dolin 2). Alexander Welsh, whose *Strong Representations: Narrative and Circumstantial Evidence in England* traces the effect that changing notions of proof had on both law and literature, also suggests a link

between the development of a legal category of circumstantial proof and the increased popularity of third-person narrative point of view during the eighteenth century.

Additionally, the material conditions governing popular consumption of crime literature during the nineteenth century made the boundary between narratives of law and fiction even more porous. First, the news/novels discourse of crime fiction conflated the real with the imagined by basing plots on widely-circulated reports of criminal activity. The advent of serial publication further exacerbated this phenomenon by preventing readers from "enter[ing] into an imaginary world and remain[ing] there until the story's end" (Hughes 8-9). Even while in the midst of the reading experience, Victorians were continually confronted with reminders of the external world because novels issued in monthly installments were routinely framed by advertisements and news stories (Hughes 8-9). Forced to repeatedly exit and reenter the fictional world, readers were asked to occupy two logical registers simultaneously, at once immersed in an invented story of crime and reminded of a local robbery described in an adjacent article. This feature of nineteenth-century crime fiction complicates what is already an intricate relationship between law and fiction and in so doing creates a fertile ground for analysis. The remainder of this chapter will focus on the latter genre, characterizing the Holmesian logic operating in late-Victorian detective fiction as a kind of narrative ordering and explaining its popularity as a reaction to anxieties about entropic degeneracy.

In using the term, I do not mean to suggest that Holmesian logic is exclusively or even originally Holmesian. Doyle cannot be credited with inventing Holmesian logic any more than he can be credited with conceiving the detective genre from which it springs. That accolade belongs to Edgar Allan Poe, who introduced readers to the eccentric C.

Auguste Dupin in "The Murders in the Rue Morgue" in 1841. But while Victorian novelists like Charles Dickens and Wilkie Collins used Poe's detective as a blueprint for their own investigators, it took Holmes to catapult the genre—and the interpretive strategy it championed—to unprecedented levels of popularity.

Part II: Understanding the Popularity of Holmesian Logic as a Longing for Order in the Face of Entropic Degeneracy

Before exploring the relationship between Holmesian logic and the popularity of the Holmes canon, it will be helpful to define the former. As a genre, late-Victorian detective fiction is predicated on the capacity to associate a finite and proportional meaning with any given clue. In the canon, for example, Doyle draws direct and immutable relationships between objects and their significance in the plot. Each clue has a unique well-defined purpose, a calculus which satisfies readers' subconscious longing for order and stability. This one-to-one relationship between a clue and its meaning enables Holmes to resolve mysteries methodically, creating one incontestable storyline from what his audience perceives as a baffling array of seemingly arbitrary details.

The storylines born of Holmesian logic, while incontestable, are hardly infallible. As Franco Moretti points out in "The Slaughterhouse of Literature," Holmes's inferences at times make little logical sense (215). In "The Adventure of the Speckled Band," for instance, Holmes accurately hypothesizes that the murderer had, through the application of milk as a reward, trained an Indian "swamp adder" to climb a bell cord on audible command (SPEC, Vol. 1, 259). As Russell Miller notes, however, the premises underlying Holmes's conclusion are untenable: "[t]here is no such reptile as a 'swamp adder', there are no adders in India, snakes do not like milk, are completely deaf, and no

snake could climb a bell pull" (147). But like any Holmesian premise, Holmes's illogical inferences in "The Adventure of the Speckled Band" prove entirely accurate within the Holmesian universe. There, and consistently throughout the canon, the meaning Holmes assigns to each clue, however implausible, is ultimately revealed as precisely—and uniquely—correct.

Based as it was on a strictly proportional ratio between a clue and its meaning, Holmesian logic provided an appealing conceptual solution to anxieties about entropic degeneracy. As the appeal of that solution contributed to the remarkable popularity of the Holmes stories, it will be useful to trace the growth of that popularity in the context of late-Victorian anxieties. Holmes first entered the Victorian imagination in 1887 when, after numerous rejections, Doyle published *A Study in Scarlet* in *Beeton's Christmas Annual* magazine. While the story garnered little public attention and did nothing for Doyle's finances, it did provide an effective introduction not only to Holmes and Watson, but also to the "revolutionary forensic methodology" they employed (Weller 11-12). Doyle did not revisit the Holmes character until 1889, when literary agent J.M. Stoddard encouraged him to submit a new novel. The meeting prompted the publication of the long story, *The Sign of Four*, and, the following year, the composition of the twelve tales that would eventually comprise *The Adventures of Sherlock Holmes*. It was this collection that introduced Holmes to the broader public. In 1891, Doyle enjoyed a successful series of collaborations when his stories in *The Strand Magazine* were accompanied by the illustrations of Sidney Paget. These portraits fixed the physical image of Holmes in the imagination of his readers, many of whom were becoming avid fans of the detective.

As Philip Weller points out in *The Life and Times of Sherlock Holmes*, Doyle's protagonist appealed to late-Victorian audiences because he represented "a completely new type of lead character: a private, consulting detective who produced amazing results through the application of a keen, analytical mind to the careful observation of the clues available" (11). Moreover, the serialization of multiple Holmes stories imbued the detective with a seeming extra-textual authenticity. Holmes's creator, however, was less impressed. Doyle never viewed the stories as particularly accomplished literature, and his annoyance with the public's infatuation with the tales prompted him to kill off Holmes in "The Final Problem." The story, which first appeared in the Christmas 1893 issue of *Strand Magazine*, devastated the public to an unprecedented degree. Many Londoners mourned the death of their fictional icon by donning black armbands, while numerous others went so far as to send Doyle threats and letters of abuse (Weller 11). It would take another eight years for Doyle to succumb to popular pressure by publishing *The Hound of the Baskervilles*, which he set in the years prior to the detective's demise. By Doyle's death in 1930, the Holmes canon included four novellas and fifty-six short stories. While many enthusiasts considered those stories that were written after *The Hound of the Baskervilles* to be inferior in quality, the detective's popularity did not falter.

The immense success of the Holmes stories is a testament to their resonance with Doyle's contemporaries, who were attracted to the detective's methodology of meaning-making through ordering. The Holmesian approach was reassuring because, premised on the identification of discrete relationships between symbols and their referents, it implied that the world could successfully be ordered given sufficient investigatory skill. A contemporary of his late-Victorian audience, Doyle's detective was a manifestation of

their desire for conceptual stability, an example of an Englishman logically and successfully navigating the chaotic and teeming urban landscape with thoroughly modern—and ordinarily accessible—investigative tools. Holmes goes a step further, ordering that landscape as he traverses it, thus making its contours comprehensible even to those who lack his deductive acumen. The detective's function is repeatedly presented as analogous to that of a physician who diagnoses and neutralizes the harmful properties he encounters during his investigations.

Doyle's protagonist was an ardent and accomplished student of science. Holmes's bias in favor of scientific objectivity owes a great deal to his creator's own background. A general-practice physician, Doyle studied medicine at the University of Edinburgh under Robert Christison, who is now best remembered as one of the founders of toxicology. While the reasoning Doyle employs in his 1885 doctoral thesis on *tabes dorsalis* unquestionably betrays Christison's influence, some scholars have gone further to suggest that the author patterned Holmes's forensic skills on those of his own mentor. Alvin Rodin, for example, argues that Christison's presence is especially discernible in the early Holmes stories. He traces the detective's practice of "beating the subjects in the dissecting room with a stick" so as to "verify how far bruises may be produced after death" for instance (Doyle, STUD, Vol. 3, 19), to Christison's account of the same experiment in the 1829 issue of the *Edinburgh Medical and Surgical Journal* (Rodin 16).

It is hardly surprising, therefore, that Holmes should enjoy so thorough a footing in the sciences. In the first pages of *A Study in Scarlet*, Watson helpfully enumerates "all the various points upon which [Holmes] had shown . . . that he was exceptionally well-informed" (STUD, Vol. 3, 34). He notes that, while the detective has only a "feeble"

knowledge of politics and no familiarity with high literature, his understanding of chemistry is "profound" and that he displays an "[a]ccurate, but unsystematic" knowledge of anatomy (STUD, Vol. 3, 34). Holmes is also said to have a "practical" comprehension of geology; able to distinguish "at a glance different soils from each other," he can trace the "splashes upon his trousers" to the "part of London [where] he . . . received them" by scrutinizing their "colour and consistence" (STUD, Vol. 3, 34). Finally, though Holmes "[k]nows nothing of practical gardening," his botanical knowledge about "belladonna, opium, and poisons generally" is described as being remarkably extensive (STUD, Vol. 3, 34).

Even as he allows Watson to catalog his protagonist's abilities, Doyle is careful to present Holmes's skills as finite. When Watson is astonished to find Holmes "ignorant of the Copernican Theory and of the composition of the Solar System," the detective responds that he will do his "best to forget" that fact now that he knows it (STUD, Vol. 3, 32). Characterizing a man's brain as a "little empty attic," Holmes explains that only a "fool takes in all the lumber of every sort that he comes across, so that the knowledge which might be useful to him gets crowded out, or . . . is jumbled up with a lot of other things, so that he has a difficulty in laying his hands upon it" (STUD, Vol. 3, 34). A "skillful workman," on the other hand, "is very careful indeed as to what he takes into his brain-attic" and "will have nothing but the tools which may help him in doing his work . . . and all in the most perfect order" (STUD, Vol. 3, 32-34). Holmes goes on to say that "[i]t is a mistake to think that that little room has elastic walls and can distend to any extent," concluding that "there comes a time when for every addition of knowledge you forget something that you knew before" (STUD, Vol. 3, 34). Holmes revisits this same

argument in "The Reigate Squires," where he claims that "[i]t is of the highest importance in the art of detection to be able to recognize out of a number of facts which are incidental and which are vital," lest one's "attention and energy" are "dissipated instead of being concentrated" (REIG, Vol. 1, 575). This emphasis on the precise ordering of finite elements demonstrates not only Holmes's rationality but also his willingness to privilege only one interpretation of facts over other possible storylines.

Doyle's affinity for finite, utilitarian knowledge owes a great deal to his scientific training and, more broadly, to a late-Victorian culture that simultaneously feared and fetishized whatever it itself labeled as modern. As Michael Saler notes, the concept of modernity that emerged during the fin de siècle "was widely associated with progress towards the rational and away from the supernatural" (602). Indeed, during the final decades of the nineteenth century, "efforts by believers to impart the veneer of scientific respectability to the supernatural were frequently greeted with skepticism if not outright disdain by contemporary commentators" (Saler 602). In this fraught social climate, Holmes's reliance on scientific rather than paranormal solutions casts him as a champion of modernity. To the late Victorians, the character "represented and celebrated the central tenets of modernity adumbrated at the time—not just rationalism and secularism, but also urbanism" (Saler 603). According to Saler, "[t]he stories made these tenets magical without introducing magic" by demonstrating "how the modern world could be re-enchanted through means entirely consistent with modernity" (603). Even as he admitted a "love of all that is bizarre and outside the conventions and humdrum routine of everyday life," Holmes could satisfy his sense of wonder by embracing modernity, having concluded that "for strange effects and extraordinary combinations [one] must go

to life itself, which is always far more daring than any effort of the imagination" (REDH, Vol. 1, 42).

Though he applauded the virtues of the modern world through Holmes, Doyle himself was not entirely blind to its drawbacks. To the contrary, Doyle described London's social and environmental problems realistically and in so doing accurately reflected complex contemporary attitudes about urbanization. Closely related to "the condition of England" question, the nineteenth-century debate about urbanization was "cyclical, with the pros and cons alternatively dominant about every twenty to twenty-five years" (Hoffman 82). During the mid-century, for example, many writers viewed urban centers somewhat more positively as economic prosperity and a growing familiarity with urbanization alleviated lingering Romantic fears about industrialization. By the 1880s, however, the debate turned again as "depression, mass demonstrations in Hyde Park and Trafalgar Square, strikes, serial murders, socialism, foreign radicals, and mass poverty threatened the security and values of middle-class England" (Hoffman 83). The hysteria reached so high a pitch that many West End Londoners feared violent revolution and even invasion from their neighbors in the East End. By the 1890s, fears of anarchy abounded, prominent intellectuals described conditions in the city as foreshadowing the downfall of English civilization, and poets routinely described the capital as an abyss, coffin, vortex, and tomb (Hoffman 83).

Even as he depicted Holmes encountering those seedier facets of London that gave others cause to condemn the city, Doyle had his detective remain optimistic about urbanization. Consequently, though the Holmes stories as a whole accurately reflect the ambivalence with which many Victorian intellectuals regarded urbanization throughout

the nineteenth century, it is naive Watson and not Holmes who represents the pessimistic view of city life. A self-proclaimed nature enthusiast who longs for "the glades of the New Forest or the shingle of Southsea" (RESI, Vol. 1, 631), Watson describes London as "that great cesspool into which all the loungers and idlers of the Empire are irresistibly drained" (STUD, Vol. 3, 14). Holmes, meanwhile, champions the opposing view. Though equally capable of appreciating the countrysides of England, the detective does not sentimentalize the tranquility of the natural world, warning Watson about the isolation and attendant dangers of life in the country. Holmes, in fact, adeptly flips the association between urbanization and iniquity on its head, arguing "that the lowest and vilest alleys in London do not present a more dreadful record of sin than does the smiling and beautiful countryside" (COPP, Vol. 1, 363). Doyle makes it abundantly clear that it is in the city and not the country where Holmes feels most comfortable. He is said to enjoy "the roar of central London" (3GAB, Vol. 2, 1548) and to "love to lie in the very centre of five millions of people" (CARD, Vol. 1, 423). Embracing urbanization, Holmes perceives London as not only better than the country, but also vibrant, exciting, and brimming with untapped economic potential.

Part III: Othering Local Pollutants as Foreign Poisons in the Holmes Stories

Because Holmes not only embraces the values of modernity but also explicitly counters the criticisms of cultural pessimists, through him Doyle is able to simultaneously amplify the hopes and mollify the fears of his audience. In solving modern problems with equally modern solutions, he demonstrates that modernity can successfully neutralize many of its own unpleasant consequences. Pollution, however, proves to be a noteworthy exception to this rule, and as such threatens to undermine the

comforting fiction that Holmesian logic has the capacity to resolve every puzzle through the application of a one-to-one ratio between clues and their meanings.

In Chapter One, I argued that many late Victorians perceived airborne pollution as an ever-expanding and chaotic phenomenon. This conception of pollutants as chaotic and unbounded was conceptually at odds with Holmesian logic's insistence on a bounded and knowable universe governed by identifiable one-to-one relationships between a thing and its meaning. Because pollution could not be ascribed a finite meaning, it was not susceptible to the kind of neat solution favored elsewhere in the canon. Pollution, therefore, posed a challenge for Holmesian logic, and in so doing a problem for Doyle's storytelling efforts. Doyle could have addressed this problem in any one of three ways. The first option—omitting mention of harmful gases in the Holmes stories entirely—was rendered implausible by Doyle's choice to set so many of them in smoky nineteenth-century London. Alternatively, while Doyle could have acknowledged pollution as a phenomenon that resisted definition, so doing would have undermined the purported infallibility and universal applicability of Holmes's method. What remained, therefore, was the option of recasting pollutants as something more amenable to Holmesian logic. This precisely is the strategy that Doyle has his protagonist employ when faced with those negative effects—namely unsightly smog and smoke's capacity to render Englishmen vectors of disease—that late Victorians were beginning to attribute to industrial pollutants.

Holmes breaks with his contemporaries by attempting to anachronistically explain these problems in the context of miasma theory. The approach is surprising because Doyle's readers were among the first generation of Victorians to perceive smoke as a

pollutant that was not only unpleasant but also threatening insofar as it transformed pedestrians into mobile vectors of droplet-borne infections. As miasma theory gradually gave way to the microbial theory of disease, Doyle's audience reconciled itself to the notion that invisible and as yet uncontrollable germs were the true culprits in the proliferation of disease. Abandoning the belief that smoke possessed antiseptic properties, the late Victorians began perceiving it as unredeemable. Given this shift away from miasma theory, Doyle's decision to have his otherwise modern and scientifically-minded protagonist cling to miasma theory so vehemently is particularly intriguing. Critics like Susan Cannon Harris have likewise drawn attention to this odd feature of the Holmes stories, noting that "[d]espite medical advances of which he [was] well aware, Doyle [was] unwilling to give up the miasmatic conception of disease" within the confines of the Holmes canon (457).

Harris's word choice is apt: Doyle was unwilling rather than unable to abandon miasma theory. As I will argue later in this chapter, Doyle fully embraces pollution theory in his 1913 novella, *The Poison Belt*. Indeed, Holmes is Doyle's only protagonist to cling so fervently to miasma theory. This incongruence suggests that Doyle's decision to represent his detective as a miasmatist is not only deliberate but in fact mandated by the internal logic of the Holmes canon. Where pollution could not be adequately explained through the application of Holmesian logic, miasma theory was compatible with a worldview premised on the assumption that one-to-one relationships between clues and their meanings is possible. In a world governed by miasma theory, noxious gases and the diseases they caused could be traced to discrete sources, something that could not be accomplished through the prism of pollution theory because, while miasma

could easily be understood as springing from identifiable and theoretically sanitizable locations, the multiple smokestacks problem I will explore in Chapter Three made it impossible to either attribute toxins to particular sources or control their proliferation.

Consequently, rather than ground his protagonist's analysis in the scientific facts the detective champions so consistently elsewhere, Doyle has Holmes recapitulate the tenets of miasma theory. Like other miasmatists before him, the detective addresses the problem of unsightly smog by recasting it as a net positive. Where earlier proponents of miasma theory deemed smoke a net benefit due to its purported antiseptic qualities, Holmes employs a similar strategy by reading smog as evidence of England's economic progress. Doyle presents Holmes's interpretation of smog as superior to that of Watson, who embraces the predominant late-Victorian perception of smoke as a net negative, in order to discredit that competing reading. As the presence of Watson's interpretation demonstrates, Doyle has Holmes adhere to miasma theory neither for lack of alternatives nor as a result of some general ignorance about pollution on the part of the author.

On the contrary, even as Holmes reinterprets some effects of smog as beneficial and misattributes others to miasma, Doyle betrays a thoroughly modern understanding of the origin and development of smogs. Indeed, some historians have cited the Holmesian stories as being particularly valuable to our current understanding of the nineteenth-century pollution problem. While the frequency of London fogs can be estimated with some success based on early meteorological records, those records fail to specify the location of fogs within the capital. It is only through literary sources like the Holmes stories that a somewhat fuller picture emerges, suggesting that fogs and particularly smogs usually hovered above those parts of the city where industrial activities—and the

resultant smoke—were most concentrated. This link between industrial centers and high smog levels is most noticeable in *The Sign of Four*, where Doyle describes Holmes, Watson, and Lady Morstan as surrounded by smoky fog when they travel to Upper Norwood, but later notes that the air is markedly clearer by the time the group has passed industrialized Norwood (SIGN, Vol. 3, 240-43).

Doyle further demonstrates his understanding of pollution by conceding, as did many of his contemporaries, that the smoke produced in the capital has noticeably unpleasant effects on the city. But Doyle deliberately takes note of these effects through Watson, thereby freeing Holmes to perceive industrialization through anachronistically rose-tinted glasses. In "Naval Treaty," when the pair pass through Clapham Junction on their way back to the capital, Holmes declares it "a very cheery thing to come into London by any of these lines which run high and allow you to look down upon the houses" (NAVA, Vol. 1, 688). Watson perceives the same vista much differently and concludes that Holmes must be joking because where the detective deems "big, isolated clumps of buildings rising up above the slates, like brick islands in a lead-coloured sea" cheerful, he finds the view thoroughly "sordid" (NAVA, Vol. 1, 688). Similarly, in *A Study in Scarlet*, it is Watson who notes the "dun-coloured veil [hanging] over the house-tops" near Brixton Road, describing it as "the reflection of the mud-coloured streets beneath" (STUD, Vol. 3, 51). Holmes, meanwhile, regards the same scene with "the best of spirits . . . prattl[ing] away about Cremona fiddles, and the difference between a Stradivarious and an Amati" (STUD, Vol. 3, 51). Doyle further emphasizes this difference in perspectives by pointing out that while the "dull weather" has seemingly no effect on Holmes, it thoroughly depresses Watson's spirits (STUD, Vol. 3, 51).

Holmes, on the other hand, finds smog unpleasant not for its own sake but only insofar as it alters his daily routine. "The Adventure of the Bruce-Partington Plans," for example, begins with Watson's account of the "dense yellow fog" that had blanketed London for several days and had made it impossible "to see the loom of the opposite houses . . . from [the] windows in Baker Street" (BRUC, Vol. 2, 1300). While he calls it fog, Watson's description of the phenomenon as a "greasy, heavy brown swirl . . . drifting past . . . and condensing in oily drops upon the window-panes" positively identifies it as smog (BRUC, Vol. 2, 1300). But where Watson dwells on the unpleasant sensory effects of this "drab existence," Holmes "pace[s] restlessly about [the] sitting-room in a fever of suppressed energy, biting his nails, [and] tapping the furniture" (BRUC, Vol. 2, 1300). Doyle makes it clear that, when the detective's attention is otherwise occupied, Holmes is not bothered by the same vista that depresses Watson. We learn that "[t]he first day Holmes had spent in cross-indexing his huge book of references. The second and third had been patiently occupied upon a subject which he had recently made his hobby—the music of the Middle Ages" (BRUC, Vol. 2, 1300). It is only after several days that the detective's "impatient and active nature" leaves him "chafing against inaction" (BRUC, Vol. 2, 1300).

When Holmes does finally pause to consider the smog, however, he views it much differently than Watson. While the latter perceives the smoky veil as an ominous presence that inhibits action and keeps the pair stranded in their office, Holmes imbues it with the potential to rescue him from his boredom. Urging Watson to peer into the smog again, the detective notes how the figures submerged in it "loom up, are dimly seen, and then blend once more into the cloud-bank" (BRUC, Vol. 2, 1301). Holmes immediately

associates the obscure vista with the possibility of criminal activity, reasoning that "[t]he thief or the murderer could roam London on such a day as the tiger does the jungle, unseen until he pounces, and then evident only to his victim" (BRUC, Vol. 2, 1301). The possibility of criminal activity, in turn, offers a chance to alleviate boredom. When Watson mentions that the smog has facilitated many petty thefts, Holmes "snort[s] his contempt," suggesting that "[t]his great and somber stage is set for something more worthy than that" (BRUC, Vol. 2, 1301). By "worthy," the detective presumably means worthy of his expert investigatory skills. But Doyle has Holmes go further still to re-characterize the climate yet again. First seeing the smog as a catalyst for crimes he can solve, Holmes then remarks that "[i]t is fortunate for [the] community that [he] is not a criminal" (BRUC, Vol. 2, 1301). With his considerable talents, he reasons, he could easily "survive against [his] own pursuit" and evade capture indefinitely (BRUC, Vol. 2, 1301). Holmes concludes the train of thought by explicitly linking the smog to murder in particular, deeming it "well they don't have days of fog in the Latin countries—the countries of assassination" (BRUC, Vol. 2, 1301).

Like most discussions of urban pollution in the canon, the brief exchange between Holmes and Watson at the start of "The Adventure of the Bruce-Partington Plans" has little to no bearing on the story that follows. It does, however, allow Doyle to highlight the uniqueness of Holmes's approach to pollution by placing it in conversation with Watson's more predictable late-Victorian aversion to smoke. Where Watson reacts to smog by complaining about its depressing effects, Holmes re-characterizes the phenomenon not only as a means of alleviating boredom but also as fodder for his active imagination. Like earlier generations who lauded smoke as a miasma disinfectant even as

they acknowledged the inconvenience it sometimes occasioned, Holmes is able to first recognize the atmosphere as "somber" and then to perversely reinterpret it as a net benefit (BRUC, Vol. 2, 1301). The contrast Doyle draws between Watson and Holmes in their respective approaches to pollution illustrates the way that the detective views the airborne emissions lamented by his contemporaries abnormally, as merely another opportunity to practice his skill.

Pollution within the Holmes canon is reduced to a puzzle, the implication being that, like any clue inviting multiple interpretations but permitting only one correct reading, it too can be definitively understood through the application of Holmesian logic. While it can be argued that Holmes treats every phenomenon as a puzzle, his conclusions with respect to pollution are surprising and consequently worthy of critical attention. First, Holmes reacts to the visible and undeniable evidence of local smoke by reinterpreting the London smog as a symbol of unadulterated economic progress at a time when most Londoners—including Watson—had at best a mixed opinion of it. Even more bizarrely, Holmes then embraces miasma theory and ascribes to poisons the specter of contagion associated with industrial pollutants so as to interpret local and ever-expanding industrial emissions as not only localizable but also as reassuringly foreign.

By having his protagonist ascribe beneficial qualities to smog at a time when many echoed Watson's concerns, Doyle first makes it clear that the correct reading of smoke within the Holmes universe is a favorable one. To that end, he presents Holmes as a surprisingly vehement champion of not only industry generally but also of its airborne emissions in particular. In discussions with Watson, the detective often betrays an abiding optimism about smoke by characterizing it as evidence of English advancement. When

looking at the soot-stained rows of terrace houses and schools in "Naval Treaty," for example, Holmes tells the worried Watson that, rather than lament the visible signs of pollution, he should instead see the schools as "light-houses, my boy! Beacons of the future! Capsules with hundreds of bright little seeds in each, out of which will spring the wiser, better England of the future" (NAVA, Vol. 1, 688). The detective reinterprets the obvious drawbacks of industrial emissions as emblems of not only immediate but also as yet unrealized progress. Admittedly, Holmes's optimism about industrialization hardly makes him an outlier. But although many late Victorians were hopeful about England's economic prospects, the detective's willingness to embrace smoke without reservation was relatively unusual by the fin de siècle.

While Holmes responds to the aesthetic problems of smog by reading the phenomenon as a net benefit, his willingness to interpret it favorably does not address smoke's ability to change Englishmen into vectors of disease. Miasma theory is ill suited to addressing pollution's capacity to transform urbanites into carriers of contagion because its appeal rests on the notion that sources of disease could be localized beyond the city. As I suggested in Chapter One, miasma theory was reassuring insofar as it posited that swamps, marshes, sewage, and other sources of disease-causing fumes either already existed outside the cities or else could be relocated there. The late-Victorian recognition that smog could transform individuals into mobile loci of disease implicitly challenged one of the central premises of miasma theory. Consequently, Holmes faces a dilemma. Unwilling to accept pollution theory because it would undermine Holmesian logic, he is left to explain the phenomenon of urban disease vectors within the context of miasma theory.

Doyle accomplishes this by imbuing organic poisons with the same anxieties about contagion that the late Victorians associated with pollutants, thus making poison a proxy for smoke within the Holmes canon. By disproportionately relying on exotic poisons like datura rather than on equally toxic European plants like Belladonna, Doyle suggests that poison is miasma made manifest, a mechanism for transporting the organic dangers of the tropics into England. This pattern of transmission is perhaps best illustrated in *The Sign of Four*, where a British subject traveling in the tropics encounters a foreign culture that routinely makes use of local organic poisons. He returns to England with the substance and proceeds to use it on an English victim, who promptly falls ill. Much like smog, which refashioned Londoners into vectors of illness, poison transforms the poisoner into a vector of disease. Unlike an unsuspecting pedestrian, however, the poisoner is ultimately less threatening because he represents a single morally culpable agent that can successfully be identified and impeded by a capable investigator. In poison, Doyle is able imbue miasma with smog's frightening capacity to transform Englishmen into vectors of disease. As such, poison becomes an proxy for pollution.

Doyle's use of poisons as a shorthand for pollutants has received little critical attention, likely due to the fact that the toxic substances encountered by Holmes are organic rather than artificial, and never industrial. It is important to remember, however, that our view of organic poisons as categorically distinct from industrial emissions is a reflection of a more sophisticated understanding of pollution than that held by the late Victorians, for whom it was still a relatively novel concept. There is evidence to suggest, for example, that late Victorians saw organic poisons and industrial pollutants as capable of posing a similar kind of threat to human bodies. Moreover, epidemiologists on both

sides of the battle between miasma theory and pollution theory had begun using their preferred descriptor and "poison" interchangeably well before the fin de siècle. Famous miasmatist Thomas Southwood Smith, for example, compared the operation of strychnine and curare—two poisons that would later feature prominently in the Holmes stories—on the human body to the ravages of diseases like typhoid and cholera. On the other side of the debate, Bristol sanitarian William Budd attributed all infectious diseases to "poisons" that, he theorized, multiplied in the gastrointestinal tracts of the ill. During the 1860s, Budd suggested that these "poisons," once excreted by infected patients, wound their way into English waterways and the English atmosphere. This notion that toxic gases—whether called miasma or pollution—were in fact a species of poison gained more momentum during the fin de siècle. Alexander Wynter Blyth's 1885 manual on *Poisons: Their Effects and Detection*, for example, described diseased bodies as locations where poisons were synthesized, replicated, and then emitted into the surrounding environment (Blyth 445).

Even as Blyth attributed diseases to foreign poisons, other late-Victorian scientists traced the conceptual relationship between poisons and disease in the other direction and imagined the consumption of foreign poisons as a kind of illness. Norman Kerr's 1889 *Inebriety: Its Etiology, Pathology, Treatment and Jurisprudence* was among the first medical texts to characterize chronic intoxication as not just an immoral compulsion, but a physical disease. Defining disease as "a complex of some deleterious agency acting on the body, and of the phenomena (actual or potential) due to the operation of that agency," Kerr argued that opium was a "poison" capable of "enerva[ting] the whole man . . . inducing bodily and mental prostration and moral perversion" (8, 111). Kerr conflated

opium addiction with malaria, noting that "[t]he conditions engendering malaria are influential in fostering inebriety" not only because "[t]he depression consequent on malarial poisoning invited relief from narcotism," but also because "the malaria generating forces"—that is, the contagious toxins themselves—"operate[d] to produce inebriety" (148). Kerr went so far as to claim that, in their respective "suddenness, intensity, and periodicity, there [was]a close analogy between malarial fever and inebriate paroxysms, the same causes often originating both diseases" (148). Blyth's and Kerr's work indicate that, even as Doyle was beginning Holmes's career, late-Victorian scientists were already conflating poisons and vectors of contagion. It is hardly surprising, therefore, that Doyle should represent the detective's reliance on cocaine as a "pathological and morbid" (BLUE, Vol. 1. 214) "mania" (MISS, Vol. 2, 1124), which—much like a disease—leaves Holmes's body "dotted and scarred" (BLUE, Vol. 1, 213).

As Harris aptly points out, Doyle's representation of illness as something caused by foreign poisons can usefully be understood as "an effort at containment—an attempt to reduce disease to a concrete form on which Holmes can practice his art" (S. Harris, 448). She goes on to characterize Doyle's method as a process of othering aimed at shoring up England's colonial ambitions. The Victorian reliance on miasma theory as a justification for the imperialist project has been noted by many critics, and there is abundant evidence to suggest that Doyle was not lacking in imperialistic fervor. His 1924 autobiography suggests that his view of Africa as inherently poisonous survived the scientific repudiation of miasma theory. When remembering his 1881 voyage to West Africa, for example, Doyle documented his "death-like impression of Africa," calling it a

"great sullen brown continent" capable of killing white men with speed and ease (Memories 48).

But while Doyle's decision to represent toxins as foreign may have been partially borne of a desire to promote the imperialist project, it served a secondary purpose. By locating disease-causing agents beyond English borders and then allowing Holmes to successfully identify them and neutralize their harmful effects, Doyle imagines the threats associated with pollution as something that could—within the Holmes stories, at least—be resolved through the proper application of Holmesian logic. Rather than confront his protagonist with a phenomenon Holmes would be unable to process, Doyle adopts a technique of geographically othering urban industrial pollution. Holmes cannot accept the link between smoke and illness precisely because this equation, unlike those he routinely establishes between symbols and referents, cannot completely resolve the problem of making pollution comprehensible. As I will discuss in Chapter Three, pollution theory offered few solutions to the problem of industrial emissions. Unlike miasma, smoke could not be made to seem finite because it could not be traced to individual sources. On the other hand, a miasma-based understanding of disease made its sources localizable and offered practical solutions—like the construction of sewage conduits at home and the propagation of imperialism abroad—that the Victorians had begun to master decades earlier.

Incompatible as it was with the chaotic implications of pollution theory, Holmesian logic made necessary the geographical othering of industrial pollution in the guise of foreign poisons. It follows, therefore, that Doyle's approach to pollution would be different in those fictional universes that were not governed by the strict demands on

Holmesian logic. This proves to be the case in *The Poison Belt*, Doyle's follow-up to *The Lost World*. Unlike the latter, which Doyle sets in miasmatic foreign locales—at one point, the explorers stand "up to [their] waists in the slime and blubber of an old, semi-tropical swamp"—the action of *The Poison Belt* takes place in a thoroughly English home (*Lost World* 137). The novella begins with Professor Challenger inviting several friends to visit him in Streatham, where he owns a house at "a considerable elevation . . . on the very edge of the hill" (*Poison Belt* 187). The telegraph mysteriously instructs each of the three invitees to arrive quickly and exhorts them to "[b]ring oxygen" (177). When they arrive, Challenger explains that the Earth has entered a belt of poisonous cosmic ether which has already caused countless deaths in other parts of the world. He then seals everyone into a room "made as airtight as is practicable" through the application of "matting and varnished paper" (198). Challenger explains that the precautions are there "not to keep out the ether" but to "keep in the oxygen" (198). The Professor reasons that if he and his friends "can ensure an atmosphere hyper-oxygenated to a certain point" by simultaneously filling the room with copious amounts of oxygen, they may be able to resist the effects of the "mighty ocean of ether" surrounding the planet (175).

Much like smog in the Holmes stories, the ether is first described as behaving like miasma. Doyle begins, for example, by suggesting that the ether is a localizable problem particular to warmer climates. According to Challenger, "the less developed races [were] the first to respond to its influence" and "[t]he Northern races have as yet shown greater resisting power than the Southern" (194). He notes "deplorable accounts from Africa," lamenting that "the Australian aborigines appear to have been already exterminated," and that "India and Persia appear to be utterly wiped out" (194). In mapping the ether's

progress not only geographically but also racially, Doyle recapitulates the same chauvinist attitudes that made miasma theory so helpful to the imperialist project, and in so doing strengthens the initial analogy between the ether and miasma.

What makes *The Poison Belt* especially worthy of attention, however, is Doyle's decision to quickly recast the ether as a substance more akin to ever-expanding industrial pollutants than to geographically localizable miasma. Indeed, the story can be read as repudiating the comforting fiction of both miasma theory generally and of the geographic othering of disease in particular. While Doyle initially depicts inhabitants of southern, miasmatic climates as most immediately susceptible to the effects of the ether, he does not allow northern Europe to escape unscathed. Telegrams from Challenger's associates in France warn of "[g]reat numbers of dead in the streets" and "[c]athedrals and churches full to overflowing" (194).

The difference in the virulence of the ether seems to turn more on local elevation than global geography or proximity to miasmatic locales. Challenger reasons that, "[s]peaking generally, the dwellers upon the plains and upon the seashore seem . . . to have felt the effects more rapidly than those inland or on the heights" (194). The Professor momentarily entertains the hope that "[e]ven a little elevation makes a considerable difference," hypothesizing that "if there be a survivor of the human race, he will again be found upon the summit of some Ararat" (194). Suggesting that "[e]ven [their] little hill may presently prove to be a temporary island amid a sea of disaster," Challenger quickly dismisses the idea to ominously conclude that "at the present rate of advance a few short hours will submerge" all humans on the planet, irrespective of location (195). It is significant that Challenger's analysis, though initially couched in the

language of miasma theory, ultimately characterizes the poisonous ether as a force that cannot be localized geographically. Moreover, Challenger makes it clear that there is no hope of escaping the effects of the ether. He notes that, even at their current elevation of seven hundred feet, the group has already begun exhibiting early symptoms, and warns them that while the speed of the poisonous effects may vary depending on elevation, everyone on the planet will eventually be killed. The ether threatens the "utter extermination" of the species. Already, Challenger notes, "[t]he dead outnumber the living. It is inconceivable and horrible. Decease seems to be painless, but swift and inevitable" (194).

The universal scope and unbounded nature of the ether makes it more comparable to industrial pollution than to miasmatic gases. Doyle strengthens the analogy by suggesting that the only substance capable of successfully countering the ether is not smoke—a miasmatist's favored antiseptic—but rather untainted air. Indeed, Challenger's hypothesis that "a gas like oxygen, which increases the vitality and the resisting power of the body, would be extremely likely to delay the action" proves more correct than even he anticipates when the group is among the only humans on earth to resist the ether (197). Those who—unlike Challenger's group and an invalid asthmatic already on an oxygen regimen—are left to inhale the contaminated ether succumb first to illness and then lose consciousness entirely. "[T]he poisonous effect begins with mental excitement" and "this stimulative stage, which varies much in races and in individuals, is succeeded by a certain exaltation and mental lucidity . . . which, after an appreciable interval, turns to coma, deepening rapidly into death" (193).

But it is Doyle's characterization of the ether as a catalyst of not only physical illness but also of widespread social turmoil that is most reminiscent of late-Victorian anxieties about pollution's function as catalyst of social chaos. Challenger tells his associates of "[a]ll night delirious excitement throughout Provence," the "[t]umult of vine growers at Nimes," and even of revolutionary "[s]ocialistic upheaval at Toulon" (194). What makes the ether particularly frightening for Challenger isn't its capacity to cause "[s]udden illness attended by coma" but the "[p]aralysis of business and universal chaos" that follows in its wake (194). Challenger's concerns about the ether's impact on social structures are so strong, in fact, as to dwarf his fears about death. Dismissing the "horror with which universal death appears to inspire" his colleagues as "somewhat exaggerated," the Professor explains that he remains cheerful by likening death to a "voyage . . . made in a goodly ship, which b[ears] within it all [his] relations and . . . friends" (195). The Professor is glad that, however uncertain their ultimate destination might be, the group can share one final "common and simultaneous experience which would hold [them] to the end in the same close communion" (195). The others are quickly persuaded by Challenger's reasoning, and the group proceeds to enjoy "a very merry meal" marked by "good comradeship and gentle merriment" (196). Their exchanges during dinner are described as calm, sophisticated, and erudite. The "stupendous subjects of that memorable hour" are no less expansive than "[l]ife, death, fate, the destiny of man" and their minds are "happy and at ease" observing the contest between their host's intellectual "elemental greatness" and one guest's "subacid criticism" (196).

Superficially, Challenger's logic in finding a death surrounded by familiar faces preferable to one of "isolation [and] uncertainty" seems fairly unremarkable (195). Doyle subtly suggests, however, that what the Professor actually finds comforting is not merely companionship but the companionship of people belonging to his own social class. Challenger deliberately excludes his longtime servants from the airtight chamber, making no alternative provisions for them and neglecting to inform them about the benefits of oxygen. The Professor is wholly untroubled by the knowledge that while he and his friends delay death, his servants will lie dying immediately outside the room. Doyle implicitly links Challenger's decision to issues of class by interrupting the group's erudite conversation with an uncomfortable exchange between the Professor and his butler. When Challenger thanks the butler for his faithful service, a smile steals over the man's face, which Doyle describes as gnarled and lacking in sophistication. Challenger reacts to the butler's satisfaction by coolly informing him that he is "expecting the end of the world to-day" (196). The butler asks only when this will occur, and Challenger says that he "can't say" but that it will likely happen "[b]efore evening" (196). At that, the butler salutes and withdraws. The contrast Doyle draws between Challenger's colleagues—who accost the Professor with numerous questions about the nature and consequences of the ether almost immediately upon their arrival—and the passive butler is striking.

Unsurprisingly, Challenger echoes the views of his author by perceiving intellectual curiosity as a product of class status. The Professor pushes Doyle's relation further, however, by interpreting that curiosity as an indicator of human worth. Dismissive of his friends' natural fears about death, Challenger can sympathize only with the view that true "horror lay in the idea of surviving when all that is learned, famous,

and exalted had passed away" (195). Because loss of the intellectual upper class seems to Challenger a far more terrifying prospect than widespread loss of life, he is reassured by the notion that his sufficiently illustrious group will comprise "the absolute rear guard of the human race upon its march into the unknown" (198). It is surprising that a man so committed to logic should imbue the few inconsequential "hours, possibly even some days, on which [his group] may look out upon a blasted world" with such fetishistic value (198). This lapse in logic suggests that Challenger is afraid of the ether's capacity to effect degeneracy rather than his own death or even the extinction of the species. So long as the last humans on earth are worthy of the honor, the Professor is content.

By suggesting that the ether has a more immediate physical effect on the lower classes and warning that exposure to it incites them to revolt, Doyle echoes many of the anxieties that the late Victorians associated with industrial pollutants. As I discussed in Chapter One, coal smoke was widely perceived as threatening social instability ranging from crime to revolutionary unrest. Indeed, many Victorian commentators "saw air pollution not primarily as a public health problem but as a catalyst and cloak for social disorder" (Thorsheim 53). Doyle's decision to imbue the mysterious poison with both smoke's physical implications as a vector of contagion and with its capacity to disturb the social balance, therefore, further strengthens the parallel between the ether and industrial pollutants. But while Doyle uses poison as a proxy for smoke in *The Poison Belt* as surely here as he did in the Holmes stories, his repudiation of miasma theory in the novella suggests that his characterization of pollution depends on something other than his own understanding of pollutants. To the contrary, the dispositive difference is not Doyle's knowledge but rather the presence (or absence) of the Holmesian paradigm,

which is incompatible with pollution theory precisely because pollution, unlike miasma, poses a threat of entropic degeneracy.

Part IV: Challenging Holmesian Logic in "The Race of Orven"

A comparison between the Holmes stories and *The Poison Belt* suggests that because Holmesian logic cannot recognize a phenomenon that resists interpretation for the impenetrable clue that it is, that phenomenon must be re-characterized as something familiar within the canon. Doyle is consistent in that re-characterization: nowhere in the Holmes universe does he challenge his protagonist's treatment of local industrial pollutants as foreign poisons. Indeed, Holmes never faces a foe that ultimately cannot be categorized through the application of Holmesian logic. For an example of Holmesian logic under the stress of an unexplainable and ultimately unnarratable phenomenon that is acknowledged as such, we must therefore turn elsewhere.

Eight years after Doyle introduced audiences to Holmes, Shiel explored the limits of Holmesian logic in "The Race of Orven." A devotee of Holmesian logic, Shiel's protagonist Prince Zaleski is in many ways an echo of Holmes. Another effete and drug-addicted investigator, Zaleski systematically deciphers and coordinates the raw anecdotal material supplied by the story's narrator, who in turn functions as Shiel's intra-textual double. Like Holmes, Zaleski dazzles the narrator by constructing one seemingly uncontestable storyline from an array of arbitrary details by seeking to definitively associate each given clue with the discrete narrative link it represents. But where Holmes neutralizes the threat of pollutants by re-characterizing them as miasmatic foreign poisons, Shiel's protagonist is preoccupied by the threat of mental rather than environmental or even physical degeneration.

For Zaleski, the clue resisting interpretation is not smog but madness. Predicated as it is upon this assertion of stable relationships between objects and their referents, Zaleski's narrative abruptly ends when it encounters, in the Orvens' insanity, a phenomenon that it cannot adequately explain. Like pollution in the Holmes canon, madness in "The Race of Orven" becomes an unnarratable blank spot that cannot be reduced to a single meaning. But where Doyle has Holmes misread pollution by infusing it with incorrect and outdated notions about miasma, Shiel suddenly concludes his story. In so doing, Shiel concedes what Doyle never admits: that Holmesian logic is merely artifice and that its appeal rests not in its success as an actual investigative technique but rather in its ability to create the illusion of a reassuringly ordered world that fulfills the late-Victorian longing for order in the face of anxieties about entropic degeneracy.

Like Holmes and Challenger, Zaleski is "a consummate *cognoscente*" (Shiel 4). He is described as a "savant and a thinker" who, having "renounced the world" and exiled himself "from the rest of men," now deciphers the mysteries that others bring to his door through the application of Holmesian logic (1-4). The narrator, who serves as a stand in for Shiel, visits Zaleski's chateau for this very purpose. After an evening of the drugged, "somnolent," and "half-mystic talk" for which the Prince is equally well-known, the intra-textual Shiel takes up the subject of the late Lord Pharanx (Shiel 5-6). Having brought "a bundle of old newspapers" full of clues, he proceeds to describe the details of the most recent Orven tragedy before Zaleski, who periodically urges him to include "all the facts" available (6, 9). Willing to regurgitate factual information previously reported to the press, the narrator is unable to interpret the baffling events for himself. When, betraying his curiosity by "starting upright for a moment," the Prince demands why the

Viscount should wish to teach "agricultural labourers . . . mechanics," his visitor immediately dismisses the point as "unimportant" (12). Incapable of drawing even the most basic of inferences, he claims that "there really is no accounting for the vagaries of such a man" as Randolph (12).

More than their potential accuracy, this lack of desire to formulate opinions about "points that puzzle" him marks the narrator as being of a different species of storyteller than Zaleski, who is quite ready to methodically assign meaning to each baffling clue (27). Where the former traffics in disconnected fragments, the Prince makes those details "translucent" by reducing each to its one possible connotation (27). Framing a "clean *coup d'oeil* of the whole regiment of facts, their causes, and their consequences" (27), Zaleski positively deduces, for example, that the Atwood's machine indicates the existence of an elaborate suicide plan and that the mysterious "marks of feet in the snow" prove that "preparation was made beforehand for obscuring the cause of the earl's death" (49). Though he neither saw the actual object nor participated in the orchestration of the scheme, the Prince asserts that the "round white object" noted by Hester can occupy only one locus of meaning in his narrative (46). A symbol, it denotes the murder weapon and only that, an interpretation that entirely dismisses the housekeeper's alternate imaginative reading of that same image.

Assigning meaning to each successive piece of the "puzzle," Zaleski proceeds to organize the mess of clues into a uniform account, efficiently producing a seeming "coherence" and "symmetry" out of his guest's confusion (27, 33). The plot of the affair having been determined to his satisfaction, Zaleski takes pains to put it to a new purpose, using the fruits of his narrative to vouch for Maude Cibras's innocence. Certain that the

Home Secretary "will hardly be silly enough to suppose [him] capable of using words without meaning," Zaleski tells him "on no account to let Cibras die" on the following day (58). Significantly, Shiel leaves this exchange vague as to the precise nature of the letter, making it impossible to determine whether the Prince's message offers the whole of his narrative or merely the one conclusion touching the defendant's guilt. Though he is sure that "it will be perfectly easy to prove [his] conclusions" should the need arise, Zaleski seems less interested in establishing Randolph's complicity than he is in vindicating Madame Cibras, a noble end that is nonetheless immaterial to the resolution of the tale's actual crisis (59).

Indeed, Cibras's involvement is only incidental to what is at its core a narrative as much about hereditary insanity as it is about the decoding of an enigma. Lord Pharanx, Zaleski concludes, passed the "sentence of death . . . on himself" in accordance with "the tradition" of a family wreaked by periodic bouts of madness (57). Finding "that the dire heritage of his race" was closing in upon him, he summoned Randolph home from India so that the young man might help him respect "the secret vow of self-destruction handed down through ages from father to son" (57). Careful not to imply anything like a "general paralysis of the insane" in the facts his intra-textual alter-ego originally presents to Zaleski, Shiel underscores the seeming irrationality of so totalizing and surprising a resolution (56). Ultimately, the mystery of the earl's death has more to do with the Prince's access to privileged information than it does with his reasoning skills. As Zaleski proceeds to expound the intricacies of the plot, the narrator admits to "stirrings of the most genuine wonder," shocked that his friend could possess so intimate a knowledge of the great families of Europe (54). It is, Shiel suggests, as if the Prince "had spent a part of

his life in making special study of the history of the Orvens," a luxury not afforded to his readers (54). This is Shiel's first suggestion that Zaleski's method is little more than artifice. While Holmesian logic is sufficient to prove Cibras's innocence, the presence of the true mystery at the heart of the tale cannot be discovered through Holmesian means. To the contrary, the existence of the Orvens' hereditary condition is communicated as new information rather than as Zaleski's Holmesian illumination of preexisting clues.

Significantly, it is at this precise junction that Zaleski's own methodology fails completely. Madness, Shiel suggests, cannot be interrogated or explained through Holmesian means, and while the incidence of hereditary madness may be predicted, the contours of its expression in affected individuals are obscure. An impenetrable and therefore unnarratable symbol, the madness of the Orven patriarchs cannot be reduced to any one fixed meaning. Evocative of degeneration as surely as it is of disordered and multivalent production, the "paralysis of the insane" is especially paralytic to the progression of Zaleski's tale (56). If, as the Prince demonstrates, the structure of narrative depends on the logical and systematic association of successive clues with their discrete and knowable meanings, then the very specter of so irrational a malady marks the limitations of that process. It is hardly surprising, therefore, that the story should end so quickly after the disclosure of the Orvens' madness, with both Zaleski and his guest declining to "comment . . . further" about the matter (59). Predicated as it is on the assumption that each clue can in fact be aligned with a single meaning, the Prince's Holmesian method buckles under the weight of an unstable symbol.

Exposing his protagonist's strategy as unsustainable, unsound, and potentially irreproducible by anyone not privy to Zaleski's unique knowledge, Shiel suggests that it

has in fact been little more than a convenient fiction, necessary to mediate the exchange between Zaleski and his audience. The indefinable clue around which the Prince's story revolves, the fate of the Orven bloodline places his seemingly rational narrative in conversation with end-of-the-century anxieties about degeneration. Localized in an aging aristocratic body, this impenetrable meaning can be approached but never fully articulated, a tension Zaleski acknowledges by choosing to end his tale so abruptly. Integral for the construction of the Prince's narrative, the myth of Holmesian clue specificity and the suspension of disbelief it necessitates imply rational predictability where ultimately none exists.

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In different but analogous ways, Doyle and Shiel both demonstrate that Holmesian logic ultimately breaks down when forced to explain a phenomenon that resists a neat Holmesian interpretation. Doyle resolves the problem by privileging the integrity of Holmesian logic over scientific accuracy, choosing to mischaracterize literal pollution as miasmatic poison so as to recast it as a clue that can be first understood and then neutralized by Holmes's investigatory acumen. While the pollution discussed by Shiel is only metaphoric, his choice to conclude his tale rather that try to fully articulate the mystery of the Orvens' madness likewise demonstrates the limits of Holmesian logic. More importantly, Shiel's decision to end "The Race of Orven" so abruptly also suggests that Doyle was not alone in recognizing that a multivalent clue like pollution—whether literal or metaphoric—was incompatible with the demands of Holmesian logic.

Because it propagated the comforting fiction that every clue had one comprehensible meaning, Holmesian logic satisfied a longing for order in the face of

anxieties about entropic degeneracy. Doyle's and Shiel's treatments of environmental and mental degeneracy demonstrate that, however popular it may have been among late-Victorian audiences, Holmesian logic was unable to satisfactorily explicate the clue of pollution in fiction. Pollution proved to be equally difficult to address legally, where attempts to establish the necessary ratio between legal cause and effect failed as surely as had efforts to posit a Holmesian ratio between the clue of pollution and its meaning. In Chapter Three, I will suggest that the same anxieties about entropic degeneracy that prompted the redefinition of smoke from a localizable inconvenience to a chaotic pollutant are what ultimately sabotaged legal efforts to resolve the problem of airborne pollution during the fin de siècle. Finally, in Chapter Four, I will analyze what I see as Bram Stoker's radical decision to harness these anxieties and make them an instrument of meaning-making in *Dracula*.

CHAPTER THREE
Framing a Narrative of Containment Through Environmental Nuisance Law

Popular antipathy toward factories during the fin de siècle has long since been understood as a manifestation of anxieties about the conspicuous effects—dirt, grime, and smog—of rapid industrialization. In Chapter One, I suggested that the fear of entropic degeneracy occasioned by these rapid changes was not only a pressing cultural motive, but was in fact central to that period's gradual redefinition of smoke from a containable inconvenience to an ever-expanding pollutant. In Chapter Two, I explored depictions of pollution in late-Victorian detective fiction, arguing that the popularity of Holmesian logic could be understood as a longing for stability in the face of entropic degeneracy.

In this chapter, I will explore how Victorian legislators addressed the problem of airborne pollution, and seek to answer why the laws written by those legislators so clearly missed the mark. An adequate appreciation of the emotional underpinnings of the conceptual shift from waste to pollution has thus far been absent from studies of nineteenth-century smoke abatement and can explain both the Victorians' futile adherence to tort law as a vehicle for smoke abatement and the odd discrepancy between their approaches to liability allocation in the context of workmen's compensation on the one hand, and air pollution nuisance on the other.

In Part I, I will broadly explore Victorian methods for legally containing the threat of pollution by interrogating the tension between environmental regulation and the tort of nuisance. In Part II, I will focus on why, although they were willing to explore a contributory insurance scheme as an alternative to employers' liability in tort, Victorian

legislators curiously failed to even consider insurance as a mechanism for allocating responsibility for industrial air pollution. I will conclude by arguing that, when viewed in light of prevalent late nineteenth-century anxieties, this economically-inexplicable variance is best characterized as a consequence of the difference between familiar concerns about containable, localizable harm and the new dread of entropic degeneracy.

Part I: Understanding Late-Victorian Attempts to Regulate Pollution as Limited by Anxiety about Entropic Degeneracy

Legal efforts to contain pollution during the nineteenth century are best understood as attempts to construct a dominant cultural narrative meant to reassuringly diffuse the specter of entropic degeneracy. It would be difficult to fully appreciate the significance of that nineteenth-century narrative without comparing it to earlier legal efforts to address waste. It isn't that the Victorian approach was a departure from the norm. Indeed, law's treatment of what it perceived as refuse had always been oriented toward its containment, transport, and removal. (While the willingness to initially embrace smog as a disinfectant may seem to violate this trend, it must be remembered that airborne emissions were not perceived as refuse until the fin de siècle, and were treated differently from sewage and other material waste for only that reason.) Late nineteenth-century pollution law was, however, different from the laws regulating waste which preceded it because it persistently clung to the familiar rhetoric of containment even as the inadequacy of that approach became obvious. Victorian laws purportedly tailored to deal with smog are particularly telling, therefore, insofar as they demonstrate that the need for a containment narrative was independent of the need for actual pollution abatement. Indeed, the survival of that narrative was not contingent on the actual

resolution of the problem it was nominally meant to address. To the contrary, the proliferation of the narrative of containment was a response more to anxiety about entropic degeneracy than to anxiety about pollution itself.

Pre-Victorian environmental law, such as it was, dealt primarily with solid and liquid waste. Though there are records of sporadic complaints about smoke as early as the 1220s, they were infrequent and resulted in little state action. The two royal commissions appointed to investigate concerns about gaseous emissions during the 1280s failed to arrive at any conclusions, and were rendered moot as people became increasingly accustomed to the presence of smoke (Thorsheim 5). In 1661, John Evelyn's scathing indictment of coal smoke in *Fumifugatum* delivered the first public call for government intervention in smoke abatement, but was largely dismissed by a society that had already embraced miasma theory (Evelyn 5).

English law was somewhat more vocal, however, when sheer necessity forced it to address the public health issues associated with tangible waste. The earliest of what could charitably be called environmental regulations was a fourteenth-century order to the royal court mandating that an underground conduit be constructed to remove wastes from the royal kitchens and deposit them into the Thames. Two centuries later, Henry VIII expanded on this idea by decreeing each London homeowner responsible for the structural maintenance of that portion of the common sewer that adjoined his property (Gayman 1). While a Commission of Sewers was nominally established to enforce the decree, a provision for its funding was not made until 1622, when it was decided that the commission could collect non-compliance fees in order to finance its operations (Gayman 1). That year, Parliament finally enacted Henry VIII's Oath for Commissioners of

Sewers, which broadly provided that sewer commissioners would "consent and endeavor . . . to the best of [their] knowledge and power, to the making of such wholesome, just, equal and indifferent laws or ordinances . . . for the due redress, reformation and amendment of all and every such things as are contained and specified in [the] Commission" (*Laws of Sewers* 10-11). The few laws and ordinances that followed were primarily local, and dealt exclusively with the containment rather than the generation of refuse. Henry VIII's decree remained the only one to specifically address the issue of maintenance, and even then it was the maintenance of the conduit for the transportation of refuse rather than any environmental upkeep that was at issue. This legal emphasis on removal, when coupled with a lack of comparable controls on the nature or quantity of refuse that could be deposited in the common sewer, evidenced a belief that the problems of waste could be resolved by keeping it out of sight.

As miasma theory became increasingly entrenched in the English imagination during the subsequent two centuries, the legal narrative of containment gained further momentum. Sporadic calls for reform during this time were consistently based on the notion that waste could be controlled through sheer will and ingenuity. While the physical enclosure and removal of waste was certainly the most obvious and commonly utilized solution, containment was also achieved through more elaborate, environmentally-friendly methods. In 1588, for example, Elizabeth I granted special privileges for the collection of waste rags that could then be used in the manufacture of paper (Wagner 346). While the increased availability of cheaper goods during the industrial revolution inevitably led to the creation of more trash, it also prompted the emergence of several occupations centered around the reclamation of garbage. During the

early nineteenth century, toshers scavenged through the sewers to find objects for resale, while mud-larks did the same on the riverbanks. Dustmen, meanwhile, collected coal-fire ash, which would then be sifted into finer particles for use in soil conditioner and masonry (Johnson 1-5). Like the transportation of human waste beyond the cities, these practices reaffirmed the popular belief that refuse could be controlled and contained through simple human interventions.

Even advances in scientific understanding did not alter that narrative. To the contrary, the legal reliance on the myth of containment persisted even as pollution gradually replaced miasma as the Victorians' environmental villain. Moreover, the conceptual shift from miasma to pollution was hardly the only reason to question the narrative of containment. John Parham has argued that, while the term "ecosystem theory" did not emerge until the 1930s, that paradigm was already at work in the English imagination during the late nineteenth century (157). Parham's claim is hardly controversial; after all, the assertion that "species receive energy in exchange with other species or abiotic sources," which would later serve as the foundation of ecosystem theory, had already been accepted by the Victorians as the first law of thermodynamics (Parham 157). Indeed, "thermodynamics were transforming Victorian perceptions" and the writers of the period were incorporating into their work the same scientific ideas that would eventually shape the modern understanding of closed ecosystems (Myers 308-09).

A containment narrative premised on the view that the physical transportation of waste beyond one's immediate surroundings would render it innocuous was clearly at odds with the emphasis that ecosystem theory placed on interrelationships. The myth of successful containment was also fundamentally incompatible with the theoretical bases of

other emerging disciplines, like geology or evolutionary biology, which also implied the existence of a universe tending toward expanding degeneracy rather than static order. The Victorian reliance on that narrative, however, persisted despite its incompatibility with scientific progress, and its unlikely resilience should be understood as a reaction to the fin de siècle's anxiety about entropic degeneracy. When scrutinized in this light, legal efforts to address pollution during the period can broadly be characterized as attempts to reproduce the familiar narrative of containment, both proscriptively and aspirationally, rather than as strategies for effective smoke abatement.

Indeed, efforts to address pollution during the latter half of the nineteenth century were similar to those pursued during the age of miasma. While pre-Victorian environmental law focused on solid and liquid waste, the Victorians turned their attention to airborne emissions. Because smoke was still believed to have numerous beneficial qualities, there were no national laws regulating its emission until the 1860s (Thorsheim 112). The early Victorians felt little need to set broad limits on the production of a substance that the accepted wisdom of the day extolled as a disinfectant. Even dedicated smoke enthusiasts, however, could not deny that the supposed remedy for miasma was perceptibly inconvenient. Abundant levels of smoke in urban atmospheres began affecting the daily lives of city dwellers, and the problem was especially pronounced in London. Keeping clothes free of soot became a considerable chore, and London's refurbishing industry boomed. Those who tried to avoid grime by staying indoors fared no better. As Brimblecombe speculates, "[t]he dark-coloured wallpapers found in Victorian homes may . . . attest to the difficulty of keeping interiors clean in smoky atmospheres" (64). Pollutants had an equally corrosive effect on building exteriors. It

wasn't uncommon, for example, for the urban leases of the period to include clauses ensuring that building exteriors were repainted at least once every three years so as to minimize the appearance of smoke stains. While controlling the quantity of emissions "would seem to us to be the best response to the problems . . . the cures applied" by Londoners, while only superficial, were nonetheless thoroughly consistent with the narrative of containment (Brimblecombe 63). Wealthy urban residents were advised to avoid the soot by traveling in covered sedan chairs, and philanthropist Jonah Hanway famously carried a dark umbrella for the same purpose (Brimblecombe 63-64).

While the law provided other, equally ineffective solutions, they too were premised on the belief that airborne pollutants could be contained. During the first half of the nineteenth century, common law offered the only legal avenue for individuals who had been aggrieved by airborne pollutants. But while parties could technically sue in common law under theories of nuisance, the availability of that remedy had no noticeable impact on smoke levels because the doctrine's relationship with industrialization was still in its infancy. Until the decline of miasma theory during the late 1800s freed Victorians of the misconception that smoke was a useful disinfectant, nuisance actions rooted in the ill health effects of smoke would necessarily have been rejected for want of proof of injury. Nuisance actions claiming property damages from coal smoke, however, would have faced no such impediment. Nonetheless, very few such claims were raised during the first few decades of the nineteenth century, a phenomenon largely attributable to nuisance law's theoretical reliance on the narrative of containment.[1]

[1] For sake of brevity, I use "nuisance law" and "nuisance doctrine" broadly to encompass theories of nuisance in both common law and equity.

While the tort of private nuisance—a civil action to redress the harm caused by a defendant's interference with a claimant's use or enjoyment of his land—emerged during the reign of Henry III, it was originally narrowly defined as an infringement on easements, and the reasonableness of the interference in question was frequently a successful defense. By the 1600s, the doctrinal landscape had changed: the tort of nuisance was expanded to include protection of a claimant's enjoyment of his land, and reasonableness was increasingly rejected as an excuse for offensive conduct (Brenner 405). One of the earliest cases in this vein was that of William Aldred, who brought an action at the Norfolk Assizes against his neighbor (Aldred's). Thomas Benton had built a pig sty next to Aldred's house, and the latter bitterly complained about the resultant odors (Aldred's). When Benton responded that "the building of the house for hogs was necessary for the sustenance of man: and one ought not to have so delicate a nose, that he cannot bear the smell of hogs," the argument was rejected, and Aldred received his judgment (Aldred's). Explaining the court's reasoning, Chief Justice Wray pointed out that Aldred's claim would not have succeeded had he claimed that Benton was merely ruining his view, because while "prospect . . . is a matter only of delight, and not of necessity," light and clean air are required for wholesome habitation (Aldred's). It is important to note that the clean air discussed by the court was imagined as being free of particularly offensive odors, rather than the smoke emissions which would, at that point, have still been considered wholesome.

The rejection of reasonableness as a defense seen in Aldred's case became a recurring theme in nuisance cases. In 1628, for example, Chief Justice Hide told a defendant brewer that "it was no answer to a nuisance action that beer was necessary" if

"his works gave off offensive smells too close to the plaintiff's house" (qtd. in Brenner 405). As Joel Franklin Brenner points out, "while reasonableness [was] not irrelevant in nuisance, its relevance [was] primarily to the gravity of the plaintiff's alleged injury in light of predominant standards of comfort rather than to the characterization of the defendant's activity" (405). This balancing test was as frequently invoked when theories of nuisance were applied to address the problem of household waste rather than commercial odors. A famous 1705 case, for instance, began when the wall separating one neighbor's privy from another's house began to crumble. While the issue of sewage seepage between adjacent plots was a common one during the period, the defendant was chastised for exceeding the bounds of the tolerable because he refused to mitigate the problem by repairing the wall. Deciding against the defendant, Lord Holt concluded that, "as every man is bound to look to his cattle, as to keep them out of his neighbour's ground; so he must keep in the filth of his house of office, that it may not flow in upon and damnify his neighbour" (qtd. in Brenner 405).

Doctrinally, the tort of nuisance contributed to the production of the narrative of containment. Nuisance is at its core the law of competing land use: by insisting that necessary but proximally distasteful trades like soap-boiling, brewing, brick-burning, or tanning "could be closed down and forced to move elsewhere if they were nuisances to the neighborhood, the courts were saying in effect that certain land uses were to be preferred over others" (Brenner 405). In the 1683 matter of *R. v. Jordan*, for example, the court closed a brewery on Ludgate Hill and instructed that it be put "to another use; for that such trades ought not to be in the principal parts of the city, but in the outskirts" (Jordan). The use of nuisance law as a zoning mechanism was also emphasized by

Blackstone, who noted that an individual may be enjoined for an otherwise lawful act because "it is incumbent on him to find some other place to do that act, where it will be less offensive" (Blackstone 217-18). Premised as it was on the notion that society could be sheltered from the objectionable side-effects of otherwise desirable economic activities, this conception of nuisance law both helped produce the narrative of containment and further bolstered miasma theory.

Insofar as they dealt with waste or commercial emissions, nuisance actions were limited to organic sewage and its attendant odors and did not address coal smoke. The lack of complaints about coal smoke can be attributed to conceptual, procedural, and institutional causes. First, smoke was not conceived of as a localizable phenomenon; where one could easily isolate the nearby tannery as the root of seeping sewage or even foul smells, smoke proved more elusive. Furthermore, while the relocation of the tannery would solve the problem, the sheer number of domestic and industrial chimneys in most urban centers made physical containment impossible. Though it is unclear precisely how many domestic chimneys were operating in England during the early nineteenth century, there were sporadic, if unscientific, attempts to assess industrial impact. When the 1819 Select Committee on steam engines and furnaces attempted to gather local accounts describing the amount of industrial coal consumption in the major cities, for example, committee members were told "that the nuisances caused by factory smoke were 'daily increasing' in Britain's manufacturing centres, with Birmingham and Manchester already thought to be smokier than London" (qtd. in Mosley 14). During the 1840s, Robert Angus Smith began to monitor levels of industrial emissions in Manchester, but his "generalized experiments did not constitute the type of rigorous investigation that could

conclusively prove a link between a defendant's industrial operations and the damage caused to a plaintiff's property" (Mosley 135). In 1843, John Molesworth conducted a similar survey on behalf of the Committee on Smoke Prevention, concluding that, in Manchester alone, there were "nearly 500 chimneys discharging masses of the densest smoke" (1843 Report). He went on to point out that "the nuisance [had] risen to an intolerable pitch, and [was] annually increasing" (1843 Report). Meanwhile, as chimneys simultaneously multiplied and reached ever higher, establishing cause and effect became even more challenging. In cities like Birmingham, London, or Manchester, each teeming with chimneys constantly belching sulphurous smoke into the atmosphere, identifying the guilty party was a difficult proposition and estimating precisely how much damage a particular business had caused—as the law required—was even more challenging. Because the ubiquitous nature of smoke made its source difficult to identify, potential plaintiffs were often unable to trace their own property damage to particular causes, and consequently failed to seek a legal remedy.

Secondly, in addition to these conceptual factors, nuisance actions brought during the early 1800s rarely touched upon the issue of coal smoke because of procedural limitations. In theory, the legal avenue best suited to the needs of a plaintiff whose property had been damaged by smoke would have been the Court of Chancery, where an injunction in equity would have been available.[2] The vast majority of relevant plaintiffs,

[2] The Court of Chancery emerged around 1390 as an alternative to common law adjudication, which had grown so procedurally cumbersome as to make it prohibitive for many plaintiffs. Those who pursued cases in Chancery could avail themselves of a comparatively straightforward adjudicatory process and an inquisitorial fact-finding system which made that avenue particularly well suited to handle complex litigation. Moreover, while common law courts offered only pecuniary damages, plaintiffs suing in Chancery were free to seek equitable remedies like injunctions and specific performance. But while it emerged as a streamlined alternative to common law courts, the Court of Chancery eventually became equally sluggish due

however, did not seek equity in the Court of Chancery but pursued solutions in common law by bringing actions on the case, which by Blackstone's time had become the exclusive functional common law remedy for nuisance-based injuries.[3] Though actions on the case lay only for pecuniary damages and did not entail the possibility of injunctions ordering that offending nuisances be abated, plaintiffs nonetheless preferred them because of the relative simplicity of the attendant process and also because it did not require that the parties be landowners. The common law approach, however, was not without its attendant problems. The cost of common law process was prohibitive for those city residents who, lacking sufficient means to relocate to country estates, were most likely to bear the brunt of urban coal smoke (Mosley 135-36). Because it was not at all unusual for a plaintiff's legal fees to escalate prodigiously, concerns about expense dissuaded many potential complainants from pursuing their claims (Mosley 135). Those few plaintiffs who did seek damages in common law were awarded relatively little because prevalent jurisprudence embraced the view that urbanites "implicitly bargained away a pollution-free environment in return for the benefits of life in modern cities" (Rosen 320).

Those plaintiffs who were not satisfied with the extent of their common law judgments, however, could have lodged their complaints in the Court of Chancery.

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to the corruption of its chancellors. Much like *Jarndyce v. Jarndyce*, cases brought in Chancery during the nineteenth century were drawn out and expensive, with clerks often refusing to take any action until they were adequately bribed.

[3] Actions on the case were those brought under the writ of Trespass on the Case, which emerged during the 1370s to allow complaints for non-forcible trespass actions. Between the thirteenth and nineteenth centuries, trespass on the case became the "ultimate writ," gradually expanding to consume all of English private law (Langbein 104). The only alternatives to actions on the case, namely the assize of nuisance and the action *quod permittat posternere*, while not formally abolished until 1833, had become relics long before then.

Indeed, the adjudication of nuisance actions in equity was intended to serve as a supplement to rather than a replacement of a common law judgment. During the Lord Chancellorships of both Thurlow and Eldon, it was made clear that "interim injunctions were not to be had before the question whether there was a nuisance had been settled by a jury in a common law trial" (Cornish and Clark 155). Excepting actions arising from the obstruction of light, however, few nuisance cases pursued abatement in the Court of Chancery directly or even after securing a favorable common law judgment (Brenner 406). Potential plaintiffs quickly realized that a legal system which rarely granted effective damage awards against industrial defendants under the common law would be equally unwilling to order a factory to abate, and were understandably discouraged from pursuing the expensive and cumbersome process of Chancery.

As John Langbein notes in his *History of the Common Law*, "[t]he irony of the later history of Chancery is that a court that had come into existence and become indispensible to the functioning of the legal system on account of its superior procedures and remedies became, by the early nineteenth century, synonymous with procedural dysfunction" (362). The same procedural flaws that would inspire Dickens to satirize the Court of Chancery in the opening pages of *Bleak House* were already discouraging plaintiffs from pursuing equity remedies fifty years before the novel's publication. This procedural preference of common law over the more appropriate remedy of equity, when coupled with the near impossibility of linking one's property damage from coal smoke to any one chimney, left early nineteenth-century nuisance law effectively silent on the subject of airborne pollutants.

The third and final reason for the surprising dearth of coal-smoke nuisance actions during the first decades of the 1800s was the pronounced institutional bias in favor of those few industrial defendants who were taken to court. Rather than fine the industrial behemoths responsible for the majority of airborne emissions, courts focused their already limited attention on domestic polluters (Brenner 408). The law, which was largely oriented toward facilitating industrialization in the name of progress, treated factories more favorably than private individuals (Brenner 408). As conditions in England's manufacturing centers declined, judges faced the difficult task of reconciling the contradictory goals of improving environmental conditions on the one hand and fostering business growth on the other. By the early nineteenth century, a rigid judicial construction of liability disappeared in industrial areas as increased reliance on the doctrines of prior appropriation of land and social-cost balancing eroded the legal safeguards that had previously been available to plaintiffs. The principle of prior appropriation prevented plaintiffs from recovering for property damage if the offending factory had been established in the area for many years, while those judges who subscribed to the doctrine of social-cost balancing weighed the economic costs inherent in imposing an injunction or substantial fine on factory owners against the benefits of smoke-abatement (Rosen 303). Many Victorian judges made their bias explicit, publicly stating that life in urban centers, and particularly in factory towns, called for more forbearance than life in the country (Brenner 414). Their attitude about industrial emissions transcended party lines; the victory of Manchester's Liberals over its Tories in 1838, for example, did not affect the rate of smoke nuisance suits (Mosley 137). No matter who controlled them, the common law courts "became ineffectual because the

new industrial society had made a pragmatic trade off: dirty air in return for economic success, jobs, and consumer goods" (Mosley 135).

Because of these conceptual, procedural, and institutional causes, the early nineteenth century saw very few nuisance cases. Even as the number of chimneys multiplied, the number of common law nuisance actions prompted by coal smoke remained constant (Mosley 135). Between 1770 and 1860, for example, there were on average only two such actions per decade (Mosley 135). Injunctions and abatement orders were equally rare (Brenner 407). The broad rule guiding the infrequent treatment of nuisance cases in the Court of Chancery directed its judges "not [to] intervene by way of mandatory injunction, except in cases in which extreme, or at all events, very serious damage will arise from its interference being withheld" (Brenner 407). Nuisances so severe as to simultaneously satisfy the standard and demonstrate a discernable cause and effect relationship were infrequent, and typically concerned non-airborne emissions (Brenner 407). In the case of *Lingwood v. Stowmarket Co.*, for example, the Chancery Court famously granted equitable relief against an industrial manufacturer not only because the emissions were especially noticeable and its source easy to isolate but also because the wastes at issue had been dumped into the city's water supply (Lingwood).

While those early nineteenth-century nuisance cases that were prompted by airborne emissions concerned primarily property damage, the understanding of actionable harm evolved as the century progressed. Like the shift from a miasma to a pollution-based theory of waste that prompted it, this evolution in nuisance law was only gradual. Though many Victorians would extol the disinfectant properties of smoke until the shift from miasma theory to bacterial explanations of disease during the 1880s removed that

convenient justification, they nonetheless found it increasingly difficult to deny that, net positive or no, smoke was as detrimental to physical comfort (although not necessarily health) as to property. Coal smoke had, of course, always been a palpable source of discomfort, but the irritation it caused was characterized as something to be tolerated rather than compensated. In 1777, for example, medical writer A. Walker went so far as to claim that "lungs can actually be so accustomed" to the intensity of smoke in large cities that they are "offended" by its absence in the country, going on to distinguish between industrial emissions and the more dangerous vapors emitted by putrefying matter (qtd. in Brimblecombe 74-75). Early nineteenth-century commentators also focused on smoke's inconvenience; in his *Walks in South Lancashire and on its Borders*, Samuel Bamford characterized industrial emissions as "annoying" rather than hazardous (Bamford 10).

Until the second half of the nineteenth century, however, that annoyance was not considered to be actionable. Awards were limited to property damages because, while the miasma theory of disease made it difficult to prove that smoke was on the whole dangerous to health, the doctrine of nuisance did not initially recognize mere discomfort as remunerable at law or abatable in equity. That changed with a series of decisions delivered during the 1850s, chief among them *Walter v. Selfe* in 1851. Initiating the action against a neighboring brick kiln, Walter alleged that the smoke it emitted interfered with his enjoyment of his property by causing him significant personal discomfort. Evaluating Walter's complaint, the court had to "strik[e] a balance between his suffering and the general standard of amenity" (Brenner 410). Ultimately enjoining the defendants' brick-burning operation, Vice-Chancellor Bruce concluded that, while a

plaintiff was not generally entitled to absolutely "untainted" air, he should be able to enjoy "air not rendered to an important degree less compatible, or at least not rendered incompatible, with the physical comfort of human existence" (Walter). Bruce went on to suggest that, in order to be actionable, a plaintiff's "inconvenience" must "be considered in fact as more than fanciful, more that one of mere delicacy or fastidiousness" (Walter). To the contrary, such discomfort must "materially interfer[e] with the ordinary comfort physically of human existence, not merely according to elegant or dainty modes and habits of living, but according to plain and sober and simple notions among the English people" (Walter).

While the case is typically cited for its introduction of the balancing test between individual discomfort and general standards of amenity, its emphasis on personal comfort is as significant. Though the jurisprudence of *Walter v. Selfe* did not make every annoyance remediable at law, courts now recognized the personal discomfort caused by coal smoke as actionable in theory, if not always in practice. It is also important to note that this subtle expansion of nuisance doctrine to include discomfort preceded the decline of miasma theory by several years. It could be argued that this evolution in the legal narrative about smoke helped make the subsequent conceptual shift about pollution easier by categorizing industrial emissions as capable of causing legally (if not yet medically) cognizable harm.

Predictably, the broader conception of nuisance-based injuries led to a marked increase in the number of such claims in both law and equity. While common law actions became more frequent, the effects were even more pronounced in Chancery (Brenner 406-07). The notion that discomfort could be perceived as an actionable harm, however,

altered more than just the quantity of nuisance actions. In fact, the character of these actions also evolved, and once again it was the social reliance on the narrative of containment rather than logic which provided both the impetus and contours for the change. It is hardly surprising that, while broadening the scope of nuisance doctrine with one hand, the generally pro-industry legal establishment would seek to narrow it with the other.

At least some motivation for the subsequent evidentiary and doctrinal contraction, however, was arguably rooted in anxiety about entropic degeneracy. While the conceptual expansion of what might constitute as harm enabled a broadening group of potential litigants to seek remedies from industrial defendants, it also stood to subtly undermine the notion that the effects of coal smoke could be contained within their visible manifestations. By monetizing a plaintiff's subjective discomfort, nuisance law suggested that the dangers of industrial emissions were not limited to the tangible objects on which their mark remained and, indeed, that they could not be predicted. Partially in order to diffuse the specter of this new threat, the mid-nineteenth century legal establishment began to require that even discomfort be evinced through visually containable and discrete proofs. Consequently, the sensory perceptions of coal smoke began to play an especially important role in nuisance cases. As Mosley points out, "prosecuting counsel usually produced numerous witnesses in a painstaking," and often unsuccessful, "attempt to reconstruct the destructive path of smoke and noxious gas emissions in court" (Mosley 135). Rolling clouds of acidic smoke were described by witnesses as not only "damag[ing] buildings . . . lay[ing] waste to great swathes of vegetation," and "irritat[ing] the eyes, skin, nose, and throat of . . . aggrieved

contemporaries" generally but, more importantly, doing so through direct, observable contact (Mosley 135). Predictably, subjective experiential conclusions varied widely depending on the agenda of the witness, with industry proponents vehemently praising the many benefits of industry and capitalism during their testimony (Mosley 136). While evidence about smoke's potential to diffuse in the atmosphere and thus injure a complainant less visibly was also available, judges rarely privileged it over the testimony of witnesses who claimed that they either saw or failed to see an individual plume of smoke actually touch the plaintiff (Mosley 136). Representatives of both sides "generally called upon leading 'scientific experts' to comment on the theoretical causes and effects of atmospheric pollution," but "their often conflicting testimony was not always fully understood by nuisance judges" and was, in some cases, discounted entirely (Mosley 136).

The evidentiary emphasis on experiential testimony about direct contact between smoke and complainant was accompanied by a significant doctrinal contraction of nuisance law that, like the insistence on visible proof, was premised on the notion that the harm caused by airborne emissions could be plausibly localized. The doctrinal contraction began with the 1858 case of *Hole v. Barlow*, in which the Court of Common Pleas held proper a jury instruction suggesting that a nuisance action would not survive if the activity in question was reasonable and conducted in a reasonable location (Hole). The dispute began when the defendant, an independent builder who planned to construct houses on a field adjoining the plaintiff's home, burned large quantities of bricks on the property (Hole). During the initial trial, Judge Byles had told the jury that "not everybody, whose enjoyment of life and property is rendered uncomfortable by the

carrying on of an offensive or noxious trade in the neighborhood" should be permitted to bring a nuisance action because allowing them to do so would leave "the neighborhood of Birmingham and Wolverhampton and the other great manufacturing towns of England . . . full" of such claimants (Hole). He went on to conclude that "no action lies for the use, the reasonable use, of a lawful trade in a convenient and proper place even though some one may suffer annoyance from its being carried on" (Hole). Approving Byles's direction for the Common Pleas, Judge Willes pointed out that the common law right to a comfortable enjoyment of the air must be qualified (Hole). "[N]ecessities," he noted, "may arise for an interference with that right pro bono publico . . . private convenience must yield to public necessity" (Hole). Willes went so far as to analogize the defendant's right to burn bricks to a sovereign's right to take land by force, describing both as "necessary" (Hole).

Since reasonableness had been rejected as a defense in Aldred's case, the decision in *Hole v. Barlow* constituted a departure from previous law. Had it remained controlling, the case would have required a successful plaintiff to "show that the defendant had acted unreasonably in doing him damage, and the liability would have come to resemble negligence, as it does in America" (Brenner 411). The English courts, however, overturned the case within four years. Like the case it supplanted, *Bamford v. Turnley* began as a neighborhood dispute about the fumes issuing from a private brick kiln. While the defendant's characterization of his activity as necessary and temporary failed to convince the court, the plaintiff successfully argued that, though a nuisance may sometimes be excused "for the sake of trade in towns, or for the public benefit," the smoke and fumes at issue were "created by the defendant for a private purpose"

(Bamford). He went on to note that "the extent of the advantage or convenience to the defendant cannot justify the creation of such a nuisance to the plaintiff" (Bamford).

Though the jurisprudence of *Bamford v. Turnley* would come to characterize English nuisance doctrine throughout the remainder of the century, it was not applied equally to all defendants. Consequently, the importance of *Hole v. Barlow*'s reversal, although admittedly significant, should not be overstated. While some judges were willing to assure "that persons did not ruin their neighbors' amenity in the name of convenience, they were not willing to extend a similar protection to persons suffering personal discomfort from industrial nuisances" (Brenner 412-13). The lack of nuisance actions filed against factories implies that the different approach vis-à-vis individual tortfeasors on the one hand and industrial tortfeasors on the other was the order of the day well before it was formally articulated in 1865 with *St. Helen's Smelting Co. v. Tipping*. The dispute itself began in 1861, when Tipping bought a 1300-acre estate in the growing industrial town of St. Helen's. Located on the Lancashire Coalfield, the town owed not only its prosperity but also its cultural identity to coal—so much so, in fact, that the original motto on the borough's coat of arms was "Ex Terra Lucem," or "From the Ground, Light." While the abundance of coal smoke in St. Helen's had led to a number of nuisance actions alleging the destruction of property over the years, Tipping sought to recover not only for injuries to property but also for the considerable personal discomfort occasioned by his estate's proximity to the defendants' copper-smelting operation (St. Helen's). Warning that the law should not remunerate "trifling inconveniences," Judge Mellor instructed the jury that, in order to be actionable, the harm caused by airborne pollutants "must be such as visibly to diminish the value of the property and the comfort

and enjoyment of it" (St. Helen's). Mellor's emphasis on the visible echoes the evidentiary requirement of directly observable proof and, in turn, the rhetoric of containment that prompted its adoption. After the jury nonetheless returned a verdict with substantial damages for Tipping, the House of Lords only partially affirmed the ruling, holding that the factory "was liable for any physical damage it caused, but not for the deterioration of the plaintiff's comfort" (St. Helen's). According to the appellate panel, "persons living in society" must submit "to that amount of discomfort which may be necessary for the legitimate and free exercise of the trade of their neighbors" (St. Helen's). That same deference, however, "would not apply to circumstances the immediate result of which is sensible injury to the value of their property" (St. Helen's). Like the trial judge before them, the House of Lords premised the legitimacy of the plaintiff's nuisance-based injury on its containability, recognizing only those discrete harms which could be perceived and localized; while property damaged qualified, discomfort did not.

St. Helen's Smelting announced the kind of compromise between private and public interests that would dominate airborne nuisance cases for the remainder of the century and, in so doing, stripped nuisance doctrine of the potential to appreciably improve air quality. Rather than fully overturn *Hole v. Barlow*, the House of Lords began the trend of applying it one-sidedly. Noting that allowing plaintiffs to "stand on extreme rights" may undermine business, Lord Wensleydale argued that the discrepancy was not only permissible but also necessary in industrial centers like Lancashire, "where great works have been created and carried on, and [were] the means of developing the national wealth" (St. Helen's). Consequently, while "[s]trict nuisance liability would apply to

John Doe down the street," a manufacturer "would be judged by a more lenient rule" (Brenner 415). The deference to industry established during the 1860s, when coupled with the increased evidentiary reliance on the narrative of containment, delayed the development of effective legal responses to coal smoke in both law and equity. Ultimately, these trends left the doctrine of nuisance unequipped to address the problem of airborne emissions during the 1880s and 1890s, when Victorians finally recognized coal smoke as an unquestionably dangerous pollutant.

Like that of nuisance law, the story of nineteenth-century smoke abatement legislation is greatly indebted to the narrative of containment. Regulations suggested by the few prescient environmentalists skeptical of the wholesome benefits of coal smoke during the first half of the century were routinely derailed by the societal reliance on the rhetoric of containment. As early as 1820, M.P. for Durham Michael Taylor, lobbied for a bill that would require the furnaces of steam engines to be reconfigured in such a way as to consume their own smoke (Brimblecombe 101). Taylor had been inspired by the work of Josiah Parkes, a Warwickshire furnace owner who modified a furnace in just this way by introducing an auxiliary air supply (Otter 85). Those parliamentarians who visited Parkes's furnace were reportedly quite impressed by the feat, and Taylor's efforts culminated with the passage of the bill early in the decade. Its effects were limited, however, because the reduction of emissions required so high a level of care in stoking the furnaces as to prove impracticable by most furnace owners, who would have to hire additional staff in order to operate the modified machinery. Consequently, many industries requested and were granted exemptions from the regulation (Brimblecombe 101).

Two decades later, M.P. for Lymington W. A. Mackinnon had even less success with his national campaign for smoke abatement. The chairman of an 1843 committee exploring the *Means and Expediency of Preventing the Nuisance of Smoke Arising from Fires or Furnaces*, Mackinnon sought to gather pertinent information from scientists, manufacturers, and engineers, going so far as to suggest that coal smoke may pose a health risk to those who inhaled it regularly. A report summarizing the committee's findings noted

> that the attention of the parties called to give evidence [had] been principally directed to the consideration of the following heads on which their opinions were given: 1. Whether it was practicable entirely to prevent, or very much diminish, the nuisance now so severely felt in large towns and populous districts from the smoke of furnaces or of steam-engines. 2. Whether, if this were practicable, it would be advisable to take any steps to prevent the nuisance, as to doing might interfere with the property of interests of manufacturers, or of proprietors of furnaces. (1845 Report)

The report went on to conclude that, "[i]n regard to the first of these questions, it appears from the whole of the evidence of scientific and practical men, including master manufacturers, that smoke which is the result of imperfect combustion, may in all cases be much diminished, if not entirely prevented" (1845 Report). Furthermore, it was the "unanimous opinion of the witnesses" that "imperfect combustion [arose] from a deficiency of air to mix with and act on the inflammable matter at a proper temperature," a problem that could be resolved by the introduction of additional air (1845 Report). According to the report, the "admission of air," if "properly regulated," was the "greatest if not the only principle of preventing smoke" (1845 Report). The solution was all the more compelling for having already been tested; Josiah Parkes, after all, had implemented the same logic two decades earlier. When the committee urged the adoption of legislation that would force furnace and factory owners to adopt similar measures,

however, their recommendations were largely dismissed by Parliament as unworkable (Brimblecombe 101). After the committee's report failed to convince government leaders to push for abatement on a national level, Mackinnon took matters into his own hands. He presented a national bill that would prohibit the smoke nuisance from manufacturers but would apply only to the smaller category of furnaces that were used to heat steam boilers (Brimblecombe 101). The bill encountered significant resistance and was ultimately rendered powerless after the introduction of several weakening amendments (Brimblecombe 101).

Mackinnon tried again two years later, but his second bill was swiftly defeated. While the third, introduced in 1846, was withdrawn, a Public Health Bill passed that same year did include a weak clause concerning smoke prevention. Encouraged by that victory, Mackinnon urged the city of London to consider similar legislation, and the first draft of its Sanitary Improvement Bill consequently included some modest language about smoke abatement. Though so limited as to be effectively nominal, the proposed smoke prevention clauses garnered criticism from both industry leaders and miasma-theory enthusiasts. Ultimately, the lack of a widespread desire for smoke abatement allowed industrialists to successfully oppose the planned legislation. Unsurprisingly, Mackinnon's fifth and sixth attempts to pass relevant legislation in 1849 and 1850 also failed due to the substantial pressure exerted by a powerful industrial lobby.

Interestingly, Mackinnon's views were met with more enthusiasm on a municipal level, and helped shape a number of local smoke-abatement provisions in the 1840s. The Leeds Improvement Act of 1842 included an anti-smoke clause, as did similar measures in Derby and Bradford. Legislators in heavily-industrialized Manchester passed the

municipal Police Act of July 1844, which contained an analogous provision that closely tracked the language of the Derby and Bradford Acts. The Manchester legislation required that factory owners utilize "the best practicable means" to prevent smoke, and provided that violators would "forfeit and pay the sum of 40 s[hillings] for and in respect of every week during which such furnace or annoyance shall be so used and continued" (Manchester Police Act). The provision went on to note that, after a month of sustained violation, offenders would be given "notice . . . by the council to remedy or discontinue same" (Manchester Police Act).

The local legislation, while ambitious, was not without its flaws. Its terms were ambiguous and failed to specify the level of emissions that would constitute an offense. As M.P. for Sheffield John Arthur Roebuck noted in 1849, there was no adequate gauge for smoke, and the absence of a viable scheme for quantifying smoke left local inspectors with no alternative but to assess smoke density visually and imperfectly. The regulations were written in such a way as to require proof "that a furnace continue[d] to smoke for a whole week, without interruption," a clause that often invalidated crucial evidence for want of "a single day, or even hour's proof" (*Patent* 109). The "best practicable means" standard also thwarted implementation. The standard was defined as neither "the best conceivable method, nor the best available method," but rather "that method which the manufacturers felt they could install at a cost they believed reasonable" (Brenner 428). As most local smoke inspectors were poorly paid and lacked the relevant engineering or scientific wherewithal, they were at worst easily corruptible and at best unequipped to adequately assess the reasonableness of factory compliance. The chief weakness of the local legislation, however, was economic. The forty-shilling (or two-pound) fine was so

trivial as to serve no actual purpose, and since the clauses required that an offender receive a month's notice in writing before any prosecution could begin, magistrates could impose no more than six fines on any factory each year. This twelve-pound maximum was, according to an 1846 national report on smoke prohibition authored by Henry Thomas De la Beche and Dr. Lyon Playfair,

> a sum so small, that a refractory smoke-maker would be willing to pay it rather than be put to the greater expense of altering his boilers or furnaces. The smallness of the fines acts prejudicially to the success of the Acts in Derby, Leeds, Manchester, &c. . . . [and] when we visited [Leeds] in the present year, the chimnies were pouring out black and opaque smoke, as if no Act prohibiting it existed. (1846 Report)

The report made it clear that the smoke-abatement clauses could do nothing to curb the spread of coal emissions if fines were kept so low as to be painlessly absorbed into a factory's operational costs.

The debate surrounding both Mackinnon's national crusade and attempts at local legislation generated significant public interest. In addition to *The Times*, *Chambers Journal* was especially prolific in informing its audience about the benefits of smoke abatement. Novels like Elizabeth Gaskell's *Mary Barton* and Charles Dickens's *Hard Times* documented the effects of the smoke nuisance on English cities and English citizens. Gaskell wrote of the "bitter black frost" engendered by the billowing smokestacks, lamenting that "[h]ouses, sky, people, and every thing looked as if a gigantic brush had washed them all over with a dark shade of Indian ink" (*Mary Barton* 46). Dickens, meanwhile, described his Coketown—an industrial town modeled on Manchester—as a blighted landscape "of machinery and tall chimneys, out of which interminable serpents of smoke trailed themselves forever and ever, and never got uncoiled" (*Hard Times* 32). Gaskell went so far as to detail the limitations of smoke

abatement legislation. In *North and South*, she had cotton mill manufacturer John Thornton explain that, while he took the initiative to modify his smokestacks "to burn [their] own smoke . . . before parliament meddled with the affair," he would not have been compelled by the new regulations themselves (78). Thornton suggests that, rather than immediately comply with the laws, he instead would have "waited to be informed against and fined," a prospect he considers unlikely because "all laws which depend for their enforcement upon informers and fines, become inert from the odiousness of the machinery" (78). Consequently, while numerous factories "constantly sen[t] out one-third of their coal in . . . unparliamentary smoke," Thornton deems it doubtful "if there has been a chimney in Milton informed against for five years past" (78).

Gaskell's observations about legislative inadequacies were apt. As the public's desire for reform grew, so did the certainty that the problem of pollution could not be redressed by legislative means. The reformers' tendency to repeat the same mistakes in drafting new anti-emissions clauses reinforced the view that pollution was uncontrollable, and would spread throughout the country unchecked. The fact that local laws failed to decrease levels of smoke in Derby, Leeds, and Bradford was already commonly known well before the analogous provision was adopted in Manchester. Indeed, "at least twelve months before the passage of the Manchester Police Act, the 'best practicable means' clause it contained was known to be just another *cul-de-sac* as far as smoke abatement was concerned" (Mosley 139). The failure of the Manchester legislation, in turn, did little to alter the course of national reformers, who repeated local mistakes with similar results.

During the 1850s, Henry John Temple, the third Viscount of Palmerston, took up Mackinnon's mantle of smoke prevention advocacy. In 1853, he had an ambitious

abatement bill introduced to the House of Commons but, like Mackinnon's early efforts, his were derailed by the inclusion of numerous weakening amendments. Perhaps the most significant, and certainly the most enduring of these additions was the introduction of the "best practical means" standard to the language of the bill. The concept has since become a permanent fixture in British (and European) environmental legislation, contributing to "the flexibility of a system which has been notoriously reluctant to fix quantitative limits to the permissible levels of pollution" (Brimblecombe 103). The effects of the added language were much the same in 1853. The subjective notion of "best practical means" ultimately eviscerated the bill, as abatement was deemed impractical when weighed against the promise of continued industrial progress.

Though largely nominal, Mackinnon's and Temple's efforts during the 1840s and 1850s did pave the way for England's first significant attempt to broadly regulate industrial emissions. Where Mackinnon and Temple had struggled to contradict popular understanding of coal smoke by characterizing it as a potential (although unproven) health hazard, the framers of the several Alkali Acts adopted between 1863 and 1881 were more successful because they focused their attention on property damage. Unlike nuisance law, which concerned itself with the harm inflicted on the homes and belongings of individuals, the Alkali regulations were a response to large-scale economic devastation. By the 1860s, vast portions of the countryside surrounding St. Helens, Newcastle, and Glasgow had grown barren and unsuitable for grazing or agricultural cultivation; as one observer noted in 1862, "[t]he farmer may sow if he pleases, but he will only reap a crop of straw" (qtd. in MacLeod 87). Recognizing the link between the failing harvests and the emission of hydrochloric acid by the alkali industry, Parliament

convened a Select Committee tasked with investigating the problem and identifying solutions that would be acceptable to industry leaders (Brimblecombe 137).

While hydrochloric acid was a byproduct of many manufacturing processes, large amounts of the acid were released into the atmosphere by the alkali industry, which produced sodium sulphate, sodium carbonate, and sodium hydroxide. Parliament's deference to the industry is hardly surprising, as alkali manufacture was particularly important to the Victorians. The first English factory to produce soda through the Leblanc process had been built in 1823. The Leblanc process involved two chemical reactions. First, sodium chloride was heated with sulfuric acid to produce sodium sulfate (salt cake). The resultant salt cake was then mixed with crushed coal and limestone and heated, yielding sodium carbonate (soda ash). The first step was particularly harmful, as it involved the venting of hydrochloric acid gas into the atmosphere.

Within forty years, the alkali trade had become one of England's most important industries, providing the sodium carbonate necessary for the manufacture of textiles, glass, and soap. In 1862 alone, the industry employed nineteen thousand men earning £871,000; not only necessary to all species of chemical manufacturing, an alkali factory was also widely perceived as an indispensable pillar of its community ("Statistics"). Thus motivated, the Select Committee began exploring relatively cheap solutions, and the one they ultimately settled upon was so simple as to satisfy even factory owners. It was determined that, when the fumes from the manufacturing process were properly washed, their acid byproducts would dissolve in water. Industrial leaders found the remedy palatable, and many had already implemented it in order to improve relations with their neighbors. Having secured industry support, the Select Committee was able to propose

legislation to Parliament in August 1862, and the first of the Alkali Acts was adopted in the following year.

The bill's rapid passage, however, should not be confused with its popularity. Many outside Parliament found the notion of the state interfering with industry both radical and repugnant (Brimblecombe 137). But while it was also sometimes argued that government meddling would undermine the promise of national prosperity, popular skepticism about the Alkali Acts should be understood as a function of the widespread dependence on the narrative of containment. It is significant that the most ardent and loquacious critics of the Acts were skeptical not because of their concerns about continued industrial progress, but because they perceived the legislation as detracting from existing, and largely ineffective, tort remedies.

The bulk of that aversion can be traced not to concerns about the substance of the Acts, but to the misconception that the new legislation would supplant nuisance actions. The first Alkali Act led to widespread concerns about the continued availability of the tort of nuisance as a remedy. During his tenure as Chief Inspector of the Alkali Inspectorate, Robert Angus Smith concluded that the very "act of inspection cause[d] people to suppose there [was] no redress" in nuisance law (1878 Report). Though common law rights were explicitly preserved in the 1874 Act, "there are indications that [even] this legislation was perceived by residents in neighbourhoods affected by pollution as immunizing regulated works from any civil liability" (Pontin 663). Not surprisingly, the 1878 *Report of the Royal Commission on Noxious Vapours* included popular complaints that the Acts "had given [alkali] manufacturers a sort of licence," making it "useless to attack them, because they could produce certificates of having complied [with

the legislation].” The framers of the Acts reacted by trying to cure popular misconceptions with facts. Ben Pontin reports that “it was the practice of at least one of the Alkali Inspectorate when faced with complaints about damage to property arising from regulated works to send out letters stressing that common law rights of action were unaffected by the legislation” (663). The fact that these efforts to “disabuse complainants of their ‘popular prejudice’ and ‘misapprehension’” met with little success is itself a testament to the strength of the Victorian reliance on nuisance law (Pontin 663).

The late-Victorian affinity for tort law is, for the purpose of this inquiry, more telling than the actual passage of the Alkali Acts. It is important to note, for example, that the reliance was conceptual rather than practical. Evidentiary restrictions and judicial favoritism toward industry had left nuisance law unable to actually address the problem of coal smoke. Having recognized that tort law was essentially powerless in this context, plaintiffs had already largely abandoned it by the mid-1860s. There was a remarkable absence of reported nuisance actions lodged against factories long before the outlier of *St. Helen’s Smelting*, which was itself ultimately decided in favor of the industrial defendant. The trend continued after the passage of the first Alkali Act, and there are no records of nuisance actions being brought against alkali manufacturers in the subsequent decade (Pontin 663). While some nuisance cases were still filed against factories, those matters principally concerned water pollutants rather than airborne emissions. Insofar as it applied to coal smoke, nuisance law had already become a largely symbolic apparatus.

Nonetheless, although it rarely led to monetary damages or injunctive relief, the doctrine of nuisance was conceptually satisfying insofar as it posited the possibility of assigning liability for what was, in the actual world, an expansive and thoroughly

unlocalizable hazard. Functionally useless, nuisance law had remained a reassuring method of conceptually containing the phenomenon of airborne emissions. The blame mechanism afforded by tort law allowed the Victorians to construct a discrete one to one ratio between the problem of industrial pollutants and its origins, even if that relationship was only figurative.

The Victorians' impractical reliance on this legal narrative of containment was not a consequence of their lack of sophistication; they knew that what they clung to was an outdated fiction. It was clear that the lack of a functional scheme of collective liability made the one-to-one assignment of responsibility random at best. The House of Lords Select Committee on Noxious Vapours had articulated the problem as early as 1862, noting that "[w]here a single manufactory is a source of annoyance, it is comparatively easy for any individual to recover damages for loss inflicted upon him; but where the injury is aggravated by many different manufacturers being carried on in the same place, there is, practically, no redress to be obtained" (1862 Report).

The Victorians' continued conceptual reliance on the doctrine of nuisance even after a better, more effective alternative emerged signals a profound emotional indebtedness to the narrative of containment. Though empirically futile, nuisance law nonetheless represented a mechanism through which individual plaintiffs could theoretically contain, whether through injunction or crippling fines, the fundamentally uncontainable phenomenon of coal smoke. The preference for nuisance law over legislation in this context suggests that the purpose of late-Victorian pollution law was to produce a narrative of containment first, and only then bridge the gap between concept and reality by actually controlling the spread of emissions. While the evidentiary and

doctrinal bias in favor of industry thwarted the Victorians from attaining this secondary goal, many remained satisfied because the first had already been met.

Part II: Contrasting Victorian Debates about Liability Allocation in the Contexts of Workmen's Compensation and Pollution

Workplace safety reform is a salient example of the Victorians' approach to hazards they did not perceive as entropically degenerative. While the emotionally-driven desire for containment limited the options considered by legislators in their discussions of pollution, other hazards were approached more broadly. An analysis of factory safety reforms, for example, illustrates the wide range of options available to resolve questions about liability when the underlying harm resulted from what was understood as a non-entropically degenerative danger. Victorian discussions about workplace safety offer a useful counterpoint to those about pollution primarily because, in both contexts, would-be reformers contemplated the regulation of the same factories. Early workplace safety legislation of the 1840s and 1850s can, in fact, be understood as a precursor to the regulation of industrial emissions that would begin a decade later with the passage of the Alkali Act of 1863. Both debates were initially "principally concerned with the imposition of prescriptive controls upon factory owners, backed by criminal sanctions, and enforced by a central inspectorate" (Pontin 673).

By the 1880s, however, the two discussions assumed very distinct features. The debate about workplace safety received broader national attention and was more sustained than discussions about the regulation of pollution (which would, in turn, garner more attention in the twentieth century), largely because hazards to employees within the factory seemed deterrable in a way that pollution did not. A critical contrast between the

two lay in the underlying policy objectives motivating the calls for reform. While damage prevention became a focal point during public conversations about factory safety, the same consideration was noticeably absent from calls for tort reform in the context of chemical pollution. The focus on workplace harm prevention was predicated not only on the assumption that individual factory owners would respond to adequate deterrence measures, but also on the belief that the dangers in question could in fact be controlled by rational, economically-motivated actors. As early as 1833, plaintiff-friendly negligence provisions were explained as endeavoring to produce behavioral changes on the level of factory design and management (1833 Report). That year, a report by the Factory Commissioners reasoned that "[i]f . . . pecuniary responsibility for accidents which are incidental to the use of machines is imposed upon [the factory owner], those consequences will be more likely to be taken into account, and to be guarded against at the time of the erection of the machinery" (1833 Report).

The assumption that factory owners could be incentivized to improve conditions for their workers persisted throughout the century. In an 1846 paper delivered before the Manchester Statistical Society, public health activist Edwin Chadwick called it "a general principle of justice and . . . a measure of prevention, that those who erect machines, or conduct large and dangerous works . . . should be primarily responsible" for the costs associated with workplace injuries (18). In 1869, Chief Inspector of Factories Alexander Redgrave likewise informed Parliament that "[t]he only way to cause employers to keep their attention fixed upon the prevention of accidents would be to give an injured person a ready and inexpensive mode by which he could obtain compensation without being compelled to go through cumbersome process of an action at law" (473-74). The views

championed by Chadwick and Redgrave were equally popular in the press. An 1880 issue of the *Railway Service Gazette*, for example, called for "a provision which would make it more to the interest of employers to avoid accidents" (qtd. in Bartrip and Burman 165). According to the *Gazette*, which argued that "the only provision which answers to this description is one which compels [employers] to make compensation to the sufferers if avoidable accidents occur," factory owners would act only if financially motivated (qtd. in Bartrip and Burman 165).

While economically-based solutions to the problem of factory safety were numerous, they can be categorized as either employee- or employer-driven. More so than discussions about pollution, the debate about workplace conditions tracked class divisions. Pontin describes it as "[a] profound contest of opinion" that opened "out into two very different approaches to defining and solving the occupational hazard problem" (676). While employees proposed an approach organized around tort liability and the regulation of factory standards, manufacturers instead suggested a mandatory contributory insurance regime. Though Victorian reforms would ultimately implement the former strategy and fail to establish the described insurance scheme, the serious consideration afforded both approaches manifests an understanding of workplace hazards as a containable—and therefore non-entropically degenerative—danger.

A method of deterrence favored by employees in the context of tort law was the gradual expansion of standing to include a wider array of plaintiffs. The rule of *Baker v. Bolton* barring recovery for purely emotional or economic losses meant that only the victim himself could recover in a tort action (Baker). Since liability attached only in those situations where the victim survived his injuries, the most egregious examples of

workplace hazards resulting from a factory owner's wrongdoing could not be deterred through the application of tort law. This changed in 1846 with the passage of the Fatal Accidents Act which, while motivated by concerns about railway rather than factory safety, had important implications in the factory context. More commonly known as Lord Campbell's Act, it safely allowed the relatives of a decedent who had died as a result of another's wrongdoing to recover monetary damages. Building on these earlier gains, the Employers' Liability Act of 1880 went further. Recognizing that common law remedies for workplace accidents were so limited as to provide only marginal deterrence, the Act extended tort liability to employers for those injuries that their workers sustained as a result of the nature of service or the negligence of managers, superintendents, or foremen. The burden of proving that the injury in question had occurred as a result of such conditions remained on the employee until the passage of the Worker's Compensation Act of 1897, which required that he only demonstrate that the injury had indeed been sustained on the job.

As the last and in many ways most influential piece of Victorian legislation on the subject, the Worker's Compensation Act warrants closer scrutiny. In their seminal analysis of the events leading to the passage of the Act, Peter Bartrip and Sandra Burman generally argue that the expansion of tort liability was not only a means of preventing injuries through deterrence, but also a reaction to class tension. Pontin echoes their analysis, suggesting that, rather than casting tort law in instrumental terms, the Act revealed the political motivations underpinning the debate about factory safety. "[T]he possession of rights" in the context of the Act was "understood to be deeply implicated with configurations of socio-economic power" (Pontin 662). This view was made explicit

by Lord Collins in the 1905 decision of *Simpson v. Ebbw Vale Steel, Iron & Coal Co*., which denied recovery to the widow of a colliery manager who had been killed in an underground accident. Noting that the Act defined a "workman" as any "person who is engaged in an employment . . . whether by way of manual labour or otherwise," Collins held that the deceased was nonetheless outside of the purview of the Act because, while non-manual labor generally qualified, the victim "must still be a workman" in order to fall within the scope of the provision (Simpson). The language of the Act, Collins argued,

> presupposes a position of dependence; it treats the class of workmen as being in a sens *inopes consilii*, and the Legislature does for them what they cannot do for themselves: it gives them a sort of State insurance, it being assumed that they are either not sufficiently intelligent or not sufficiently in funds to insure themselves. In no sense can such a principle extend to those who are earning good salaries. (Simpson)

Collins's statutory analysis is notable for its assessment of the paternalistic motivations of both the Worker's Compensation Act in particular and, by extension, of the debate from which it sprung.

Those motivations are perhaps most apparent in Victorian legislation regulating factory conditions through the introduction of workplace safety standards rather than through the deterrent aspects of tort liability. The same workers' groups that favored provisions making recovery in tort actions available to the families of injured workers also promoted stricter standards and government oversight. The resultant flurry of regulations shaped English public policy about manual labor along a decidedly paternalistic trajectory. Besides implementing provisions like the Metalliferous Mines Regulation Act or the Shop Hours Regulation Act, which restricted the labor of economically dependent women and children, Parliament also gradually extended state protection to self-sufficient adult men. The series of Factory Acts that began with the

relatively modest Factory Health and Morals Act of 1802, for example, attempted to prevent rather than deter accidents by regulating factory conditions. The 1802 provision mandated that all factory rooms be well ventilated and lime-washed at least twice each year, and required factory owners to promptly address the development of any infectious disease among their workers. While failure to comply could result in a two to five pound fine, the accompanying lack of an inspection scheme gave Parliament little practical authority (Factory Health and Morals Act of 1802). Though the omission of an enforcement regime rendered the 1802 largely impotent, its preventative rationale was revisited with increasing success throughout the century. The Factory Act of 1833 elevated reform from theory to practice by providing for the routine inspections of factories. The Factory Act of 1844 mandated that fences be constructed around machinery, and the issue was addressed by even stronger language in the Factory and Workshop Act of 1891. The 1844 Act also required that accidental deaths be reported and investigated, mandated record-keeping with respect to factory safety compliance, and increased the frequency with which owners were to lime-wash the premises to no less than once every fourteen months. While the factories in question would, of course, appear woefully unsafe to a modern visitor, the changes implemented by the Factory Acts were nonetheless a radical improvement upon earlier conditions.

Unlike the protection of women and children, which was framed as a generalized defense of social mores, the paternalism of those provisions that addressed general workplace safety was couched in the rhetoric of rights and right bearers, a dimension wholly absent from contemporaneous discussions about pollution. As the adoption of the Factory Acts of 1844 and 1891 illustrates, each worker was believed to possess the right

to a workplace that was, among other things, routinely lime-washed and organized in such a way as to keep dangerous machinery fenced away from heavily-trafficked areas. The mandate for fencing aptly manifests not only the belief that workplace dangers could be contained, but also the expectation that the state would assure their containment. Even the paternalistic implications of factory safety legislation were a function of Victorian confidence in the state's ability to substantially reduce the probability of accidents. Workplace harm was conceptually construed as something from which the weak could be guarded by the strong. Gaskell alludes to this paternalistic understanding of workplace safety in *North and South* when she has Margaret Hale suggest that industrial masters perceive their workers as "merely tall, large children . . . with a blind unreasoning kind of obedience" (115-16). Thornton likewise explains that employers consider employees to be "in the condition of children" who "require a wise despotism to govern" and protect them from all manner of ills during business hours (116).

Though manufacturers proved less effective than workers in advocating their own strategy for reform, the fact that a scheme of contributory insurance was even entertained as a possible solution is consistent with the Victorian understanding of workplace hazards as manageable. Its lack of success was partially a consequence of delayed timing, as the contributory insurance regime wasn't publicly mooted until an 1878 letter to *The Times* (Bartrip and Burman 141). The National Association for the Promotion of Social Science, however, became very interested in the idea in the two years leading up to the passage of the Employers' Liability Act of 1880, at which point the proposal garnered considerable if ultimately insufficient parliamentary support (Pontin 676n).

Timing, while a handicap, was hardly the only barrier to the success of the proposed insurance scheme. Its chief problem was that, because the pre-existing alternatives in tort law and regulatory law already treated the danger in question as non-entropically degenerative, a different strategy that would accomplish the same conceptual work was superfluous. Manufacturers who opposed the expansion of tort liability in favor of insurance took particular issue, for example, with the suggestion that it could be imposed as a consequence of factory ownership alone, even if the owner was not individually at fault. The argument was not adequately convincing in the workplace safety context precisely because the danger of factory accidents was considered satisfactorily traceable to a discrete actor, however remote he might be. The same emphasis on proportionality between fault and penalty that marked discussions about workplace safety would prove much more integral to the debate about pollution, where it led many to conclude that industrial emissions could not be managed because they were untraceable to any one factory in what were often heavily industrial areas.

However unsuccessful, the notion that insurance could serve as an alternative to employers' liability in tort was so widely discussed in the last two decades of the nineteenth century as to color understanding about even those measures that were based firmly in tort law. Lord Collins's phrasing in *Simpson v. Ebbw Vale Steel, Iron & Coal Co*., for example, characterized the Worker's Compensation Act as being akin to a kind of state-provided insurance for those who were "either not sufficiently intelligent or not sufficiently in funds to insure themselves" (Simpson). While the structure of incentives and risk-bearing that underpins insurance regimes is admittedly somewhat different from that contemplated by tort law or factory safety regulation, all three solutions are

predicated on the belief that workplace dangers can be either physically contained through measures like fencing or made economically bearable through the cost-shifting calculus of contributory insurance.

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Pollution, however, was treated much differently from workplace hazards. Because the aggregation of factories in urban centers raised the problem of collective liability, an insurance scheme would have been particularly well-suited to addressing the problem. But insurance was never considered as an alternative to tort law in the pollution context and the ultimate failure of both tort law and of the few arbitrarily pursued practical efforts to control smoke only fortified the emotionally-driven view that it was, in fact, uncontrollable.

This adherence to tort law is curious not only because the pro-industry doctrines employed by judges had left that remedy essentially powerless, but because urban inhabitants had consequently already abandoned it. Tort law had become a largely symbolic apparatus for assigning liability for what was perceived as an entropically degenerative hazard. This process of allocating responsibility, even if only rarely monetarily rewarding, was a reassuring method of conceptually containing the phenomenon of pollution. The blame apparatus of tort law thus allowed the late-Victorians to construct a discrete one-to-one ratio between the problem of industrial emissions and its origins, even if that relationship was clearly only symbolic. It was generally acknowledged that the lack of a functional scheme of collective liability made this assignment of responsibility random at best.

This emotional reliance on the symbolic resonance of tort law blinded reformers to even those alternate avenues of liability allocation that they had considered during debates about workplace safety. No proposals for a mandatory insurance scheme as an alternative to nuisance actions ever emerged during discussions about pollution, "notwithstanding . . . the publicity which insurance proposals as a means of victim compensation were attracting in the adjacent sphere of workplace injuries" (Pontin 676). This failure to consider a mandatory insurance scheme is particularly curious not only because it was being simultaneously discussed in the context of employee safety, but also because insurance would have been especially well suited to address the collective liability problem. Factories operating in one town or urban subdivision could have bought into a centralized insurance scheme that would cover the damages incurred by that area's inhabitants. An alternate solution that would mandate that all urbanites purchase such insurance was also never discussed. Since the physical and, to a lesser extent, property harms resulting from exposure to industrial emissions were unpredictable (insofar as it could not be guessed with any accuracy which residents would display symptoms), insurance would have been at the least a solution worth exploring.

This inability to even consider an insurance regime in the context of pollution was a consequence of an emotionally-driven rather than rational distinction between non-entropically degenerative and entropically degenerative harms. The late Victorians' repeated failures to address the problem of industrial emissions through judicial or regulatory channels further exacerbated the misconception that it could not be controlled. Indeed, the dogged and impractical reliance on demonstrably inadequate tort remedies was itself born of a desire to contain what the Victorians feared was uncontainable. By

assigning even a reductive origin to the collective problem of industrial emissions, they plugged pollution anxiety into the comforting framework of containment. While this process amounted to little more than matching a crisis to a false cause, the self-deception reassured the Victorians even as it adversely restricted the pool of available solutions to a problem that could only have benefited from a multiplicity of perspectives.

CHAPTER FOUR
Making Sense of Holmesian Logic Through Contagious Vampirism

In Chapter One, I argued that the final decades of Britain's Victorian Age were marked by anxiety about what I called entropic degeneration. As contemporaneous advances in industry and biology and the emergence of new areas of inquiry within the social and natural sciences destabilized numerous conceptual categories that had previously been perceived as immutable, Victorian literature and jurisprudence began exhibiting a longing for interpretive strategies that promised to reaffirm eroding conceptual boundaries by imposing order on chaos. This was especially apparent in literary and legal treatments of pollution, which to many late Victorians seemed a physical manifestation of entropic degeneration.

As I discussed in Chapter Two, this longing for stability surfaced with particular vehemence in late-Victorian detective fiction. In the Holmes stories, for example, relationships between objects and their role in the story appeared direct and immutable—every object had a single, well-defined purpose—a ratio that satisfied readers' longing for order and stability. Even Holmesian logic, however, broke down when applied to phenomena that resisted a neat one-to-one interpretation. While Doyle went so far as to depart from his usual scientific accuracy and re-characterized literal pollution as beneficial so as to make it compatible with the demands of Holmesian logic, M.P. Shiel challenged the limits of Holmesian logic with the unnarratable phenomenon of madness. It is only when Zaleski's narrative encounters the specter of the Orvens' degenerative insanity that his Holmesian strategy fails and we, as readers, are forced to reevaluate our own reliance on its reductive, if reassuring, calculus. Whereas Shiel concludes his

narrative rather than face a clue that cannot be made comprehensible within the bounds of Holmesian logic, Bram Stoker takes a different approach. In this chapter, I will explore what I see as Stoker's decision to harness his characters' anxiety about entropic degeneration and make of it an instrument of meaning-making in *Dracula*.

Having his band of vampire hunters embrace Holmesian logic, Stoker gradually exposes it as powerless against a foe who—in a radical departure from Romantic treatments of vampirism—not only resists definition within one conceptual category himself but simultaneously infects his pursuers with the taint of multivalence. Labeling their monster a vampire, the vigilantes naively assume that he will behave according to certain established Holmesian rules only to find the Count inexplicably roaming at noon and escaping capture as a cloud of dust when staked. In allowing his protagonists' reliance on a one-to-one relationship between the clue of Dracula and its meaning to thwart their interpretive and, in turn, vampire-slaying efforts, Stoker implicitly acknowledges that the Holmesian insistence on discrete meaning is fundamentally reductive. This observation is, of course, hardly unique to Stoker's novel; continental authors like Joris-Karl Huysmans made the same point with appreciably greater eloquence well before *Dracula*'s publication. But in describing his creature as a species of pollutant, Stoker makes Dracula not only multivalent but also—and uniquely—a mechanism for producing multivalence in his intra-textual and extra-textual readers. Ultimately, Stoker makes his eponymous villain a multivalent pollutant capable of reproducing in others the threat of entropic degeneracy that he himself embodies.

The question of Dracula's nature can, of course, productively be scrutinized through any of a number of interpretive lenses; indeed, the tomes of critical work on the

novel are a testament to *Dracula*'s multivalence in the academy. Rather than argue against these approaches, I focus on the Count's narrow role as a degenerative pollutant in an attempt to offer a complementary interpretation that befits the scope and purpose of this project. But before fully exploring Dracula's role as a vector of entropic degeneracy in Stoker's novel, it will be helpful first to situate the Count among the vampires who preceded him. Rather than an amalgamation of earlier incarnations of the type, the Count marks a departure from the uncanny apparitions who haunted the Romantics. That departure was not only deliberate and significant but largely made possible by the availability during the 1890s of pollution as a conceptual category. As I will explain in Part I, the trope of contagious vampirism embraced by Stoker is not, as is widely believed, attributable to Eastern European superstition but rather to an Enlightenment desire to assign discrete causes to the legally confounding and socially destabilizing phenomenon of unobserved crime in close-knit villages. In Part II, I will suggest that James Malcolm Rymer's efforts to resuscitate contagious vampirism in *Varney the Vampire* proved unsustainable in large part because the trope did not offer a mechanism for vicariously addressing mid-Victorian social anxieties and so failed to resonate with readers. The lack of fit was a matter of timing: by 1845, English criminal law and tort law were sophisticated and accessible enough to address the problem of unobserved crimes even in rural communities. While agents of capitalism—a central concern in Rymer's novel—can easily (if somewhat reductively) be compared to a parasitic blood drinker, that parasite's capacity to infect others and in so doing turn them into vectors of contagion is superfluous to the analogy.

It was not until pollution emerged as a conceptual category distinct from waste during the fin de siècle that contagious vampirism gained popularity in England. As I will argue in Part III, Stoker employs this newly-available trope to both demonstrate the inadequacies of Holmesian logic and to characterize the interpretative strategy it engenders as an infectious pollutant.

Part I: Understanding Contagious Vampirism as an Effort to Assign Causes to Seemingly Inexplicable Hazards

While Stoker's villain has become the most frequently imitated and certainly the most widely recognized of vampires in western literature, he was preceded and to an extent inspired by a host of other folkloric and literary undead. Much has already been made of Stoker's reliance on folklore. Before beginning his work on *Dracula*, the author did indeed spend several years immersing himself in vampire lore. But to say only that Stoker's monster is superstition made manifest is to elide an important nuance that often goes unremarked in scholarship about the novel. Vampires, after all, are not all alike. The folkloric Slavic vampire whom critics often call Dracula's direct forebear is at best his distant cousin. The Count is, in fact, more indebted to the trope of contagious vampirism that emerged in East Prussia and the territories controlled by the Hapsburg Monarchy during the Enlightenment. Stoker's appropriation of this Germanic trope constituted a significant and deliberate departure from Romantic depictions of vampirism. Both aware of the Romantic vampire and also able to effectively replicate that pattern, Stoker nonetheless elected to cast his villain from the Germanic mold.

The term "vampir" originated in the Balkans between eight hundred and a thousand years ago, first appearing in written form in the eleventh century as a descriptor

of certain pagan groups (McClelland 32). As Orthodox Christianity replaced pagan religions and incorporated their customs, the term was temporarily used as shorthand for heretics before finally acquiring a demonic connotation. As Bruce McClelland notes, "[t]he early misconceptions about the qualities and beliefs of precisely those groups that the church could not accept or incorporate were transformed over time into folkloric notions about the vampire's features and (ritualized) activities" (52). The earliest supernatural vampires were the animated corpses of those individuals whose misdeeds, real or imagined, put them at odds with the church. The term was later expanded—presumably as a warning to observe proper burial customs—to include vengeful corpses that through no fault of their own had been mistreated after death (McClelland 55). The mistreatment need not have been especially serious or even intentional: a domestic animal could turn its late master into a vampire by merely jumping over his body (McClelland 53). Only a minor member in a pantheon of demonic creatures said to terrorize Slavic villages, the vampire was a surprisingly containable threat. When one could easily predict who might become a vampire based on the reputation of the deceased and the treatment of his corpse, prevention of vampirism could be achieved easily. Those unlucky few who became vampires, while blamed for outbreaks of blight, disease, and in some cases even for swallowing the sun during an eclipse, were nonetheless incapable of infecting others with their own affliction.

In spite of his extensive reading on the subject, Stoker may not have been familiar with the Slavic vampire. His sources, while numerous, draw almost exclusively from Germanic texts and some, like Emily Gerard's "Transylvania Superstitions," mistakenly conflated the Germanic vampire of the Enlightenment with his older Slavic predecessor.

Chief among Stoker's influences, Gerard's 1885 essay consisted of the customs she collected, expanded upon, and in some cases simply invented while accompanying the Austro-Hungarian army to the Transylvanian town of Hermannstadt in what is now Romania. Gerard characterized Transylvania as a superstitious country where "whole species of demons, pixies, witches, and hobgoblins, driven from the rest of Europe by the wand of science, had taken refuge . . . aware that [t]here they would find secure lurking-places, whence they might defy their [scientifically-minded] persecutors" (188). Gerard's sources in Hermannstadt told her of remote villages where people were supposedly terrified of both living and dead vampires. Gerard defined the former as the illegitimate child of two illegitimate parents, and the latter as a person who, irrespective of the circumstances of his birth, was ultimately killed by what she dubbed a "nosferatu" (185). Anyone so murdered would "continue to suck the blood of other innocent people till the spirit has been exorcised" (Gerard 185). This could be accomplished "by opening the grave of the suspected person, and either driving a stake through the corpse, or else firing a pistol-shot into the coffin" (Gerard 185). In particularly difficult cases, villagers "recommended to cut off the head [of a vampire], and replace it in the coffin with the mouth filled with garlic, or to extract the heart and burn it, strewing its ashes over the grave" (185). Gerard claimed that these procedures remained commonplace throughout the eighteenth century and well into the nineteenth, noting that there were "probably few Roumanian villages where such have not taken place within memory of the inhabitants" (185).

Gerard's account quickly gained popularity in England. In 1888, an anonymous article published in *Blackwood's Edinburgh Magazine* expanded upon her claim of

authenticity, reporting that "what Madame Gerard has to say about the ghastly vampire superstition" was in fact an accurate "recital of the present condition of the popular belief" (563). The article, entitled "The Land Beyond the Forest," claimed that "[i]n the *nosferatu* or vampire every Roumanian peasant, to this day, is a firm believer," speculating that much of the "cumbrous funeral ceremonial" that Gerard observed in Hermannstadt was principally "intended to prevent the dead from entering upon evil courses after their burial" (563). This late-Victorian emphasis on authenticity—or at least on the belief in authenticity on the part of foreigners—was a fairly novel development in the genesis of the literary vampire; certainly the same claims were not made with respect to Romantic vampires like Samuel Taylor Coleridge's Geraldine or John Polidori's Lord Ruthven.

Even more interesting is the description of vampirism as a communicable illness. Gerard first evoked the discourse of contagion during what was likely a linguistic error. There is no evidence to suggest that her term "nosferatu," which did not appear in any European dictionary, was anything but an accidental coinage based on the Romanian word "nesuferit," or "plaguesome" (Skal 80). But while Gerard did note that her sources viewed vampirism as something that could be transmitted to anyone who had been "killed by a nosferatu" (185), the article went considerably further by drawing analogies with particular maladies. According to its author, vampirism constituted a "terrible plague" that was "as contagious as the small-pox" (563). The article speculated that any "village where vampirism was prevalent on a large scale, must have enjoyed the same cheerful sense of security as a district feels when it lies in the path of an advancing wave of cholera" (563). *Blackwood's* comparison of vampirism to cholera is all the more

interesting because it followed so closely on the heels of Robert Koch's isolation of the cholera bacillus in 1883. The breakthrough had led Koch to confirm that cholera was spread through contaminated water, further cementing the link between environmental pollutants and illness. In describing the affliction as something akin to cholera, therefore, the article suggested that vampirism functioned not only as a contagion but also as a kind of environmental pollutant.

According to *Blackwood's*, that pollutant festered in the blood of even those victims who had been fortunate enough to survive a vampire attack. The article warned that should "a vampire once get out of his grave and suck the blood of an innocent person, that person is at once inoculated, and only waits for his death and burial to break out for the gratification of his unclean tastes, and to propagate the plague in fresh quarters" (563). Unlike Gerard, who mentioned the phenomenon of the living vampire only briefly and did not dwell on the disturbing notion that a victim, once infected, became a mobile host, *Blackwood's* popularized the idea that the pollutant of vampirism might lay dormant in living individuals. Complaining that Gerard reported "nothing about the intense panics" that this fact was "said to have periodically caused in Transylvania as in Hungary," the article noted that, "what [was] more to be regretted, she [did] not satisfy our curiosity as to how living vampires succeed in carrying on their operations" (563). While the article itself offered few concrete answers, it did instruct readers in the proper treatment of those who had already become vampires. "A thorny sprig of wild-rose laid across the coffin" was said to provide a helpful talisman, and while the most common method of dispatching a vampire was to "open [its] grave . . . and drive a stake through the body," other "[l]ess irreclaimable" cases required a vampire hunter to "fir[e] a pistol-

shot into the coffin" or "walk[] round the grave smoking, on the anniversary of the vampire's death" (563). The contagion could not, however, be purged from living hosts, and because those hosts were indistinguishable from unaffected individuals, the threat of vampirism could never be contained, much less eradicated.

This representation of vampirism as an uncontainable pollutant was neither Slavic nor Romanian, and certainly nowhere near as old as Gerard's sources had led her to believe. Indeed, the idea that vampires spawn new vampires by biting them is not a feature of any Eastern European folkloric tradition. As McClelland notes, "[i]n Slavic folklore, the vampire may have some connection with personified disease, a link that goes back even to the eleventh century, but the idea that a vampire is caused by another vampire seems to occur rather late" and not until the figure entered the Protestant imagination (84). The tales that Gerard attributed to the Transylvanian villagers actually originated in East Prussia and the Hapsburg territories, where the vampire "'crossed over' from the land of Orthodoxy into the land of Counter-Reformation Roman Catholicism and Protestantism" (McClelland 84). The idea, it would seem, "emerged alongside an increasing Enlightenment tendency to discover rational causes behind all kinds of phenomena, including epidemic diseases and so-called supernatural events" (McClelland 84).

Gerard was correct in characterizing the contagious vampire as a rustic rather than urban superstition. But the appeal of the idea of vampirism had less to do with an absence of sophistication than with the social and legal pressures occasioned by living in small groups where an undetectable but perpetually guilty vampire could serve as a convenient and discrete scapegoat for both overtly threatening and merely inexplicable events. As

McClelland points out, “in a society lacking an extensive tort code and where neighbors must often depend on each other’s help for provisioning in the face of unpredictable natural occurrences, there is very good reason to avoid direct accusation of other (living) members of the community when guilt is not unambiguous” (84). The vampire who can not only assume responsibility for any baffling incident but also remain a perpetual threat through the infection of successive hosts becomes, “[i]n the absence of any officially sanctioned group . . . on whom it is possible to heap blame with impunity,” a communally therapeutic fiction (McClelland 84). Indeed, there are documented reports of collective attacks on the corpses of purported vampires in the Hapsburg territories following misfortunes ranging from unsolved murders to outbreaks of disease and blight. Such incidents became more frequent throughout the eighteenth century. It is important to note, however, that none of these so-called vampire epidemics predated the influx of Germanic culture or Enlightenment influences on the affected villages. The famous cases of Peter Plogojowitz and Arnold Paole, two Serbian peasants suspected of infecting their family and neighbors with vampirism after death, were investigated, confirmed, and extensively documented by Austrian officials.

Given the conditions surrounding its genesis on the continent, it is hardly surprising that the notion of contagious vampirism should enjoy such popularity in England during the fin de siècle. The same late-Victorian readers whose longing for reassuring one-to-one ratios between baffling phenomena and their meanings led them to respond so enthusiastically to Holmesian logic found themselves equally attracted to the trope of the infectious vampire. I do not mean to suggest, of course, that Gerard’s readers actually subscribed to the superstitions she recounted. By the nineteenth century, the

English enjoyed a criminal code that was sufficiently nuanced to obviate the need for individual vampiric scapegoats; there are no cases, for example, of either Londoners or their rural countrymen mutilating corpses for fear of the undead. And while Victorian tort law was in many respects equally nuanced, it was—as I explained chapter three—ill equipped to deal with the novel challenges posed by uncontainable airborne pollutants. Gerard's readers need not have accepted the vampire as real in order to imagine it as a pollutant and find significant appeal in fictions suggesting that the threat it represented could be subdued.

The popularity of the vampire during the fin de siècle should, therefore, be understood as a consequence of his infectious rather than merely undead or exotic nature. Indeed, the transformation of the Slavic vampire into an infectious threat during the Enlightenment and the subsequent appropriation of that figure by late Victorians like Gerard and Stoker is responsible for the continued survival of the vampire trope. The vampire never gained particular prominence in Eastern Europe, where it was viewed as only one nefarious creature among a host of other wraiths and specters. In the West, however, "where there was a more comprehensive and effective attempt to push all traces of pre-Christian religion underground . . . the vampire's incursion provoked a true fascination with the return of the abject or repressed" (McClelland 87). Ultimately, that incursion would not have occurred were it not for the vampire's metamorphosis from a mere fiend into a vessel that might express Victorian anxieties about pollution. As McClelland aptly points out, "[i]t is almost as if the change of context enabled the vampire to survive and grow stronger, by providing him with a new, metaphoric function,

while further obscuring the folklore's roots in collective violence and social iniquity" (87).

If the Victorians responded to the trope of the contagious vampire at least partly because—in his capacity to infect others—he embodied their anxieties about various species of pollution, the opposite also holds: the infectious vampire needed those anxieties to flourish in the late-Victorian imagination. While Gerard may have popularized the contagious vampire among the English, she was hardly the first to attempt the feat. In 1759, French theologian Dom Augustine Calmet's 1746 treatise on demons and vampires was translated into English. While the treatise was noncommittal about the authenticity of vampires, it described the trope of the contagious vampire with vivid clarity. Voltaire found the idea so compelling that he gave it considerable attention in his *Philosophical Dictionary*, defining vampires as "corpses, who went out of their graves at night to suck the blood of the living, either at their throats or stomachs, after which they returned to their cemeteries" (371). According to Voltaire, "[t]he persons so sucked waned, grew pale, and fell into consumption; while the sucking corpses grew fat, got rosy, and enjoyed an excellent appetite" (371).

Accounts of contagious, blood-imbibing vampires continued to make their way to England during the early nineteenth century. Written in the 1730s but not published until 1809, the anonymous *Travels of Three English Gentlemen from Venice to Hamburg* purported to deliver an authentic account of vampirism. Basing its commentary on the reports of vampire epidemics in Germany during the early 1700s, the travelogue marveled that though vampiric corpses "have been much longer dead than many other bodies, which are putrefied, not the least mark of corruption is visible upon them"

(*Travels* 375). The author cautioned that, because those who were killed by vampires inevitably become vampires themselves, "to prevent so spreading an evil, it is found requisite to drive a stake through the dead body, from whence, on this occasion, the blood flows as if the person was alive" (*Travels* 375).

But these Germanic vampires, though indistinguishable from the creatures that would capture the late-Victorian imagination when described by Gerard, were not embraced by the Romantics. While writers during the late eighteenth and early nineteenth centuries were arguably as intrigued by the general idea of vampirism as their Victorian heirs, their interpretation of the trope was much different. As James B. Twitchell explains in *The Living Dead*, the Romantics were interested in vampirism as a metaphor for psychological concerns and did not care about vampires as such. To the contrary, "they rarely if ever wrote about vampires as vampires; instead the vampire was the means to achieve various ends" (Twitchell 38). Repulsive blood drinkers threatening contagion were re-imagined as seductive aristocrats who could prey on their victims' desire for companionship.

Coleridge's Geraldine is one of the earliest and best known incarnations of this species of vampirism. While she is never labeled a vampire, Geraldine's spectral appearance, hypersensitivity to religious objects, and inability to enter Christabel's home unless explicitly invited is, as Twitchell puts it, "simply too much vampire evidence to ignore" (41). While Geraldine does not feed on blood, she is no less a predator than her Germanic counterparts. Targeting the emotionally fragile Christabel, the vampire lures the lonely girl into a simulacrum of friendship. From its very outset, that relationship is both premised upon and facilitated by the similarities between the two. The motherless

Christabel is initially attracted to Geraldine because the vampire represents the possibility of female companionship; as William Ulmer aptly notes, Geraldine almost immediately "usurp[s] . . . the role of the mother" (394). As the events of the poem unfold, the similarities between Geraldine and her victim become increasingly pronounced, and the boundaries between them blur. When the "lovely maid and the lady tall . . . [e]nter the Baron's presence room," the reader is left to guess which is the former and which the latter (Coleridge 259). Indeed, Christabel imitates Geraldine's "look of dull and treacherous hate" so completely as to develop "unconscious sympathy" with the vampire (Coleridge 265). Geraldine functions therefore as not only a "double of the mother," but also a "double of Christabel" herself (Ulmer 394). As Nina Auerbach notes in *Our Vampires, Ourselves*, the girl "is so imbued with Geraldine that . . . she can only turn into her" (50). By the poem's conclusion, "[v]ampire and victim are so entwined" as to become interchangeable (Auerbach 50).

Drawing heavily on Coleridge's piece, Polidori makes his own vampire more overtly social than Geraldine. The victim, however, is essentially a male version of Christabel. Young and lonely, Aubrey is "attached . . . to the romance of his solitary hours" until he falls under the vampire's spell (Polidori 49). Hardly the repulsive predator of the night, Ruthven is an accomplished socialite whose "winning tongue" makes him irresistible in European salons (Polidori 48). Rather than threatening those around him, "his peculiarities" inspire awe and "cause him to be invited to every house" (Polidori 47). Like Geraldine, Ruthven lures victims with the promise of camaraderie. He is dangerous precisely because "all wish to see him" and all are "pleased at having something in their presence capable of engaging their attention" (Polidori 47). He enters Aubrey's life as an

equal and a companion, penetrating the young man's social sphere by presenting himself as just another listless nobleman. As David Morrill notes, the success of Ruthven's vampirism is predicated on his ability to mimic those around him; "[a] dark and mysterious nobleman who frequents the fashionable salons of London . . . Ruthven becomes something of a violent thrill to the bored minions of high society" (3). Like Dracula after him, Ruthven drains Aubrey vicariously through the women in his life but, unlike the Count, he mediates that vampirism through a friendship so intimate as to efface the possibility of retribution. Aubrey never considers vanquishing Ruthven; as Auerbach sums up, the vampire's "dreadful power springs from [Aubrey's] oath of friendship" (16).

With the publication of Sheridan Le Fanu's *Carmilla* in 1872, the Romantic vampire stepped into the Victorian Age. Unlike the few Victorian vampires who preceded her, Carmilla was consistently and thoroughly Romantic. Le Fanu's novella begins in Styria, where the motherless Laura pines for a friend who might understand her. Far from England and with only her father and aloof governesses for company, Laura misses not only female companionship but also the companionship of someone who is sufficiently like her in all other respects. When a carriage accident brings Carmilla into Laura's social orbit, that need for familiarity is met. Carmilla thoroughly echoes her victim: both are young, aristocratic, and spend their waking hours gazing at each other as one would in a mirror. When Carmilla does eventually attack Laura, the bite leaves the girl physically depleted but not contagious. While Le Fanu implies that Carmilla is a blood drinker, his tale is more preoccupied with water imagery. Of the many "vague and strange sensations" that color Laura's dreams, the "prevailing one [is] of that pleasant,

peculiar cold thrill which we feel in bathing, when we move against the current of a river" (Le Fanu 307). As Auerbach explains, for Le Fanu, "the strangeness of vampirism is its kinship to the commonplace" and its "identification with cold water rather than hot blood . . . releases it from . . . perversity" and from the possibility of contagion (44).

Carmilla's vampirism is less concerned with propagating her species than it is with bringing her into an even fuller communion with her victim. She promises Laura that they will be "one for ever," explaining: "I live in your warm life and you shall die—die, sweetly die—into mine" (Le Fanu 291). This ease with which she makes posthumous unity enticing to the girl constitutes the defining mechanism of Carmilla's vampirism. Unlike Germanic vampires, who could achieve the physical infection of multitudes with one bite, Carmilla pursues spiritual union with one chosen victim through a kind of extended courtship. As Baron Vordenburg explains near the conclusion of the tale, Carmilla "is prone to be fascinated with an engrossing vehemence, resembling the passion of love, by particular persons," in pursuit of whom she "will exercise inexhaustible patience and stratagem" (Le Fanu 337). But persistence, while necessary, is insufficient. Carmilla also requires "something like sympathy and consent" in order to gain sustenance from her prey (Le Fanu 337). In this context, the actual act of biting becomes merely symbolic, while the true work of vampirism rests in persuading the victim to freely participate in her own victimization.

"[L]ess an account of predation than it is of the recognition that underlies all vampire literature before the close of the nineteenth century," Le Fanu's tale offers a useful exemplar of Romantic vampirism (Auerbach 42). Its publication date notwithstanding, *Carmilla* embodies all of the salient features of the trope. She selects a

specific victim to the exclusion of others, becomes its doppelganger, and then, promising unity, seduces it into a parasitic relationship. Even the sexual valence of that relationship emphasizes similarity rather than otherness. As Marjorie Howes notes, "*Carmilla* portrays a homosocial bond between women that explicitly shades off into the homoerotic" (Howes 119). Indeed, the tale can productively be read as a "narrative of female empowerment" wherein a lesbian relationship is posited as a means of subverting "the traditional structures of kinship by which men regulate the exchange of women to promote male boding" (Signorotti 607). Because Carmilla's assault on Laura depends upon resemblance and consent, it is better understood not as contagion by an external pathogen but as a return of the repressed. Carmilla is as much the personification of Laura's unarticulated sexual desires as Ruthven is a personification of Aubrey's, making her—like any Romantic vampire—more akin to a mirror than a pollutant.

Unlike their Germanic counterparts, Romantic vampires perpetually "oscillat[e] between corpse, gentleman, and ghost mirrors," an "ontological slipperiness" that makes them "[n]either sharer nor predator, but some compelling creature in between" (Auerbach 38). It should be noted that this vacillation is of a different kind than the volatility that marks Rymer's Varney. As I will explain at length in Part II, Varney is an unstable character because he morphs—suddenly and inexplicably—from a contagious Germanic vampire into something that faintly approximates the Romantic trope. In his case, however, the change serves no narrative purpose; indeed, it is likely that Rymer was guided by popular taste rather than artistic vision.

Part II: Explaining the Failure of Contagious Vampirism During the 1840s as a Consequence of its Prematurity

While the popularity of the Romantic vampire peaked during the middle of the nineteenth century, the contagious vampire languished in relative obscurity, save one notable exception. Serialized in penny dreadfuls between 1845 and 1847 and eventually published in book form, Rymer's *Varney the Vampire* was a sprawling, cumbersome, and somewhat unpredictable epic about an aristocratic vampire who initially embodied the tropes of Germanic vampirism. I intend to evaluate Varney's erratic character in light of Victorian attitudes about pollution, an analysis absent from existing critical discourse about the novel.

In spite of its inelegance, the novel introduced its Victorian audience to a vampire tale that was markedly different from those of the Romantics. As Alok Bhalla persuasively argues, Rymer's work was "much more immoderate and menacing in the quality of its prose and much more grotesque in its descriptions of sexual sadism" (20). Prefiguring Dracula, Varney was the first English vampire to abandon the isolated manor houses of swooning aristocrats and prey on the hardy urban middle class, thus implicating the industrial city as a "new area of contagion and the red-brick house [as a] site of predatoriness" (Bhalla 20-21).

Like Dracula, Varney begins his novel as a brutal monster who feasts on the blood of innocent victims. Rymer begins by establishing Varney's appearance as grotesque: his "dreadful . . . eyes look like polished tin," his "lips are drawn back" in a perpetual snarl, and his teeth "project[] like those of some wild animal, hideously, glaringly white, and fang-like" (14). He moves with "a strange, gliding movement," creating a nauseating "clash[ing]" noise with "long nails that literally appear to hang

from the finger ends" (Rymer 14). Varney's assault on Flora Bannerworth, the novel's first victim, is arguably more disturbing than Dracula's, if only because Lucy's attack is only implied and Mina's interrupted midstream. Rymer, on the other hand, describes his vampire pouncing on Flora with "a strange howling cry that was enough to awaken terror in every breast," then "seiz[ing] the long tresses of her hair, and twining them around his bony hands [as] he [holds] her to the bed" (Rymer 16). The assault becomes increasingly sexualized as it progresses. Flora's "bed-clothes [fall] in a heap by the side of the bed," and the shrieking girl is "dragged by her long silken hair completely on to it again" (Rymer 16). As "[h]er beautifully rounded limbs quiver[] with the agony of her soul," Varney's "glassy, horrible eyes" peruse her "angelic form with a hideous satisfaction—horrible profanation" (Rymer 16). It is at this intersection of violence and sexuality that Rymer locates the most salient feature of Varney's vampirism. Having already established his vampire as a bestial predator, Rymer now makes Varney a blood drinker. Still dragging Flora by her hair, "[w]ith a plunge he seizes her neck in his fang-like teeth—a gush of blood; and a hideous sucking noise follows" (Rymer 16). She swoons, "and the vampyre [resumes] his hideous repast" (Rymer 16).

Although Flora survives the encounter, she does not escape unscathed. Having some familiarity with Germanic folklore, Flora's brother quickly surmises that the attack was vampiric in nature and that his sister has been infected. Rymer makes the link between Varney and contagious vampirism explicit, suggesting that Flora is now afflicted with "[t]hat dim and uncertain condition concerning vampyres" which, "originating probably as it had done in Germany, had spread itself slowly, but insidiously, throughout the whole of the civilized world" (593-94). The repercussions of Flora's defilement,

therefore, are at once global and local, social and physical. The other characters begin to view her as a fallen woman who is somehow complicit in her own assault. Even the puncture marks on Flora's neck assume a perverse significance; other potential victims "regard the scars upon [her] body as so many signs of the fault or the curse of the victim herself instead of reading them as signs of the obscenity" of her attacker (Bhalla 25).

Rymer makes it clear that Varney's influence alters Flora on a more fundamental level. The Bannerworths' friend Mr. Marchdale concludes that, because Flora "has been attacked by a vampyre," there was a possibility that "after this mortal life shall have ended" she too, "with all her beauty, all her excellence and purity of mind . . . should become one of that dreadful tribe of beings who cling to existence by feeding, in the most dreadful manner, upon the blood of others" (Rymer 177). Flora's contagious vampirism makes her a threat even to those who are yet to be born, imbuing her with the kind of monstrous maternity that critics so often ascribe to Dracula. Marchdale asks Flora's fiancé to imagine "for a moment, the mother of [his future] babes coming at the still hour of midnight to drain from their veins the very life blood she gave them," driving their hypothetical family "mad with the expected horror of each visitation," and making their "nights hideous" and their "days but so many hours of melancholy retrospection" (Rymer 178). Unable to continue, Marchdale laments that Flora's affliction is "too dreadful to contemplate! Too horrible—too horrible!" (Rymer 177).

While it is tempting to attribute both Marchdale's initial over-reliance on hyperbolic language and the ultimate breakdown of that language to Rymer's artistic limitations, the hysteria does serve a purpose. Rymer begins the novel by evoking a sense of oppressive excess. In those early scenes "everything is out of proportion," the darkness

is too black, the silence too deep, and the night too still (Bhalla 21). When faced with the threat of vampirism either directly or indirectly, the novel's characters react with terror so overwhelming as to render them speechless: Flora shrieks incomprehensively while Marchdale falls silent. Their reactions are hardly surprising, as the Varney of the first few chapters is indeed a totalizing force, a social and physical pollutant "from whose power it is impossible to escape into a saner, a more rationally comprehensible social order" (Bhalla 25).

But the start of Rymer's novel is hardly representative of what follows. The Germanic vampire who attacks Flora transforms by the novel's end into a far less dangerous and appreciably less contagious threat. Flora does not turn into a vampire, and she is never attacked or so much as threatened by Varney again. Indeed, by the twentieth chapter, her interactions with the once-horrifying vampire are best described as congenial. After Varney's plans to purchase Bannerworth Hall bring him into conflict with Flora's brothers, he visits her again. Once revolting, the vampire is now perfectly ordinary and even attractive. There is a "wonderful fascination" in his manner, his "voice sound[s] like music itself," and his "words flow[] . . . with all the charm of eloquence" (Rymer 300). In spite of "her trembling horrors of [the] man" and "her fearful opinion," Flora is struck by "an irresistible wish to hear [Varney] speak on" (Rymer 300). Rymer's description of Varney as a "man" is telling. As the tale progresses, "the vampire and the socialized characters become increasingly difficult to distinguish" (Auerbach 29). By the conclusion of the novel's first volume, the narrator and characters alike are "pleased to find that Sir Francis Varney, despite his singular, and apparently preternatural

capabilities, has something sufficiently human about his mind and feelings, to induce him to do as little injury as possible to others in the pursuit of his own objects" (Rymer 867).

Those goals, like Varney's affect, grow less vampiric with time. Abandoning what initially promised to be the central preoccupation of the novel—namely Varney's contagious physical parasitism—Rymer now explores its economic dimensions. The consummate capitalist, Varney becomes more interested in acquiring wealth than in imbibing blood. Indeed, after the first chapter, we rarely observe him doing the latter. As Auerbach suggests, "[t]he power he seeks is neither sexual nor theological; unlike Frankenstein's creature or Dracula, he has no Darwinian ambitions for the triumph of his species over humans; like most middle-class mid-Victorian males, he wants only money" (30). Ultimately, it is this voracity for worldly goods that "marks [Varney] as the paradigmatic citizen of a decade named the Hungry '40s" and in so doing facilitates his transformation from a contagious threat to a sympathetic character who is largely indistinguishable from the humans around him (Goddu 129). His participation in a pursuit as characteristically human as wealth acquisition "emphasizes Varney's human traits and makes him a more sympathetic character" (Senf 46). A comparison between Varney and some of Rymer's less palatable human characters redounds to the vampire's favor. Marchdale, for example, schemes to rob his friends the Bannerworths, while Mrs. Meredith and Mrs. Williams are perfectly willing to exploit their daughters in exchange for access to Varney's assets. Ultimately, "by stressing the cruelty of human beings, the author makes Varney appear even less cruel" (Auerbach 46).

Recognizing that his financial success depends upon his capacity to peacefully coexist with others, Varney goes a step further by establishing friendships with the

humans around him. Different from the individual bonds forged by Romantic vampires, Varney's friendships are not exclusive and "embrace[] not a sole chosen spirit, but an entire society" (Auerbach 28). According to Auerbach, Varney's general friendliness can be understood as a kind of ongoing personality crisis. While Varney "does his best to look preternatural . . . he continually, helplessly, reverts to the more unsettling human condition of friendship" (Auerbach 28). This proximity to humans leads Varney to cultivate some of the nobler human emotions. After witnessing the mob murder a young woman he previously turned into a vampire, Varney laments that although he was sure that he had "steeled [his] heart against all gentle impulses" and "completely crushed dove-eyed pity in [his] heart," he was nonetheless "still sufficient of [his] once human feelings . . . to make [him] grieve" for the girl (Rymer 568).

It is Varney's inability to shed these human emotions that ultimately precipitates his downfall. Having evolved into an individual who is at once remarkably sensitive to the cruelties of the world and profoundly guilt-stricken about his own past, Varney elects to put an end to his tortured existence by jumping into Mount Vesuvius. There, "tired and disgusted with a life of horror, he [flings] himself in to prevent the possibility of a reanimation of his remains" (Rymer 1220). While the vampire cannot persist in a world motivated by greed and cruelty, his tormentors thrive. As Carol A. Senf points out, "[a]lthough Varney eventually becomes disgusted with his bloodthirsty deeds, the human characters seemingly never tire of their cruelty, either to Varney or to each other" (47).

This capacity to exhibit compassion and remorse makes Varney an indeterminate, unpredictable character who is neither consistently vampiric nor reliably human. While Rymer certainly paints him as a nauseating Germanic vampire throughout that first

encounter with Flora, Varney is later described as a relatively ordinary aristocrat. No longer the horrific fanged creature that would later inspire Max Schreck's performance in *Nosferatu*, Varney is remarkable only for his "lofty stature, the long, sallow face, the slightly projecting teeth, [and] the dark, lustrous, although somewhat somber eyes" (Rymer 194). Varney's personality is as unstable as his physical appearance. His relationships vacillate from predatory to friendly with so little explanation as to leave other characters and readers wondering whether he is in truth "spirit or goblin, gentleman or fiend, human or creature" (Auerbach 29).

The inconsistencies are legion; as Senf puts it, "in numerous scenes . . . Varney is a character who might have come straight from folklore," while in others "there is even a question whether Varney *is* a vampire" (45). In his one attempt to explain Varney's origins scientifically, Rymer raises that very question. After recognizing that "[h]uman nature truly delights in the marvellous," he has Dr. Chillingworth coolly explain that he reanimated Varney following a botched execution by means of a galvanic experiment (Rymer 593). While this revelation should strip the vampire of any claims to the supernatural by casting him in the mold of Frankenstein's creature who, while unusually strong, possesses no paranormal powers, Varney's identity remains at once confusing and confused. A hangman wonders why the vampire would choose to "*enact* such a character," Chillingworth denies the possibility of miracles and insists on finding "some rational and some scientific means of accounting for the phenomenon," while Varney himself remains convinced of his own vampirism (Rymer 127, 1019, emphasis added). Admiral Bell finally sums up the futility of seeking to categorize Varney, pointing out that he is a vampire in his own opinion and should therefore be one in the eyes of others.

E.F. Bleiler reaches a similar conclusion in his introduction to the novel, pointing out that Varney is alternatively identified as a sixteenth-century supernatural being, as "a turncoat from the days of the Commonwealth, sentenced to be a vampire because he had killed his son in a moment of rage; or as a modern criminal, not at all supernatural, who had been revived after being hanged" (xv). Varney's indeterminacy is erratic: at times he behaves as a Germanic vampire, at others he seems thoroughly human.

Critical responses to this inconsistency in Varney's character are generally negative, and fall into one of two categories. The first group vindicates Rymer by arguing that *Varney the Vampire* was composed by not one but multiple authors who demonstrated little interest in narrative consistency. Twitchell, for example, paints a vivid picture of a small Salisbury Square office where teams of harried scriveners churned out reams upon reams of artistically compromised but commercially successful potboilers (123). According to him, the evidence of distinct authorship is abundant throughout the second half of the epic, where the tale devolves into a series of seemingly unconnected episodes. Rymer himself, Twitchell claims, was likely responsible for only the first, well-written third of the novel (123).

Most critics, however, are not as kind to Rymer, attributing the many perceived faults in *Varney the Vampire* to his shoddy storytelling. Louis James, who inherited Rymer's original proof copy and several of his scrapbooks, concluded that he was responsible for the vast majority of the novel (36). Those who have adopted James's conclusion almost uniformly disparage Rymer's prose and are quick to suggest that Varney's popularity among Victorian readers is a testament to their unsophisticated literary tastes. As Senf puts it, the novel "was written at breakneck speed for an

unsophisticated literary audience that was apparently more interested in fast pace and galloping suspense than in coherence or subtle character development" (42). Mary Hallab similarly characterizes Rymer's work as a hopeless if fascinating exercise in "superficial silliness and various inconsistencies" (24), while Louis H. Palmer calls the author's workmanship "inconsistent and self-contradictory" (xiii).

Auerbach alone gestures toward a positive interpretation of Varney's erratic nature when she intriguingly suggests that the question posed on the novel's title page—"Art thou a spirit of health or goblin damned?"—already problematizes Varney's identity. Her argument that Rymer meant from the outset to explore "the vampire's perplexing amorphousness" is compelling, and sheds new light on what many have construed as errors in the text (Auerbach 28-29). But even if Rymer intended to make Varney ambiguous, that ambiguity permits of only two possibilities: Varney is either a reanimated human or a creature whose vampirism is a function of its own delusions. Both possibilities detract from the vampire's resonance as a bodily contagion.

While it is possible to debate whether Varney's instability should be understood as a consequence of composite authorship, a fault of Rymer's sloppy serialization, or instead as a calculated commentary on vampiric ambiguity, it cannot be denied that he is, for whatever reason, ultimately a poor example of Germanic vampirism. What starts as a contagious vampiric threat dissolves into a sympathetic and pitiful creature whose vampirism is, at best, diluted by human vulnerabilities. The unflattering critical interpretations and Auerbach's more forgiving reading all point toward the same conclusion: contagious vampirism was tried and abandoned, consciously or otherwise, as the novel progressed.

Printed on one of the earliest great steam presses by a Grub Street publishing house that was as proficient in the challenges of mass distribution as it was in the art of advertising, the novel was a commercial success almost immediately. The most popular of the mid-nineteenth-century potboilers, the novel was difficult to find during the early twentieth because it had, as Twitchell puts it, been "read into scraps" within a few decades of publication (122-23). The series garnered so much unprecedented enthusiasm during its two year syndication that Rymer thought it necessary to distance himself from his mass audience, characterizing his readers as "millions of minds" whose "only strong mental association . . . is *fear*" and who "have no resource between vapid sentimentality, and the ridiculous spectra of the nursery" (qtd. in Auerbach 28). Rymer's opinion of his "ignorant and weak" audience is echoed to good effect by many modern critics (qtd. in Auerbach 27). Senf's aforementioned argument about popular taste, for example, is to some extent persuasive; some readers were undoubtedly either too unsophisticated to notice or too uninterested to care about the novel's inconsistencies, so enthralled by the soap opera of Varney's life after death as to take no notice of his transformation from infectious villain to sympathetic protagonist.

But this apparent indifference to the inconsistencies in Rymer's depiction of Varney should not be discounted as solely an accident of taste. To the contrary, Varney's baffling development can productively be explained in light of the Victorian approach to airborne pollution. As I discussed in Chapter One, Rymer's audience was still decades away from recognizing the smoke billowing from English smokestacks as a pollutant capable of transforming individual humans into mobile vectors of contagion. To the

contrary, Rymer's readers still viewed smoke as an antiseptic, ascribing to miasma what their descendants would eventually understand as smoke's infectious properties.

Rymer's decision to abandon the trope of contagious vampirism was at least partially motivated by the preferences of his audience. Indeed, there is evidence to suggest that he tailored his epic based on his readers' tastes as he went along. According to James, the successive installments "show[] the author in the actual process of shifting his styles and attitudes as he tries to find a more congenial type of fiction, a movement only a long-running serial novel could illustrate" (99). But if Varney did indeed evolve to reflect the preferences of his readers, it would be useful to probe those preferences further. After all, it is not immediately apparent why, given their penchant for sensationalist popular literature, Rymer's audience should favor a noninfectious vampire over an infectious one.

The most obvious explanation is that Rymer's readers were partial to a vampire who more closely resembled the Romantic doppelgangers they already knew. Clearly, the figure of the Germanic vampire did not resonate with Rymer's readers. The early and mid-Victorians, who would have had access to works like the *Philosophical Dictionary* and the *Travels of Three English Gentlemen from Venice to Hamburg*, had shown little interest in the figure. While Varney is no Ruthven, his transformation from the pathogen that initially attacks Flora to the sympathetic ally who befriends the Bannerworths moves him toward the Romantic trope and away from the Germanic. As Milly Williamson observes, the suffering vampire was the one that Rymer's target audience of "working class Victorians . . . would have been most familiar with" (21). By making Varney more like the human characters around him, therefore, Rymer gave his readers what they

wanted. But this explanation is incomplete, and leaves at least one intriguing question unanswered: if Rymer altered Varney's nature to satisfy the popular taste for familiar, Romantic vampires, why were Gerard and Stoker not likewise compelled? In short, why were the late Victorians so much more responsive to the kind of vampire that Varney had originally meant to be?

I intend to argue that the difference in the reception of the Germanic vampire in mid-Victorian and late-Victorian popular fiction can be traced to each period's understanding of smoke as either wholesome or a noxious vector of illness, respectively. Rymer's readers did not find the infectious vampire compelling because the mechanism of contagion that would become so potent an analogy for the spread of airborne pollutants during the fin de siècle was not useful in exploring mid-Victorian concerns. Having conceptually neutralized smoke by characterizing it as a net benefit, Rymer's audience was less interested in revisiting the issue than it was in using the vampiric figure as a vessel through which they could explore more pressing matters. In Varney's case, the shift from foreign contaminant to intimate friend allowed the vampire to personify the tension between England's revolutionary past—he admits, for example, to having worked once for Cromwell—and its increasingly capitalistic present. Ultimately, Rymer's audience gravitated toward Varney not because he could infect them with an external pathogen but because he reminded them of something much closer to home.

Unlike Dracula, who infiltrates English borders as surely as he does English bodies, Varney is never presented as a foreign pathogen. To the contrary, Rymer makes his vampire quintessentially English. While the Varney who attacks Flora is seemingly without a national identity, his swift acquisition of human vulnerabilities is accompanied

by an equally swift anglicization. Shortly after the assault, Rymer implies that Varney is in fact Flora's dissolute ancestor, Marmaduke Bannerworth, who died nearly a century before the events of the novel. The "pale face, a stately brow, and a strange expression about the eyes, which no one cared to look on twice" depicted in Marmaduke's portrait are said to betray an uncanny a resemblance to Varney (Rymer 10). Rymer makes the comparison explicit by having Flora's friends exhume Marmaduke's coffin during their search for the vampire, only to learn that "no corpse ha[d] undergone the process of decomposition" there (124). Within the span of a few chapters, Varney morphs from an alien other to not only an English aristocrat, but a relative at that.

As Sara Hackenberg suggests, this early discovery in the Bannerworth vault turns Varney into a kind of "fetishistic reminder" of how the family's "past inexorably returns to haunt—and even control—the present" (63). As the tale unfolds, it becomes clear that Varney personifies not only the unsavory elements of one particular family's history, but also a collective national past. That "status as embodied [English] history grows increasingly complex as the serial continues" (Hackenberg 70). In the last of several attempts to explain his origins, for example, Varney confesses that he worked as a double agent for Cromwell and the crown only to be killed and eventually resurrected during the first anniversary of the Restoration. While the earlier investigation in the vault made Varney a vestige of the Bannerworths' familial moral trauma, this revelation inflects "England's national identity with vampiric suggestion: even as republican energy becomes a[] . . . 'raised' spirit, so too the resurrection of the monarchy is allied with Varney's vampiric regeneration" (Hackenberg 71).

Varney "represents the return of the politically repressed, shaded with radical and republican energy" and thus literalizes the sins of his audience's fathers as surely as he does the moral failings of the Bannerworth clan (Hackenberg 69). Having turned Varney into a vessel through which he could discuss England's past, Rymer "manipulate[s] the machinery of melodrama, refiguring accidents of fortune into ghastly, gleeful meditations on the relationship of human agency to the long, ever-evolving, and mercurial narrative of history" (Hackenberg 63).

Varney the revolutionary double agent is transformed into Varney the commonplace capitalist for whom money provides both sustenance and power. According to the vampire, wealth is "that greatness which [he] ha[s] ever panted for, that magician-like power over [his] kind, which the possession of ample means alone can give" (Rymer 485). Rymer's decision to make Varney's primary object money makes the vampire a transitional figure between England's revolutionary past and its increasingly capitalistic present. Varney, therefore, can be understood as a personification of mid-Victorian efforts to reconcile its past with its present. His transformation from contagious threat to sympathetic friend can also be understood as a transformation from external pathogen to internal national memory. Because the contagious dimension of Varney's vampirism was not only superfluous but in fact a hindrance to that project, it was abandoned as the series progressed. It was not until pollution became conceptually distinct from waste and a threat in its own right that late-Victorian readers felt the need for a different kind of monster.

Part III: Analogizing Holmesian Logic to a Contagious Pollutant in *Dracula*

Where Rymer experiments with the trope of the contagious vampire only to abandon it, Stoker embraces the Germanic model without reservation and to the exclusion of not only the Slavic vampire—with whom he may not have been familiar—but also the Romantic vampire, of whom he was well aware. Given Stoker's documented affinity for Gerard's tales, it would be tempting to conclude that he bypassed Romantic vampires entirely and modeled his own villain on her account alone. That assumption, however, elides an important if subtle point about Stoker's creative process: rather than ignoring the Romantic trope outright, he considered and rejected it while composing his novel. In positioning *Dracula* as a repudiation of Romantic vampire tales, Stoker invents a monster who is wholly distinct from those conjured up by Coleridge, Polidori, or Le Fanu. Unlike Rymer, who introduces his readers to a Germanic vampire only to transform him into a harmless figure, Stoker remains committed to the idea of contagious vampirism throughout his novel.

An analysis of *Dracula*'s genesis suggests that Stoker did briefly entertain the possibility of patterning the Count after his Romantic forebears. While the published novel paints Dracula as a foreign antagonist who, in spite of his attempts to emulate the English, poses a fundamentally alien threat, it is likely that Stoker's original version began much differently. Shortly before publication, Stoker excised an opening chapter that later appeared in a posthumous collection of his work (Holte 27). The piece, entitled "Dracula's Guest," details Harker's encounter with a female vampire far stronger than the three brides he would later encounter in Dracula's castle. Unlike the three seductresses under the Count's command, the Countess Dolingen of Gratz is an autonomous threat

beyond Dracula's sphere of influence. Indeed, she resembles Carmilla more closely than she does any character in Stoker's novel. Both, for example, are not only Styrian, but specifically from Gratz. Critics frequently cite the parallels between the two to suggest that Stoker patterned his novel on Le Fanu's tale. As Auerbach points out, however, the Countess "personifies an influence rejected," namely that of an authoritative woman who threatens the patriarchal hierarchy that Stoker's novel intends to affirm (66).

While Auerbach's analysis of the Countess's symbolism is apt, she does not fully explore the implications of Dracula's reaction to the assault on Harker. In having Dracula rescue the young man from the Countess's grasp, Stoker sets the two up as partners in their mutual opposition to a female threat, thus implying a kind of sympathy between them. It is only in removing the "imperial female vampire who drives Dracula into an alliance with Jonathan" that Stoker reestablishes the boundaries between the two, thereby simultaneously purging traces of Romantic vampirism and the possibility of a Romantic sympathy between human and vampire from his text (Auerbach 66).

The rescue scene that Stoker removes along with "Dracula's Guest" is markedly different from the one he retains. When Dracula pries Harker away from the three vampiric brides, his demands that they neither "touch him" nor "cast [their] eyes on him" are motivated by possessiveness rather than solidarity; Harker, he tells them, "belongs" to him alone (Stoker 43). Unlike the Countess, the triad remains physically and emotionally subordinate to Dracula. Indeed, the speed with which he neutralizes the threat of his concubines' "brilliant white teeth" only cements Dracula's supremacy in the face of Harker's passivity, and while Jonathan seems "somehow to know" the fairest of the brides, he never recognizes himself in the Count's features (Stoker 42). While Geraldine,

Ruthven, and Carmilla are each described as mirroring the physiognomies of their victims, Stoker makes a point of noting that Harker is "amazed" when he fails to see Dracula's face beside his own as they stand before a mirror (Stoker 30-31). Though "the reflection of the glass cover[s] the whole room," Jonathan's is the only face that registers, Dracula's conspicuous absence signaling his status as a foreign rather than uncanny threat (Stoker 30). This vampire, as Auerbach aptly notes, has no face because—broken attempts at mastering English notwithstanding—he is ultimately not a doppelganger capable of "insinuating intimacy" with the familiar (63).

Described as a revolting corpse whose breath is rank enough to inspire "a horrible feeling of nausea" in others, the Count perfectly embodies the trope of contagious Germanic vampirism (Stoker 24). While the Romantics left the full implications of Ruthven's foreboding gaze and Geraldine's misshapen organs unarticulated, Dracula's physical monstrosity and predatory nature are made explicit from the outset. The very sight of the vampire's monstrous body fills Jonathan with abject horror. Dracula's hands are "broad," his fingers "squat," his palms hairy, and "gouts of fresh blood . . . trickle from the corners of the mouth" to run "down over [his] chin and neck" (Stoker 24, 53). "[G]orged with blood," the Count is described as a "filthy leech," his "burning eyes . . . set amongst swollen flesh" where "the lids and pouches" lie "bloated" (Stoker 53). Neither refined like Ruthven nor sympathetic like Varney, Dracula—notwithstanding his ability to pass among the English—is at his core a creature of the cellars and not of the drawing rooms frequented by his vampiric predecessors. Harker reaches the Count's lair only after descending a steep "circular stairway" and traversing "a dark, tunnel-like

passage" redolent with a "deathly, sickly odour" (Stoker 50). This early association of Dracula with illness is borne out throughout the novel.

The Count may indeed exhibit the characteristics of a leech, but his true nature is infectious rather than merely parasitic. His assault on Lucy leaves the girl "horribly white and wan-looking" (Stoker 118). Seward laments that "[e]ven her lips were white, and the gums seemed to have shrunken back from the teeth, as we sometimes see in a corpse after a prolonged illness" (Stoker 118). The comparison of Lucy to a corpse foreshadows not only her death but also, more importantly, her eventual transformation into a vampiress. Once infected, she immediately begins to assume Dracula's cadaverous features. Under the direction of Doctor Van Helsing, Lucy's suitors—one of whom is himself a physician—respond to the situation as one would to a medical rather than supernatural problem, pumping the girl full of their own blood in an effort to counteract the Count's influence. As Auerbach and Skal point out, Van Helsing's indiscriminate transfusion now reads as medically questionable because he conducts it without regard for blood typology (Stoker 113n). Before Karl Landsteiner discovered the problem of blood agglutination in 1901, however, the procedure would have seemed a feasible solution and should therefore be interpreted as a rational, if ultimately unsuccessful, attempt to cure Lucy.

Dracula's assault not only infects Lucy with vampirism, but also makes her a mobile vector of that contagion. At night, she becomes the "Bloofer Lady" who preys on young children by drinking their blood. Like Dracula's vampirism, Lucy's attacks leave the children "terribly weak, and . . . emaciated" (Stoker 160). Her strength increases as she grows more fully vampiric. By the time her transformation is complete, and Lucy's "sweetness [has] turned to adamantine, heartless cruelty, and the purity to voluptuous

wantonness," she poses an infectious threat to adults as well (Stoker 187). She seduces Arthur into a spell that has him leaping into her arms until he is saved by the timely appearance of Van Helsing's crucifix. Arthur's "sore trial," as Van Helsing later calls it, is not merely an emotional one. While Stoker leaves the threat of infection implicit, he suggests that an embrace with the vampiric Lucy—whom he compares to Medusa—would have resulted not only in Arthur's death but in his transformation into a vampire as well (188). The band of vampire hunters interprets Lucy's capacity to infect others as evidence of Dracula's true nature as a Germanic vampire. It is only after her predation on children becomes obvious that Van Helsing calls the Count a "*nosferatu*," explaining that when his victims turn into vampires "there comes with the change the curse of immortality; they cannot die, but must go on age after age adding new victims and multiplying the evils of the world; for all that die from the preying of the Un-Dead become themselves Un-Dead, and prey on their kind" (Stoker 190). According to Van Helsing, this cycle of contagion "goes on ever widening, like as the ripples from a stone thrown in the water" (Stoker 190).

While Stoker makes Dracula's contagious nature explicit, the link between his infectiousness and pollution is not as readily apparent. Stoker does compare the Count to smoke on several occasions. In describing Dracula's stench as "deathly" and "sickly," for example, he uses language evocative of the oppressive smog through which the Count later moves (50). Moreover, when Dracula is purportedly vanquished by Quincy Morris's bowie knife, his "whole body crumble[s] into dust" and dissolves into the air (Stoker 325). Ultimately, however, Stoker's representation of Dracula as a mutable phenomenon that resists rational categorization most strongly associates the Count with fin-de-siècle

notions of pollution. Like smoke to the late-Victorians, the Count becomes a kind of fertile blank spot that refuses any stable connotation. As Michael J. Dennison suggests in *Vampirism: Literary Tropes of Decadence and Entropy*, the Count is a "personification of a cosmos of disorder," a "propagator of multiplicity" whose very existence transcends physical, national, sexual, and thematic boundaries (84). Whether a reanimated corpse, a rat, a wolf, or a nightmarish creature crawling "down the castle wall . . . *face down* with his cloak spreading out around him like great wings," Dracula is undoubtedly physically mutable (Stoker 39). His ethnic multivalence, in turn, is apparent as early as the Count's first encounter with Harker, when he describes himself as an equal-opportunity consumer who has imbibed the "blood of many brave races" (Stoker 33). The Szekelys, he tells Jonathan, "have a right to be proud" because they spring from the "the whirlpool of European" ethnicities (Stoker 33). At once Romanian and English, Szekely and Westenra, Dracula is an unstable phenomenon whose identity changes with each new victim.

Dracula effectively resists interpretation on ethnic and racial grounds, a volatility Stoker recapitulates in his treatment of sexual and gender categories in the novel (Malchow 149). Conscious of the emerging Victorian interest for homosexual gothic, for example, the author toys with his readers by simultaneously inscribing and effacing hints of the Count's homosexual proclivities. The leader of a small harem of female concubines, Dracula nonetheless exhibits a vaguely amorous interest in his male guest by passionately insisting that Jonathan "belongs" to him alone (Stoker 43). It would be misleading, however, to suggest that this ambiguity makes Dracula bisexual. Where the novel "overcodes sexuality at the level of performance," it consistently and emphatically

"undercodes it at the level of utterance" (Auerbach 67). While Polidori actively thematizes the attraction between Aubrey and Ruthven, and Carmilla remains "one of the few self-accepting homosexuals" in Victorian literature, Stoker endlessly defers the question of Dracula's sexuality, making it yet another locus of ambiguity (Auerbach 41). A patriarch to his coven, he seems equally comfortable in the maternal role when he forces Mina "face down" onto "his bosom" as one would "a kitten's nose into a saucer of milk" (Stoker 247).

Refusing to inscribe Dracula into any one interpretation, Stoker invites an abundance of critical readings only to have each destabilize the other. The Count embodies ethnic, sexual, and even thematic mutability. Equally compelling when read as a physical, racial, or sexual menace, Dracula cannot be adequately explained by any of the multitude of critical interpretations that attempt to pin him down. Dracula's pursuers—or intra-textual readers—encounter the same problem as they struggle to understand their adversary. This struggle is palpable on the level of narrative. As Judith Halberstam persuasively argues in *Skin Shows*, "*Dracula* the text, like Dracula the monster, is multivalenced" and as such generates "myriad interpretative narratives" (90). A "veritable writing machine constructed out of diaries, letters, newspaper clippings, and medical case notes," the novel is itself a collage of different voices and concerns (Halberstam 90). In choosing to frame his vampire through the lens of so many distinct and at times contradictory perspectives, Stoker not only undermines the possibility of arriving at any stable definition of the vampire, but also suggests that the very attempt to interpret Dracula is inescapably naive. The vampire hunters' obsessive reliance on textuality is itself a testament to its futility, as no single narrator can effectively describe

Dracula. Jonathan's journal is regularly superseded by Seward's diary, which too needs to be periodically augmented by the descriptive efforts of Mina and Van Helsing. Rather than circumscribe the Count through language, each text generates another, perpetually deferring the possibility of interpretive closure.

The vampire hunters' own efforts to categorize Dracula prove equally futile. These attempts are guided and ultimately limited by Van Helsing's prior familiarity with folklore passed "down from the pagan world of old" (Stoker 124). A repository of unsubstantiated knowledge about various supernatural creatures—among them a "great spider [that] lived for centuries in the tower of the old Spanish church" and "bats that come out at night and open the veins of cattle and horses and suck dry their veins"—Van Helsing naively and somewhat prematurely diagnoses Dracula as a vampire according to a rubric of monstrosity gleaned from tales with which he is already familiar (Stoker 171). Describing the Count and his progeny as "the Un-Dead," he sets forth discrete Holmesian rules according to which their behavior may be predicted. According to Van Helsing, vampires "shun" certain items, including garlic, crucifixes, and the communion host (Stoker 186-87). They are to be feared only after sundown, "for at sundown the Un-Dead can move," and anyone wishing to destroy a vampire need only "cut off [its] head and take out [its] heart" (Stoker 149, 186).

Much like critical attempts to reduce Dracula to a single stable meaning, the vampire hunters' belief that the Count can be categorized through adherence to these discrete rules ultimately proves untenable. The neat one-to-one equation that Van Helsing sets up between a vampire and the means of accomplishing its destruction buckles almost immediately. The rule concerning the proper disposal of corpses, for example, is applied

haphazardly: we see Lucy's decapitation, but not Dracula's. The Count's death, in turn, is accomplished with far less effort. His eyes focused on "the sinking sun," Dracula dissolves "into dust" at the precise instant of Quincy's assault (Stoker 325). Staging this transformation from vampire to dust at so liminal a moment, Stoker echoes the Count's mutability with his material fluidity and in so doing suggests that Dracula may have escaped after all. But although his fate remains unsettlingly ambiguous, the vampire hunters immediately and somewhat naively interpret the Count's "dissolution" as "final" (Stoker 325). Even Van Helsing, who had been so insistent on brutally removing "the head of dead Miss Lucy," seems blissfully unaware of the oversight (Stoker 184). Able to "crumble" into dust as readily as he once transformed into a wolf, Dracula may very well have eluded his attackers, a possibility that undermines Mina's narrative insistence on closure to such an extent as to invite Jonathan's comforting postscript (Stoker 325). He, too, struggles to inscribe a static finality where none exists, going so far as to transform his son into a reassuring symbol whose "bundle of names links [the] little band of men together" (Stoker 326). In this final attempt to dispel the threat of Dracula's mutability, Harker excludes the Count from his narrative of the boy's paternity. But this attempt, like those that precede it, ultimately fails, as the child has already inherited a fair amount of Dracula's blood through Mina.

Illustrating the futility of the vampire hunters' strategy of vanquishing Dracula by inscribing him into a framework of discrete rules about vampirism, Stoker refrains from offering his own readers an alterative interpretive solution. In crafting his novel around the vampire hunters' misguided attempts to categorize Dracula, Stoker forecloses the possibility that an omniscient narrator might succeed where Van Helsing and his

companions fail. Indeed, the intra-textual framework that Van Helsing offers for making sense of the phenomenon of Dracula is ultimately the only one offered by Stoker. Propagating the same methodology of misreading as that embraced by his protagonists, Stoker creates a vampire who perpetually resists categorization both within and without the novel he inhabits. Thus, as Halberstam points out, the characters' "attempts to consume Dracula . . . within one interpretive model inevitably produce vampirism," reproducing "the very model they claim to have discovered" in Stoker's audience (88).

Dracula is as invested in exploring late-Victorian misreading as it is preoccupied with its characters' misguided interpretive efforts. Struggling to impose preexisting rules onto the new phenomenon of Dracula, Stoker's vampire hunters attempt to define the Count through reductive acts of inscription. What they inscribe onto the blank clue of Dracula are, inevitably, their own preexisting anxieties. The vampire hunters' preoccupation with the pollution of blood, for example, becomes the Count's central attribute. Stoker makes it clear that his characters' fascination with blood exchange is not a reaction to Dracula's appetites by establishing it as a locus of sustained inquiry well before his arrival in England. After all, it is the vampire hunters, and not the Count, who participate in the first extended scene of blood sharing in the novel, Lucy's transfusion prefiguring Dracula's later assault on Mina. Even more tellingly, in what is an otherwise extraneous plot point, Van Helsing reminds Seward of "that time"—presumably years before the start of the novel—when the younger man sucked from his "wound so swiftly the poison of the gangrene" (Stoker 106).

Predicated as it is upon the assertion of finite and stable relationships between novel clues and their meanings, the vampire hunters' interpretive strategy privileges

stasis over process as it seeks to ascribe one definitive meaning to what is at its core an infinitely mutable phenomenon. Refusing to offer an alternative to his protagonists' flawed methodology, Stoker compels his audience to assume it by default, allowing the novel to replicate in its readers the interpretive strategy it exposes as inadequate through its characters. This representation of Dracula as a mutable phenomenon that resists rational categorization both within and without the text he inhabits makes him an especially compelling analogy for late-Victorian anxieties about pollution. Like smoke, Dracula makes his intra-textual victims mobile vectors of contagion. Stoker then has those victims infect his readers with an interpretive strategy that ultimately proves futile: bad readers within the text create bad readers beyond it. While Doyle abandons accuracy in order to preserve the illusion that Holmesian logic can make sense of pollution, and Shiel abruptly concludes his narrative so as to prompt readers to reconsider their reliance on that methodology, Stoker takes the novel approach of characterizing Holmesian logic itself as a transmissible contaminant.

AFTERWORD

"Could we continue to live? That was the question which I had begun to ask myself. . . . How would the end come? Would it be from a return of the poison? Or would the earth be uninhabitable from the mephitic products of universal decay?" (Doyle, *The Poison Belt*, 232-33)

Forty years after Doyle contemplated mass annihilation in *The Poison Belt*, the toxic cloud he imagined finally descended on London. On Friday, December 5, 1952, a combination of low temperatures, windless conditions, and an anticyclone in the Atlantic trapped a thick layer of coal smoke in the lower troposphere. Unable to percolate through the cold air, smoky fumes from the capital's many chimneys fell back to the ground. Within a day, visibility dropped to five yards throughout the city. That Sunday, it was officially described as "nil" (Lean 1). The effects were as pronounced indoors: a performance of *La Traviata* at Sadler's Wells Theater was canceled because the audience could not see the stage, while nurses at the Royal London Hospital complained that they could barely recognize their patients. By the time the air cleared on Tuesday, over four thousand people had lost their lives. During the following two months, another seven thousand would perish of respiratory illnesses (Fuller 1).

The disaster, quite accurately described as the Great Smog of London, was arguably the most instrumental factor leading to the passage of the Clean Air Act in 1956, which sought to ameliorate the pollution problem by introducing a number of practical measures to reduce smoke. The most controversial of these was the designation of so-called "smoke control areas" in certain cities and larger towns. Such areas—many of which have retained the designation to this day—were subject to new regulations permitting the use of only smokeless and semi-smokeless fuels. The legislation simultaneously incentivized the domestic use of gas, electricity, and cleaner varieties of

coal, gradually shifting the nation's energy consumption toward sources that would emit less sulfur dioxide into the atmosphere. Other provisions relocated power stations away from the cities and into rural areas, while others increased the height of industrial chimney stacks, a measure that was further strengthened by the Clean Air Act of 1968.

While hardly an unqualified success, the legislation was decidedly effective: between 1960 and 1994, ground level concentrations of sulfur dioxide fell by more than seventy percent, and annual average concentrations of atmospheric smoke declined by eighty percent throughout the 1970s and 1980s (Giussani 4). But while the question of why the Clean Air Act of 1956 and its progeny succeeded in turning the tide of England's smoke crisis is intriguing, the question of why it succeeded where earlier legislative efforts had failed may prove even more instructive.

As disturbing as the phenomenon was to those trapped in its midst, the Great Smog was hardly England's first indication that airborne pollutants were dangerous. As I discussed in the first and fourth chapters, the Victorians were both perfectly aware of the problem and perfectly willing to resolve it through legislative means. Indeed, the Clean Air Acts of the twentieth century were structurally and rhetorically similar, if not altogether analogous, to provisions drafted during the fin-de-siècle. The question of why certain pollution measures fail while others succeed is not merely academic: as Gary Fuller points out, even as the widespread availability of natural gas and the migration of industrial works out of London has noticeably improved air quality in the capital, emissions related to the burning of solid fuels have been replaced by new urban pollutants, including those from diesel traffic (Fuller 1). Fifty years after the Great Smog, Richard Mills, then secretary general of England's oldest environmental action group,

Environmental Protection UK, noted that while modern-day Londoners were appreciably better off than their grandfathers, they were "not as much better off as [they] might have thought" (qtd. in "Historic smog"). Mills pointed out that "invisible pollutants [were] still taking a major toll on health" as "[s]ome 20,000 in England alone suffered shortened lives each year" due to airborne toxins (qtd. in "Historic smog"). By 2012, air pollutants were estimated to have caused approximately 4,300 deaths in London alone, a figure reminiscent of the number who died during the Great Smog (Fuller 1).

The comparison should not be overstated; the four thousand casualties of the Great Smoke were incurred in a matter of days, not months. Modern pollutants do, however, represent as much of a health burden to modern Londoners as those of the 1950s did to their ancestors. Environmental Protection UK has explicitly analogized the coal smoke problem of generations past to current concerns about climate change, pointedly warning British lawmakers that "the aftermath of the great smog [teaches] that you cannot just assume that because you cannot see the pollution that it is not there" (qtd. in "Historic smog").

Environmentalists are not the only ones who seek to draw instructive parallels between current and past ecological challenges. The emergence of ecocriticism as a viable if somewhat amorphous critical discourse during the mid-1990s can be broadly understood as an attempt to simultaneously describe and prescribe reactions to global warming, often by reference to texts about past environmental crises. I have thus far avoided a discussion of ecocriticism because while my project shares some of its concerns, it is less invested in ecocriticism's central preoccupation with environmental justice, or the fair distribution of environmental benefits and burdens.

Lawrence Buell, whose study of *The Environmental Imagination* is considered by many to be the foundational text of ecocriticism, defined the discipline as the "study of the relationship between literature and the environment conducted in a spirit of commitment to environmentalist praxis" (Buell 430). Simon Estok has since made Buell's emphasis on ethics more explicit, noting that "ecocriticism has distinguished itself . . . by the ethical stand it takes, its commitment to the natural world as an important thing rather than simply as an object of thematic study" ("Report Card on Ecocriticism" 220). According to Estok, ecocriticism is "any theory that is committed to effecting change by analyzing the function–thematic, artistic, social, historical, ideological, theoretical, or otherwise–of the natural environment, or aspects of it, represented in documents (literary or other) that contribute to material practices in material worlds" ("Shakespeare and Ecocriticism" 16-17).

But ecocriticism's focus on environmental justice may prove to be a two-edged sword. The question is not whether a discourse directed toward environmental justice (or indeed environmental justice itself) is desirable, but whether environmental crises should be narrated—be it descriptively or proscriptively—only through the prism of fairness. As I have argued, the late Victorians' perception of smoke as a proxy for anxieties that at their root had little to do with pollution not only overwhelmed any objective appreciation of airborne toxins, but also ultimately shaped legal and literary treatments of pollutants during the period. While this emotionally fraught approach to smoke arguably contributed to the popularity of late-Victorian detective and Gothic fiction, it also wed legislators to the inadequacies of tort law at a time when more practical solutions to liability allocation were being considered in less moralistic contexts, like workmen's injury. The study of

attitudes toward smoke during the fin de siècle suggests that the use of narrative about environmental crisis as primarily a staging ground for resolving broader social anxieties—be they fears about entropic degeneracy in the late nineteenth century or concerns about fairness and social justice during the twentieth and twenty-first—may obscure solutions that could accomplish as much in practical effect as they lack in moral import.

The question remains: how did the Great Smog—which gave rise to apocalyptic narratives implicating a host of 1950s concerns—simultaneously prompt the passage of England's first successful smoke abatement legislation? While the phenomenon itself did not immediately prompt mass hysteria among Londoners who were already accustomed to prolonged fogs, accounts of the Great Smog during subsequent months rivaled the most alarmist Victorian descriptions of the smoke nuisance. But unlike their grandfathers, the legislators responsible for the passage of the Clean Air Act of 1956 sought to address real smoke rather than an imagined pandemonium. While, focused as it is on ethics, ecocriticism may not be in a position to explore such questions, a comparison of attitudes toward pollution during the fin de siècle and the 1950s would prove uniquely instructive to the environmentalist project, and especially so as it seeks to navigate current political narratives about climate change.

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