

THE MALTHUSIAN PARADOX: WEAPONS RHETORIC BEFORE THE BOMB

BY

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DISSERTATION

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Abstract

The Malthusian Paradox: Weapons Rhetoric Before the Bomb is a longitudinal case study of weapons rhetoric leading up to WWII. It examines how influential weapons rhetors negotiated a technological conundrum that I call the “Malthusian Paradox.” The Malthusian Paradox is the commonplace belief that while technology will destroy humanity, technology also provides humanity’s only means of preservation. The Malthusian Paradox not only clarifies what Thomas R. Malthus thought about populations and political economy at the end of the 18th century in London, but it also clarifies an enduring pattern of deliberation about technology’s effects on overpopulation, globalization, and war. This scheme of ideas began to inform how rhetors navigated weapons discourse, and in turn, the proliferation of the Paradox in weapons rhetoric reiterated and re-inscribed the concept such that it has acquired an aura of permanence, immutability, and inescapability. The Malthusian Paradox thus refers not just to a person, but also to the conundrum he presented to modern society, the manner of thought it germinated, and a persistent technology rhetoric – all of which have a continuing history. Thereby, the Paradox has become a foundational figurative and argumentative principle of technology.

I argue that the Malthusian Paradox can be construed as a gauge to compare and assess the strategies and tactics of weapons rhetors communicating in discrete historical contexts across time. I therefore implement a longitudinal case study that combines close textual analyses of specific documents with historical analyses of how weapons and their compatible technological logics developed. I suggest that analyzing how weapons rhetors negotiate the Malthusian Paradox grants insight into how people have invented the current technological conditions, understand war, formulate ideologies, and get anxious about weapons. The case studies examine Malthus’s *Essay on the Principle of Population* (1798), accused Haymarket bomb conspirator August Spies’s courtroom address (1886), Amos A. Fries’s and Clarence J. West’s army textbook *Chemical Warfare* (1921), and selected correspondence and Manhattan Project memos of nuclear physicist Leo Szilard. As rhetoric and the Paradox smashed into each other over the historical development of weapons, certain overriding strategies have emerged, demonstrating that many of the rhetorical tactics and strategies associated with the Bomb and modern-day terrorism have much older origins. These overriding strategies function as windows into what might be thought of as the dominant network of weapons discourse that help to constitute their political and ideological presence in the world, and bring populations “before the Bomb.”

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Chapter 1

Paradox and Weapons Rhetoric

“The good craftsmen seemed to me to go wrong as much as the poets: because they practiced their *technai* well, both thought themselves wise in other, most important things, and this error of theirs obscured the wisdom they had.” —Socrates¹

At about 9 o'clock in the morning of April 19, 1995, a truck bomb ripped into the Alfred P. Murrah Federal Building in Oklahoma City. The explosion traveled at 7,000 mph and its force of 74,000 pounds equaled the force of a magnitude 4 earthquake.² The primary explosive agent, ammonium nitrate fertilizer, decimated the entire building's façade. The bombers, Timothy McVeigh and Terry Nichols, constructed the bomb by loading 108 fifty-pound bags of the fertilizer, three 500-pound drums of nitromethane fuel, and some ammonium nitrate/diesel fuel oil (ANFO) explosives into a rental truck.³ They killed 168 and injured 680. The surprise attack, which came in response to the U.S. government's 1993 raid of the Branch Davidian compound outside Waco, TX became, in an instant, a shocking reminder of the dual uses of synthetic fertilizer. The bombers did not so much convert fertilizer into a weapon as they did implement one of ammonium nitrate's primary uses – causing massive explosions.

German chemist Fritz Haber, who in 1918 won the Nobel Prize in Chemistry, began researching how to make nitrogen fertilizers in the early 20th century to help agriculture. Haber said of his discovery that “improved nitrogen fertilization of the soil brings new nutritive riches to mankind” to the extent that “the chemical industry comes to the aid of the farmer who, in the good earth, changes stones into bread.”⁴ In 1911, the technology to mass produce ammonium

nitrate must have seemed to Haber like an unequivocal boon for humanity. However, once WWI broke out, Haber applied his ingenuity to not only feeding a hungry wartime population but also exploding the enemy. By inventing an industrial process that combine nitrogen and hydrogen to create ammonia, he helped accomplish both feats. The “Haber Process,” later refined by Carl Bosch, supplied Germany with a significant portion of the ammonium nitrate it needed to arm itself for four years of catastrophic warfare. Moreover, Haber’s chemical acumen prepared him to oversee the first successful German chemical warfare attack with chlorine at Ypres, April 22, 1915. In 1916 he became the director of Germany’s Chemical Warfare Service and his Leunewerke, a vast chemical factory complex, provided Germany with munitions and fertilizer as the primary producer of each.⁵ Thus, the same chemist whose technology empowered a massive increase in agricultural production in the 20th century also empowered the widespread development of military explosives, the German push to inaugurate chemical warfare, and ensuing international arms races. The huge expenditures on German chemical plants, especially to produce “dual use” nitrates, propelled the expansion of the military-agricultural technology.⁶ And in 1995 ammonium nitrate both exploded Oklahoma City’s Murrah Building and nourished the monoculture of Oklahoma’s cash crop – wheat. It nurtured, and then it destroyed. It continues to do both.⁷

The history of nitrate fertilizer demonstrates how technology places limits upon political agency and how political agency can become reinvented with technological innovation. Haber, well-situated in the German military command, helped to facilitate one of the bloodiest wars of all time and pushed Europe to the brink of collapse. McVeigh and Nichols, in contrast, blew up a lone bomb. Confronted with the overwhelming military force of the U.S., McVeigh’s and Nichols’s truck bomb could not destroy the government they despised. The death and destruction

they perpetrated in Oklahoma City may remain a potent symbol to a harried paramilitary American subculture, but despite its explosive success, for everyone else, the attack symbolizes the depravity of terrorist tactics and implicit support of governmental anti-terror operations. McVeigh and Nichols exploded the most powerful bomb they could construct with objects ready at hand, and by doing so indicated the impossibility of attaining their political goals. In the 20th century, both states and revolutionaries possessed the same weapon. In WWI ammonium nitrate helped to determine whether or not belligerent states could preserve themselves amidst “world war.” But for the terrorists McVeigh and Nichols, the truck bomb represented the maximum limit of their revolutionary political agency.

Yet, the ingenuity of the bomb itself—the appropriation of commonplace industrial products—has not resulted in the weapon’s vilification, in contrast to, for example, the calumination of hydrogen bombs. To disparage the mass production of ammonium nitrate, nitromethane, and rental trucks would be to disparage three of the fundamental bases of the U.S. economy—agriculture, chemistry, and transportation. To bar the products of German war technology from common use would threaten large populations with starvation.⁸ So, should people live in fear of fertilizer, or use it as definitive proof that humanity can invent technology to sustain itself? Not only fertilizer, but all technologies confront people with this dilemma, requiring assessments of their advantages and disadvantages.

I call the extreme version of this technological conundrum the “Malthusian Paradox.” The Malthusian Paradox is the commonplace belief that while technology will destroy humanity, technology also provides humanity’s only means of preservation. According to the British political economist Reverend Thomas Robert Malthus, technology serves us by sustaining a growing population. However, technology sustains humanity so well that a global population

crisis will explode, a crisis exacerbated by a merciless war for resources. So, technology serves us until it kills us, and only what kills us can save us.⁹ As an ideology, the Paradox perpetuates the innovation, production, and deployment of dangerous technologies for the purposes of securing humanity from famine, plague, and war. As an anxiety, the Paradox presents the world's population with the permanent threat of catastrophe, even annihilation. As a rhetoric, the Paradox constrains and opens up the inventive scope of how people communicate about technology.¹⁰

Rhetorical scholars have long been concerned about the successes and failures of nuclear advocacy and dissent throughout the Cold War, as well as the proliferation of more recent weapons systems, such as missile defenses and biological weapons.¹¹ But, little rhetorical attention has been given to pre-WWII weapons discourse, much less the Malthusian Paradox. I suggest that examining how rhetors negotiated the Paradox provides further insight into the rhetorical norms of weapons discourse that post-Hiroshima rhetorical scholarship has taken up, such as “nukespeak,” “strategic deception,” and “bio(in)security.”¹² The value of the Paradox to rhetorical scholarship thus derives from its role as a concept that facilitates and constrains rhetorical invention across the historical and future trajectories of war and violence. In short, analysis of the Paradox shows how it can be construed as a gauge to compare and assess the strategies and tactics of weapons rhetors communicating in discrete historical contexts across time. In this way, I aim to develop historical case studies of the Malthusian Paradox in order to both buttress rhetorical scholarship about post-WWII weapons and re-imagine how to understand and critique the ongoing endeavors of weapons advocates and dissenters.

The Malthusian Paradox not only clarifies a particular person's thoughts about populations and political economy at the end of the 18th century in London, but it also clarifies

an enduring pattern of deliberation about technology's effects on overpopulation, globalization, and war. This scheme of ideas began to inform how rhetors navigated weapons discourse, and in turn, the proliferation of the Paradox in weapons rhetoric reiterated and re-inscribed the concept such that it has acquired an aura of permanence, immutability, and inescapability. The Malthusian Paradox refers to not just a man, but also the conundrum he presented to modern society, the manner of thought it germinated, and a persistent technology rhetoric – all of which have a continuing history. Once technology became conceived as fraught with both benefits and dangers, the Paradox came to take a central role in any rigorous attempt to address how people use machines. Thereby, the Paradox has become a foundational figurative and argumentative principle of technology. Philosophies and histories of technology, interpretations of modernity, culture, society, civilization, industry, economics, and politics all must address the Paradox. For these reasons, I use Malthus's iteration of the Paradox as the conceptual frame to begin examining weapons rhetorics.

Malthus did not originate the Paradox; it has influenced humanity's conception of technology since at least ancient Greece and has a "complex rhetorical ancestry."¹³ Protagoras's cosmogony, as reproduced by Plato, demonstrates technology has long made humanity think about its preservation and destruction at the same moment by tying human survival to technological achievement. Protagoras depicted both how weapons fail to assure survival and how technology, in the form of political organization and law, could assure survival. The sophist recounted how people "were devoured by wild beasts, since they were in every respect the weaker, and their technical skill, though a sufficient aid to their nurture, did not extend to making war on the beasts, for they had not the art of politics, of which the art of war is a part."¹⁴ Even when gathered together for protection, early humans would kill each other, which made Zeus

fear “the total destruction of our race.”¹⁵ The fate of Protagoras’s human world seemed to rest on its technological capacity to either preserve itself or cause its own demise by failing to withstand war and nature. Ancient technology did not guarantee survival. Neither did it produce self-extermination, but the concept that the innovation of technologies could empower one population to exterminate another or preserve itself in the face of annihilation became a norm of technology discourse.

This ancient problem filtered into the 20th century’s “technological society,” according to Jacques Ellul. His essay, “The Technological Order,” proposed four technological rules that reiterate the Paradox:

1. All technical progress exacts a price;
2. Technique raises more problems than it solves;
3. Pernicious effects are inseparable from favorable effects; and
4. Every technique implies unforeseeable effects.¹⁶

Ellul further asserted that, “It cannot be maintained that technical progress is in itself either good or bad. In the evolution of Technique, contradictory elements are indissolubly connected.”¹⁷ As much as any machine comprises part of the vast system of technology that infuses human activity, it cannot claim to be a pure boon or detriment to everyone. Some technologies comprise a greater threat, of course, so their “pernicious and favorable effects” confront humanity with larger speculative impacts on the world.

In another recent reiteration of the Paradox that somewhat resembles the pervasiveness of Ellul’s four rules, sociologist Ulrich Beck’s “risk society” manages the uncertainty that accompanies dangerous technologies. According to Beck, “modern” humans face a high probability that they will exterminate their own species with chemical, nuclear, genetic, and ecological technologies.¹⁸ Although industrialization spurred the development of beneficial technologies that, in a type of circular reasoning, then legitimated their invention, those once-

beneficial technological projects now confront humanity with disaster. Beck therefore contended that the risk society with its myriad problems must use “risk logic” to distinguish “between risks and threats” in order to organize politics and formulate policy.¹⁹ Risk analysis, which delineates the positive and negative trade-offs caused by technology, re-inscribes the tension between preservation and destruction for both local communities and the entire earth depending on the risk and threat level ascertained during technology policy debates. With destruction looming everywhere, Beck argued that savvy technological political design could stave off disaster if the dilemma gets solved. But, it never does. Thus, the Malthusian Paradox appears on many levels of technology rhetoric.

Despite these ancient origins and current permutations, I dub this paradox “Malthusian” because Malthus confronted it at a critical moment that witnessed the brutal subordination of huge masses of people to machines in the factory and liquidation on the battlefield. Malthus provides a rich cultural and conceptual approach to technology: he rejected technological utopias, condensed earlier anxieties about the extinction of civilizations with their own technologies, and anticipated late 19th and early 20th century anxieties about human extinction with the new weapons born out of industrialization. In short, Malthus’s importance to an evaluation of the Paradox as it relates to weaponry derives from his implication that the survival of the entire human species is at stake during global warfare. Malthus concerned himself with the technological fate of large populations, and this study aims to do likewise, which makes Malthus both a compelling starting point and Malthusianism a compelling conceptual frame.

I suggest that of countless dangerous technologies weapons best exemplify the Paradox. Weapons are the technologies that tend to have the greatest direct impact on whether or not a particular society gets preserved or annihilated, both during wartime and during peacetime

through deterrence. And, peace always degenerates into war. War perhaps best exemplifies that destruction begets creation and creation begets destruction. In one of his earliest writings, political philosopher Michael Bakunin invoked the “spirit of revolution” to depict the perpetual movement back and forth between war and peace. He wrote, “Let us therefore trust the eternal Spirit which destroys and annihilates only because it is the unfathomable and eternally creative source of all life. The passion for destruction is a creative passion, too.”²⁰ And, according to Hannah Arendt, the goal of well-reasoned violent action is peace through victory, and this peace justifies the use of violence and its rationalization in the first place. This circling of reason and violence around each other serves to “dramatize” conflict.²¹ To state that peace and violence comprise the basic poles of warfare oversimplifies one of the most complex and over-determined human activities, but the interplay of creation, destruction, and preservation cannot be ignored when analyzing the tools of war.²² The Paradox perseveres from ancient to contemporary warfare, and it pervades weapons discourse. It adds a technological layer to the already vexed strategic and moral aspects of weapons production that makes debating and deliberating weapons and war such a complicated task. When rhetors advocate or resist a given weapon, they tend to negotiate the paradoxical conundrum that confronts them all. Their language butts up against it at each inventive turn whether they acknowledge the Paradox or not.

Weapons rhetoric grants particular insight into the Paradox as the magnitude of death and destruction caused by military technology increases. The stakes – revolution, civilization, perpetual peace, and extermination – are higher with weapons than they are for other devices. As Lewis Mumford wrote, “Real orgies of destruction, vast collective eruptions of hate, became possible only when civilization provided the technical means of accomplishing them.”²³ The fate of larger and larger populations relies on weapons, and part of this reliance involves how people

communicate about weapons as they get deployed in rhetoric as well as on battlefields. Technology does not kill alone. Language is violent and language motivates violence. For French philosopher Paul Virilio, violence is inherent in communication, and the “information bomb,” or “weapon of mass communication,” is not a mere metaphor.²⁴ Rather, a “weapon of mass destruction is subject to the weapon of a form of mass communication that overrides it in every way – the audiovisual impact (in real time) outstripping by a long shot, through its globe-spanning propagation velocity, the material impact, precisely targeted, of precision-guided explosive missiles.”²⁵ Rhetoric facilitated the 20th century’s magnitude of killing in innumerable ways by persuading people to take up arms or creating the political conditions in which people were forced to take up arms—through the ideological construction of political economies, religious dogmatism, patriotism, nationalism, and hatred; through military strategists, commanders, and drill sergeants; through politicians, policy, technocracy, and diplomacy; through the mass media; through burgeoning weapons industries and capitalist expansion; through the militarization of science, engineering, and universities; and through the marketing and selling of weapons to individuals and states on a global scale. As rhetoric and weapons justified and resisted each other, some weapons became symbolic, and such symbols influenced the appearance of new weapons and the rhetoric used to depict them. Weapons and words circled around each other throughout all of these activities, professions, and concepts, and at each deliberative moment, people wondered about whether weapons would cause humanity’s extinction or its ultimate preservation. To speak or write about weapons has required imagining how rhetoric helps to spur people towards peace or extermination.

I argue that analyzing how weapons rhetors negotiate the Malthusian Paradox grants insight into how people have invented the current technological conditions, understand war,

formulate ideologies, and get anxious about weapons. Each of the following case studies details how advocates of weapons—whether dynamite bombs, mustard gas, or the atomic bomb—expressed the Paradox and how they rhetorically negotiated it. As rhetoric and the Paradox smashed into each other over the historical development of weapons, certain overriding strategies have emerged, demonstrating that many of the rhetorical tactics and strategies associated with the Bomb and modern-day terrorism have much older origins. These overriding strategies function as windows into what might be thought of as the dominant network of discourse about weapons of mass destruction that help to constitute their political and ideological presence in the world, and bring populations “before the Bomb.”

The following section describes the conceptual organization of the ensuing chapters and my method of rhetorical analysis. Then, I preview the case studies that examine Malthus’s “principle of population” (1798), accused Haymarket bomb “conspirator” August Spies’s courtroom address (1886), Amos A. Fries’s and Clarence J. West’s army textbook *Chemical Warfare* (1921), and selected correspondence of nuclear physicist Leo Szilard in the years leading up to and following the bombings of Hiroshima and Nagasaki. I conclude by arguing for the importance of this research.

Analytical Method and Argumentative Organization

To show the Paradox’s ongoing influence on weapons rhetoric, I examine important documents that appeared at specific technological moments during a historical period that begins with the confluence of new large-scale warfare and theories of overpopulation in the late 18th and early 19th centuries and ends with the successful testing of nuclear weapons in the midst of WWII. Because sometimes many decades elapsed between the appearances of these documents,

I use a type of rhetorical analysis that John Angus Campbell dubbed a “longitudinal case study.” In the remainder of this section, I explain Campbell’s method and how it fits this project. Second, I explain how the case study chapters are organized to take advantage of this method. Then, I explain how the texts and rhetors I examine fit within the framework of the longitudinal case study.

According to Campbell, a longitudinal case study studies the “kairotic occurrences” that “become self-constitutive chapters in the anthology of meaning we call history.”²⁶ Campbell conceived that juxtaposing and combining Michael Leff’s discrete close textual analysis with Michael Calvin McGee’s ideographic analysis provides a way to connect analyses of chronologically disparate texts to create an overarching historical claim. According to Campbell, a close textual analysis unfolds “in a specific situation and discloses its meaning within textual time,” and an ideographic analysis unfolds and gathers “meaning over centuries,” so that a synthesis of the two methods creates a “House of the Middle Way.”²⁷ Whereas McGee’s method considers the “rhetorical artifact as but a partial expression of a larger cultural whole,” because “it reminds us that invention is grounded in history and history is a matrix of possibilities,” Leff’s method focuses on “the local stability of the text” in question.²⁸ Campbell concluded that the “house of the middle way” shows that “meanings . . . tend to stabilize along specific rhetorical-cultural axes.” In turn, “we come to understand the rhetorical meaning in larger historical-interpretive patterns.”²⁹

My research has a similar goal – to understand how the current relationship between humanity and weapons became rhetorically and technologically constituted in a span of approximately 150 years by performing close textual analyses of specific rhetorical artifacts. Each instance of weapons rhetoric that I examine took up popular attitudes and arguments about

dangerous technologies, reinvented them, and radiated the updated versions outward to influence further innovation. I therefore concur with Campbell's assertion that in a longitudinal case study, "Each construction absorbs the meanings of its context and bodies those meanings forth in a local explosion of rhetorical energy."³⁰ Such "local explosions" indicate both the enduring influence of the Paradox on technology rhetoric and the sometimes stable and sometimes changing historical trajectory of weapons rhetoric. To paraphrase Campbell, my project offers an account of how specific weapons and weapons advocates created rhetorical situations as they moved across time, and how weapons rhetoric radiated into the present from key discursive epicenters.³¹

John Durham Peters's *Speaking into the Air*, provides a recent example of scholarship that performs a longitudinal case study.³² The book locates important and formative instances of modern communication in specific texts in a "conscious anachronism."³³ Peters traced the idea of communication from ancient Greece through the Bible, German philosophy, radio technology, and attempted contact with aliens. To justify his method, Peters cited Walter Benjamin, who, rather than conceiving of history as linear and progressive, suggested that historical materialists should "blast open the continuum of history," and leave "it to others to be drained by the whore called 'Once upon a time' in historicism's bordello."³⁴ Instead of perceiving people and events as emerging from straight lines, Benjamin argued that historical materialists should perceive moments and lives as merging constellations. He wrote:

Historicism contents itself with establishing a causal connection between various moments in history. But no fact that is a cause is for that very reason historical. It became historical posthumously, as it were, through events that may be separated from it by thousands of years. A historian who takes this as his point of departure stops telling the sequence of events like the beads of a rosary. Instead, he grasps the constellation which his own era has formed with a definite earlier one.³⁵

To perform this critical approach, the historical progression from chapter to chapter in Peters's *Speaking into the Air* is nominally linear, but also chronologically disrupted and dispersed such that the meaning of "communication" derives from a comingling of Plato, Jesus, and the SETI program. I use a longitudinal case study in a similar fashion, to also agree with technology scholar Carl Mitcham's assertion that "The history of technology is not nearly so linear and progressive as technological history implies."³⁶ I suggest that the Malthusian Paradox can best be understood as a disrupted and dispersed idea that amalgamates the ideologies, anxieties, and rhetorics that attend the historical materialization of population management, dynamite bombs, mustard gas, and atomic bombs.

In order to demonstrate the "absorption" and "bodying forth" of weapons rhetoric, I recount both how weapons rhetors grasped backward at rhetorical tactics and strategies to reinvent or redeploy them, and how they came up with new means to better fit new weapons. To do this, I have organized the case study chapters to tell both a synchronic rhetorical account of specific moments in the history of weapons and to tell a diachronic account of weapons rhetoric across time. Each chapter first introduces the topic and rhetor under examination. Second, each chapter explains how each rhetor expressed the Paradox, and considers how each weapon's functions and destructive effects meshed with each iteration of the Paradox. Each of these sections indicates the ideological context that undergirded the plausibility of each weapon's rhetorical and physical deployment. Third, each chapter posits an important element of weapons rhetoric that can be observed across time. Fourth, each chapter performs a textual analysis of each rhetor's vital documents. Each chapter also considers how each iteration of weapons rhetoric radiated outward into several predominant societal, cultural, economic, and technological "logics" that have become some of the central guiding rationales that justify the

current technological and military conditions. Thus, each textual division meshes not only with the other sections in each chapter, but with each section across chapters to point toward an overall longitudinal assessment of weapons rhetoric.

In the case studies that follow, the sections that demonstrate how one rhetor expressed the Paradox in relationship to a specific weapon or technology show how, with Malthus, the primary concern was imagining the fate of large populations as they descended into a global war caused by the cyclical success and failure of agricultural technology; how Spies, in the face of violent state suppression, participated in a common international dynamite discourse; and how Fries and West attempted to reshape public opinion about chemical warfare by defining weaponized gas as the “humane” way to annihilate enemies. Szilard’s confrontation with “deterrence” agglomerated all of these concerns into an ideological anxiety about weapons that helped to undergird foreign policy during the Cold War.

The sections that posit important elements of weapons rhetoric focus on specific characteristics that together constitute an overarching concept of what weapons rhetoric is. In the chapter about Malthus I include an examination of the concept of rhetorical paradox. In the chapter about Spies I describe the basic activity of “bomb talking” that both advocates and detractors used to deliberate weapons. In the chapter about Fries and West, I describe how rhetorical amplification seemed especially apropos in an era characterized by WWI’s destruction and anxiety about chemical warfare. In the chapter that analyzes Szilard’s correspondence, I describe how the philosophy of pragmatic idealism helps to frame a model of communication that well fits the diverted goals of weapons advocates. Thus, weapons rhetoric consists of, in part at least, both a common discourse of bomb talking that possesses a cluster of commonplace

rhetorical tactics and arguments, and the pragmatic means to work toward unattainable ideal goals.

Within each chapter I explore a cluster of powerful “logics” that are embedded within the Paradox, each of which is "paradoxical" in its own right. Logics, such as industrialization, overpopulation, total war, mass production, the democratization of technology, deterrence, escalation, inevitability, and mutual assured destruction became arguments and rhetorical commonplaces that rhetors can draw from to deliberate new technologies because they appear to have an already proven rationale or legitimacy. These logics have supported and energized the normalization of military culture.

The sections that perform close textual analyses examine how each rhetor absorbed, ignored, or invented new tactics and strategies while negotiating the Paradox. Thus, some concepts, logics, arguments, and rhetorical tactics appear and disappear in the analysis in order to constitute a foundation for understanding weapons rhetoric. Statistical proofs, for example, appear as a primary rhetorical means to support both Malthus’s “principle of population” and Fries’s and West’s attempt to prove that chemical weapons are more humane than other weapons. The importance of deterrence likewise fades in and out of the narrative; while deterrence was a supporting logic of chemical warfare, it became a guiding ideological principle of nuclear policy. As the Cold War thawed, deterrence’s importance to foreign policy diminished, yet it remains an important logic for the “war on terrorism.”

I thus choose to examine Malthus, Spies, Fries and West, and Szilard, because they took up, reiterated, and circulated rhetorical tactics and strategies that help to demonstrate the longitudinal trajectory of weapons rhetoric. In addition to presenting novel arguments about novel weapons, they absorbed prior weapons rhetoric, and the logics that developed from them,

and verbalized them for others to absorb and re-circulate. Malthusian overpopulation anxiety thus helps to make sense of the speculative effects of anarchist bomb throwing and the framing of chemical weapons as a type of massive industrial annihilation. The advocacy of chemical warfare during and after WWI established ways to debate weapons that later deliberations about atomic bombs reflected, albeit with a distorted image. These influential rhetors thus contributed to global anxiety about weapons and global faith in their power to save humanity from destruction.

These figures also all had historical, political, and technological aspirations that crashed their activities into the Paradox. Each figure not only desired to make important arguments about weapons for specific political ends, they wanted to entrench their arguments into how society organizes itself. While Malthus wanted to influence the development of British economics and governmental class organization to perpetuate industrial capitalism, Spies desired to martyr himself to spur the extinction of capitalism. And while Fries and West fought to justify chemical warfare as a legitimate way to fight wars and to justify the Chemical Warfare Service as a permanent division of the U.S. Army, Szilard sought to use weapons to construct a world of peace. Thus, all of these figures imagined themselves either implicitly or explicitly as historically important, and their importance hinged upon their success in advocating technology and weapons. In turn, their relative successes and failures indicate how technology constrained and freed their individual capacity to affect political change by limiting the scope of their activities or suggesting new ways to use weapons to motivate people.

Overview of Chapters

In chapter two, I further describe and define the Malthusian Paradox. I argue that Malthus's population theory exemplifies the process of rhetorical invention that centralized the melding of faith in technology as humanity's preservation with anxiety about potential technology-induced annihilation. Multiple historical events, technological innovations, and political movements at the turn of the 18th century make Malthus's population theories an apropos pre-text by which to gauge and explain the Paradox. By "pre-text" I mean both a conceptual frame with which to examine weapons rhetoric, and a kind of living rhetorical frame that helped to animate the production of weapons of mass destruction. Malthus lived as the agricultural and industrial "revolutions" increased humanity's productive capacity to unheard of levels, which led him to wonder about the fate of large populations in relationship to the technological capacity to sustain the increases in productivity that he witnessed. He saw factories proliferate, London's population explode, and Napoleon's armies rage across Europe, events which appeared to make large portions of the global population "redundant." Malthus used several important rhetorical tactics to elucidate his theory that population growth is limited by agricultural ingenuity. First, his use of questionable agricultural and demographic statistics helped to establish his "principle of population" as a natural law by presenting sublime numerical ratios that depicted absurd environmental scenarios well beyond the potential of sustainability. Second, by speculating about the catastrophic results of overpopulation his generalizations abstracted and amplified the magnitude of these results to threaten the entire earth. Third, his use of metaphorical antistasis empowered Malthus to drift between the preservative and destructive tendencies of "machines" without contradicting himself. Not only did these rhetorical tactics undergird the plausibility of his "principle of population," they also indicated how weapons

rhetoric took up concerns about humanity's technological fate. Thus, as a pre-text his writings provide an entry point for understanding how rhetoric impinges upon technology and how technology impinges upon rhetoric.

To begin elaborating the Paradox's influence on the rhetorical manifestation of specific weapons, chapter three examines the "bomb talking" of August Spies. In 1886, dynamite seemed to suffuse the entire city of Chicago. The mass production of dynamite and other bomb-making materials made them available to almost anyone, whether government officials or revolutionaries, threatening random, brutal, and widespread violence. Its ubiquity and the supposed threat to humanity posed by one explosive device characterized public anxiety about terrorism. Spies, the accused arch-conspirator of the infamous Haymarket bombing invoked the Paradox to defend himself at trial and to attack the American political system. In his final address to the court, Spies espoused anarchism, advocated political violence, and made important technological arguments about how revolutionaries could use dynamite to save humanity from capitalism. I argue that Spies capitalized on the instability of "bomb talking" to negotiate the Paradox with three rhetorical tactics. First, he made an elaborate turnaround argument that depicted capitalist destruction as worker preservation and workers' destruction as capitalist preservation. Spies claimed that anarchists wanted to save civilization with dynamite, while the state attempted to annihilate the working masses. The state claimed that Spies wanted to annihilate the American population with dynamite, while the state attempted to save the people. Second, Spies used the polysemous character of the term "dynamite" to serve multiple functions in his revolutionary agitation. When he called workers to arms by invoking dynamite, it was unclear whether or not he intended them to begin spilling blood. Third, Spies cultivated an image of himself as a martyr, and thereby he made a synecdochic generalization about his violent

demise and the unending terror of bomb throwers. As one part of the so-called “anarchist conspiracy” to terrorize civilization with bombs, Spies depicted himself as representative of an entire working population of potential bomb throwers who threatened permanent, random terror. Spies thus used the rhetorical instability of dynamite discourse to provoke political instability.

In chapter four I turn from anarchist dynamite bombs to the proliferation of chemical weapons during WWI and after. I focus on one of the chief officers of the U.S. Army’s Chemical Warfare Service, Major General Amos A. Fries, who wrote a military textbook, *Chemical Warfare*, with Clarence J. West of the National Research Council and the Reserve Corps. The innovation of chemical weapons, especially mustard gas, introduced a new type of weapon that once again provoked widespread anxiety about global destruction, and chemical warfare discourse was characterized by a type of rhetorical instability comparable to that of Haymarket-era bomb talking. In response to widespread vitriolic condemnation of chemical warfare, Fries and West mounted a public relations campaign that advocated chemical warfare as a humane and efficient way to attain victory. In contrast to August Spies’s capitalization on the rhetorical instability of bomb talking, I argue that Fries and West negotiated the Malthusian Paradox by rhetorically attempting to stabilize the language of chemical warfare. They capitalized on an atmosphere of post-war political stability to legitimate chemical warfare and the Chemical Warfare Service. In my analysis of *Chemical Warfare*, I show how Fries and West utilized two prevalent stabilizing rhetorical tactics. First, in order to make mustard gas sound more appealing and to ease rampant fear of the new weapons, they used statistical proofs and comparisons to conventional weapons to downplay chemical warfare’s physiological effects. Second, they amplified the destructive power of “gas” with totalizing generalizations that elucidated the enormity of the new weapons’ threat on a global scale.

In chapter five, I examine the personal correspondence of atomic bomb physicist Leo Szilard. With doomsday images in his head, he began theorizing how to produce nuclear chain reactions in the early 1930s and later became an important figure in the Manhattan Project. In the final years of WWII, once he realized that the engineers and scientists working at Los Alamos would soon construct the Bomb, he reversed his pro-Bomb attitude and began lobbying for its abolishment and arms reduction. Recognizing the dire political consequences of nuclear fission, Szilard attempted to situate nuclear physicists, but especially himself, between the “truthful” realm of science and the manipulative realm of politics in order to gain political leverage. Once he had attained a somewhat influential policy voice, Szilard paradoxically used the capacity of atomic bombs to bring both peace and annihilation to advocate his nuclear policy ideas. I thus argue that Szilard negotiated the Malthusian paradox by being paradoxical. He used three primary rhetorical tactics to intervene in nuclear politics. First, he argued for physicists to display a “disinterested” scientific ethos to appear ambivalent about a scientific development that none of them should have appeared ambivalent about. Second, Szilard attempted to bargain with the government to classify and fund his research by pressuring FDR’s administration with a feigned desire to publish, in the midst of WWII, the “secrets” that could empower other states to develop the Bomb. Third, he attempted to build the professional consensus of atomic scientists. The formation and authority of scientific organizations, he argued, gave political credence to scientific thought. By uniting a body of many minds that would not allow the manipulation of scientific truth with political language, Szilard asserted that, because they had devised how to materialize the means to massive extermination, nuclear physicists were most capable of devising how to use the Bomb to bring peace.

To conclude, I show how the examination of these influential texts and rhetors indicates that some overriding rhetorical strategies emerged from their individual tactics. When taken together, these rhetorical moves helped to characterize weapons discourse. Although specific rhetorical tactics and strategies may fade from use with the innovation of certain weapons in certain contexts, all of the arguments, figures, and tropes used by Malthus, Spies, Fries and West, and Szilard are still at work. The rhetoric of nuclear terrorism provides a final glimpse into a contemporary moment in the continuing history of the Malthusian Paradox.

Conclusion

With the world's attention attuned to conflicting and uncertain probabilities that humanity, and all other life, could survive a war fought with so-called "ultimate weapons," navigating the Malthusian Paradox characterizes both current and past weapons rhetoric. As one element in an intricate history of war, the rhetorical history of weapons, of course, aligns itself with other narratives and rhetorical scholarship. The pre-history of weapons rhetoric leading up to the Trinity Test demonstrates that many of the commonplaces of late 20th century and 21st century weapons rhetoric have much older origins than the summer of 1945. So, in addition to elucidating a period of weapons and war rhetorics that have received, thus far, little attention, I aim to extend post-WWII studies of weapons rhetoric and add to the historical literature on the period since almost all studies of weapons rhetoric post-date the events that I examine. The following analyses of population control, dynamite, mustard gas, and early atomic bomb rhetoric are foundational because, in addition to expanding the scope of rhetorical scholarship, they buttress and support analyses of latter-day weapons and dangerous technologies.

Ultimately, my study is no different than the objects of its critique; it is itself a manifestation of exterminism and it offers a potential blueprint for the further deployment of the Paradox to justify brutality in the name of peace.³⁷ Although the following chapters lay out the successful rhetorical tactics and strategies that accompanied the development of WMDs, I modestly aim to help reinvent technology by promoting reflection on how weapons rhetoric helped invent our world. Like Walter Benjamin's conception of the "historical materialist" who "regards it as his task to brush history against the grain," I would dissociate myself from barbarism and "the transmission of barbaric documents from one owner to another."³⁸ However, "to brush history against the grain," critics must not only confront the barbaric rhetorical strategies of successful domination, but also the failed attempts at reform and revolt, as well as prescriptions to remedy humanity's greatest problems. Hence, I conceive my critical role as not only aiming to confront the rhetorical construction of weapons, but also aiming to confront speculative prescriptions for change and failed historical attempts to change the technological order. I offer an interrogation of weapons rhetoric to aim yet another level of criticism at the construction and maintenance of weapons of mass destruction, despite their apparent resistance to all manners of attacks and reformations. The historical trajectory of weapons rhetoric provides an opportunity to judge the successful and failed tactics, strategies, ethics, and ideas that have helped to shape how individuals and states interact.

Weapons rhetoric matters and is of utmost importance because weapons can threaten everybody. From individual weapons that threaten our communities, like the dynamite bombs of 1886 and fertilizer truck bombs, to the most destructive weapons yet invented like thermobaric, nuclear, and hydrogen bombs, the successes of weapons advocates who design, manufacture, and promote weapons result in death and destruction. Weapons are fearsome, so how we make them,

what we make, how we sell, how we deploy, and how we use rhetoric to negotiate, not just the Paradox, but the people who make weapons “happen” – from the inventor who invents the fuse to the thug or soldier who lights it – should be judged and held accountable.

¹ Plato, “Socrates’ Defense (Apology),” 8-9 [22d-e].

² Oklahoma Today, 9:02 a.m. April 19, 1995, 15.

³ This description is derived from McVeigh’s own account of the bombing. Michel and Herbeck, *American Terrorist*, 215.

⁴ Haber, “The Synthesis of Ammonia from its Elements,” 14.

⁵ Charles, *Master Mind*, xi. Worldwide nitrogen production from the Haber process increased from 6,798 tons in 1913 to 297,000 tons in 1920. Haynes, *American Chemical Industry*, vol. 2, 362.

⁶ In *Chemistry in Warfare*, Hessel, Martin, and Hessel claimed that “Germany did not start the last war until she believed herself to be capable of producing sufficient quantities of synthetic nitric acid to compensate the lack of Chilean nitrates which would be denied to her by a British blockade” (46). While indicating the importance of ammonium nitrate, from which nitric acid derived, this claim is inaccurate because it ignores Germany’s Schlieffen Plan, which called for swift and devastating victory, and which made massive munitions stockpiles unnecessary. “There was never any question that the new productive capacities would be permanent” (Johnson, “Technological Mobilization and Munitions Production,” 13). Although some German chemical plants were disassembled according to the Versailles Treaty, the Leuna plant and others remained, as a “dual use” factory. “These were to become vital producers of peacetime fertilizer, if no less vital sources of future military explosives” (16). The military and agricultural uses of nitrates made Allied disarmament of Germany difficult because shutting down its military facilities meant also shutting down its means to feed the German population and to speed civilian and industrial recovery. Most war gases presented similar problems. See Johnson and MacLeod, “The War the Victors Lost.”

⁷ Haber’s biographer, Daniel Charles, wrote that Haber was “a man who embodied the capacity of science to nourish life and destroy it.” Charles went so far as to proclaim that, “Haber was the patron saint of guns and butter. He was the founder of the military-industrial complex and the inventor of the chemistry through which the world now feeds itself.” *Master Mind*, xii-xiii.

⁸ According to one 2005 study, about 2 billion people would starve without nitrogen fertilizers. Charles, *Master Mind*, xiv.

⁹ Basic statements of this commonplace paradox are innumerable. Here are a few examples: Ernst Jünger wrote in 1932’s “Technology as the Mobilization of the World Through the *Gestalt* of the Worker” that, “Man appears to be either a sorcerer’s apprentice who conjures up powers he cannot control or the creator of an unprecedented progress that hastens toward artificial paradises” (269). In another iteration, he wrote that means “will be obedient tools of destruction as long as the spirit contemplates destruction; and they will be constructive as soon as the spirit decides for great buildings” (289). In *Technics and Human Development*, Lewis Mumford wrote that in ancient and modern history “immense gains in valuable knowledge and usable productivity were cancelled out by equally great increases in ostentatious waste, paranoid hostility, insensate destructiveness, hideous random extermination” (13). In 1942’s *Chemistry in Warfare*, Hessel, Martin, and Hessel wrote: “chemicals are not like the fig tree in the Bible; they can ‘bring forth both good and evil fruit.’ From the same raw materials come the most potent of destructive weapons, and products which contribute the most to our material progress. And often the processes by which both are made differ only in degree of purification and preparation” (132). In 1955’s “Can We Survive Technology?”, mathematician, game theorist, and computer scientist John von Neumann wrote regarding the global scope of nuclear energy, automation, and climate control: “one decisive trait must be considered: the very techniques that create the dangers and the instabilities are in themselves useful, or closely related to the useful. In fact, the more useful they could be, the more unstabilizing their effects can also be. It is not a particular perverse destructiveness of one particular invention that creates danger. Technological power, technological efficiency as such, is an ambivalent achievement. Its danger is intrinsic” (151).

¹⁰ In terms of the violent aspects of destruction, Stephen H. Browne noted about violence that it is “a situational constraint and inventional opportunity.” Browne, *Angelina Grimké*, 38.

¹¹ The primary writers in this field of rhetorical scholarship include Gordon Mitchell, Bryan C. Taylor, Lisa Keränen, Edward Schiappa, David Henry, Bob Ivie, Michael Hogan, Walter Fisher, Thomas B. Farrell, and Thomas Goodnight.

¹² See Schiappa, “The Rhetoric of Nukespeak”; Mitchell, *Strategic Deception*; and Keränen, ““Bio(in)security.”

¹³ Campbell, “Between the Fragment and the Icon,” 369. Frank L. Borchardt’s *Doomsday Speculation as a Strategy of Persuasion* described numerous instances of “apocalyptic” narratives that featured some form of technology. Often, however, the technologies that he depicted do not drive these apocalypses, but rather appeared as part of their contexts. In his historical studies, *Guns, Germs, and Steel* and *Collapse*, Jared Diamond wrote a compendium of populations, from tribes to civilizations, who either “chose” to destroy themselves with their technological decisions, or whom were destroyed by rival populations armed with superior military power. The premise of *Guns, Germs, and Steel* is that “literate societies with metal tools have conquered or exterminated the other societies” (13).

¹⁴ Plato, *Protagoras*, 319.

¹⁵ Plato, *Protagoras*, 320.

¹⁶ Ellul, “The Technological Order,” 97-98.

¹⁷ Ellul, “The Technological Order,” 97.

¹⁸ Beck, *Ecological Enlightenment*, 22-23.

¹⁹ Beck, *Ecological Enlightenment*, 2.

²⁰ Quoted in Shatz’s introduction to Bakunin, *Statism and Anarchy*, xvi.

²¹ Arendt, *On Violence*, 51 and 79. Arendt based her monograph on the Paradox in its specific manifestation with the Bomb, which she sees as a brand new development in the history of politics, war, and technology with no precedent. She wrote, “The ‘apocalyptic’ chess game . . . is being played according to the rule ‘if either ‘wins’ it is the end of both’” (3). She denied the prior history of the Paradox to make a paradoxical argument. Also see pp. 3-4, 9, 16-17, and 30.

²² Rather than “preservation,” technology scholarship and criticism often uses the term “salvation” to refer to the beneficial effects of technology. I prefer “preservation” because it somewhat brackets off the changing religious contexts of early modern and modern Europe. Deifying technology to explain the “secularization” of modern society has become an oft-named symptom of “modernity,” and hence a common topos for technology critics who examine the sudden proliferation of technology and industrialization in the 1700s and 1800s. With the decline of religious influence, science and technology, according to many arguments, take its place. I want to emphasize that the Paradox confronts people at all stages of history, regardless of religious climate. Many political and technological thinkers provided examples of technological “salvation” arguments. In *Statism and Anarchy*, Bakunin wrote of the use of massive force by States for the sakes of “preservation” and more often “salvation” (13, 20, 150, 167, and 197). According to Bakunin, the “moral code of the state” includes “the sacred right of conquest,” a “principle” that entitles governments to wage wars of any type for self-preservation (168). In “The Technological Order,” Ellul identifies the deification of technology as a myth that must be reversed in order to master technique (96). According to Lewis Mumford’s *Technics and Human Development*, “our contemporaries . . . concentrate, with manic fervor, upon the continued expansion of science and technology, as if they alone magically would provide the only means of human *salvation*” (4). The result of this fervor is that “Mechanics became the new religion, and it gave to the world a new Messiah: the machine” (45). On Mumford’s analysis of the deification of the machine, see pp. 53-56 and 365. According to David F. Noble’s *The Religion of Technology*, “Put simply, the technological pursuit of salvation has become a threat to our survival” (208).

²³ Mumford, *Technics and Human Development*, 55.

²⁴ Virilio, *The Information Bomb*, 39.

²⁵ Virilio, *City of Panic*, 32, emphasis removed.

²⁶ Campbell, “Between the Fragment and the Icon,” 347 and 346.

²⁷ Campbell, “Between the Fragment and the Icon,” 348.

²⁸ Campbell, “Between the Fragment and the Icon,” 353 and 364.

²⁹ Campbell, “Between the Fragment and the Icon,” 365.

³⁰ Campbell, “Between the Fragment and the Icon,” 367.

³¹ Campbell, “Between the Fragment and the Icon,” 350-351.

³² Vanessa Beasley also justified a longitudinal method in *You, The People*, in which she used rhetorical genre theory to draw multiple speeches and orators together. She wrote of her books methodology that, “In covering the time period of 1885 to 2000 . . . this book differs by offering both an interpretive and a longitudinal reading of the presidency. In other words, by providing critical analysis of the rhetoric of multiple presidents, this book offers an

alternative perspective that, while enabling me to offer only relatively minor insights into individual office holders, can hopefully provide a broader lens through which to view the institution of the presidency” (17).

³³ Statement made by Peters at his Rhetoric Reading Group presentation, University of Illinois (Feb. 2007).

³⁴ Benjamin, “Theses on the Philosophy of History,” 262.

³⁵ Benjamin, “Theses on the Philosophy of History,” 263.

³⁶ Carl Mitcham recommended a non-linear historical approach to technology scholarship: “Approaching the world of artifacts from . . . a pluralistic perspective, through the conditioning of different social and conceptual circumstances, would in turn help shake history loose from the debilitating pressures of progressive historicism.” *Thinking Through Technology*, 134.

³⁷ Edward Thompson coined the term “exterminism” in “Notes on Exterminism, the Last Stage of Civilization.” He defined exterminism as “those characteristics of society—expressed in differing degrees, within its economy, its polity and its ideology—which thrust it in a direction whose outcome must be the extermination of multitudes. The outcome will be extermination, but this will not happen accidentally . . . but as the direct consequence of prior acts of policy, of the accumulation and perfection of the means of extermination, and of the structuring of whole societies so that these are directed towards that end. Exterminism requires, of course, at least *two* agents for its consummation, which are brought into collision” (20).

³⁸ Benjamin, “Theses on the Philosophy of History,” 256-257.

Chapter 2

The Malthusian Paradox in *An Essay on the Principle of Population*

“It must be acknowledged that bad theories are very bad things, and the authors of them useless and sometimes pernicious members of society.”³⁹ —Thomas R. Malthus

The Reverend Thomas R. Malthus directed this polemic in 1798 at the many critics of *An Essay on the Principle of Population, as it Affects the Future Improvement of Society with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and other Writers* (1798). Malthus’s counterattack mirrored his critics’ accusations that his population theory presented British society with dangerous ideas from a dangerous advocate. According to Malthus, human fertility outpaces technological capacities to sustain population growth. With this general law as a premise, Malthus aimed to abolish the “Poor Laws” that had provided relief to paupers since 1597. Rather than assisting the “redundant” poor, already destined for lives filled with, in Malthus’s words, “vice and misery,” they must be “checked” lest their procreative power drain state funds, deplete natural resources, or otherwise cause calamity. The “principle of population” thus pitted economic and class interests against each other amidst the constraints of populations competing for basic biological survival.

Malthus and his *Essay* were controversial but influential. He was not the first political economist to explore the vexed relationship between human populations and their means of subsistence, but he was the first to bring the debate out from texts on political economy into common conversation, the popular press, and the British Parliament. His infamy increased as his essay circulated, and “Malthusian” came to refer to harsh governmental management of the poor,

ignoring the poor, and blaming the poor for their poverty.⁴⁰ James Bonar, an early Malthus scholar and biographer, sarcastically proclaimed of his subject, “He was the ‘best-abused man of the age.’ Bonaparte himself was not a greater enemy of the species. Here was a man who defended small-pox, slavery, and child-murder; who denounced soup-kitchens, early marriage, and parish allowances.”⁴¹

Yet, regardless of the invective directed at Malthus and his book, the “principle of population” won many adherents among rival political economists and politicians, as it vividly elucidated how the unequal powers of population growth and agricultural technology affect poverty, emigration, war, and domestic and international commerce. With vast numbers of poor people clogging London’s streets, “Malthusianism” influenced British political deliberations about how to handle Britain’s exploding population.⁴² Loath to admit the moral implications of eliminating large portions of the population through forced parish resettlement, forced emigration, incarceration in work houses, and general abandonment, consideration of the “principle of population” provoked Members of Parliament to consider solutions that drew from the darker side of Malthus’s assertions rather than from Malthus’s exhortations for people to show procreative restraint. For the paupers imprisoned in workhouses, it was Malthus’s inflammatory writings that were pernicious and “very bad things;” not those of Malthus’s critics.

In his own time, Malthus’s primary policy influence derived from his objections to Poor Law reformation. Around this issue Malthus became something of a pundit, and as early as 1800 the *Essay* circulated in government circles. Consequently, as rhetorical scholar Marouf Hasian wrote, Malthus’s population theory “became a part of the taken-for-granted scientific, moral, and legal wisdom of early nineteenth century England.”⁴³ He gained the ear of M.P. Samuel Whitbread in 1807, and influenced the reforms advocated by the 1817 Select Committee on the

Poor Laws, as well as the 1826 Select Committee on emigration.⁴⁴ He testified about emigration to the Select Committee of the House of Commons in 1827, and their final report showed a clear Malthusian influence.⁴⁵ In 1834, the year of his death, the British government validated the “principle of population” and “Malthusianism,” by passing new Poor Law legislation that presented paupers with an unappealing dilemma.⁴⁶ The law required them to choose to either banish themselves to decrepit work houses or banish themselves from all future welfare.⁴⁷

In addition to his influence on Poor Law reform, Malthus gained fame as a political economist and demographer. In 1805, the East India Company’s college at Haileybury appointed him to the first professorship in political economy in Britain, from which he published influential economic treatises, on wages, rent, and grain importation, including *Principles of Political Economy* (1820). In political economy, “Malthusian” came to refer to theories of diminished economic returns derived from population growth, and basing wage theory on the “principle of population.” From his economic research, Malthus recognized that history tended to focus on the wealthy, so his quest to prove his population theory by compiling as much statistical information about understudied poor people made him a founding figure of demography.⁴⁸

An assumption about the potential of technology to both improve a society’s means of subsistence and to destroy its living members was implied within Malthus’s work.⁴⁹ This assumption became more explicit when Malthus the man began transforming into Malthusianism the ideology.⁵⁰ Malthus was a technological thinker, positing that if prudence failed to check “overpopulation” (i.e., the poor restraining their reproductive habits), then social and political authorities must devise technical methods to manage both procreation and agriculture. As the meaning of Malthusianism spun out of Malthus’s direct control, subsequent iterations of his population theory became even more closely associated with technology.⁵¹ The Malthusian

League's rationalization of birth control technologies as a way to manage overpopulation is an overt example.⁵² Elsewhere, eugenics, forced sterilization, concentration camps, and genocide drew upon Malthusianism for justification.⁵³ Malthusianism's technological claims reverberate even now. For example, historian Paul Kennedy wrote in 1993, "the greatest test for human society as it confronts the twenty-first century is how to use the 'power of technology' to meet the demands thrown up by the 'power of population.'"⁵⁴ In these ways Malthusianism has borne a technological legacy as Malthusians, Neo-Malthusians, and even their critics took the latent technological aspects of the "principle of population," and made them primary foci of overpopulation analyses. Hence the ism that bears his name – Malthusianism – still "colonizes our future."⁵⁵

I suggest that one way in which it does so can be seen in weapons rhetoric. The rhetorics of the 19th and 20th centuries that justified the construction and use of weapons of mass destruction drew on central Malthusian themes of overpopulation, state-preservation, and anxiety about global destruction. In this way, only part of the *Essay*'s rhetorical importance derives from Malthusianism's lingering influence on governmental assumptions about how to assert technological control over population management. An equally important aspect of Malthus's legacy is found in the history of weapons rhetoric as weapons rhetors drew on Malthusian themes, and repeatedly negotiated a paradox endemic to Malthus's own work, and that of his successors: namely, weapons were both promoted as the means to preserve humanity from annihilation and denigrated as the means to annihilate humanity.

Therefore, this chapter aims to show how Malthusianism functioned as a "pre-text" of weapons rhetoric, first by examining the centrality of this technological paradox in Malthus's population theory. Then, I will analyze Malthus's writings about population to demonstrate how

Malthus depended on particular rhetorical tactics to negotiate the Paradox. Malthus's sublime statistical ratios, universal generalizations, and "machine" *antistasis* undergirded the technological plausibility of his "principle of population." Because I argue that Malthus's iteration of the Paradox has profound ramifications for understanding the development of latter-day weapons, especially weapons of mass destruction, I conclude by indicating the ways Malthusian rhetoric appeared to corroborate 19th century concepts of war that rationalized annihilation in the name of preservation.

Malthus and the Paradoxes of Technology

Malthus, in his polemic against the utopian "sect of speculative philosophers" William Godwin, the Marquis de Condorcet, and other idealistic supporters of the French Revolution, disparaged the use of rhetorical paradox. Condemning the utopians as "artful and designing knaves" and "mad-headed enthusiasts" who advanced "silly speculations and absurd paradoxes,"⁵⁶ he argued that the very concept of utopia bred paradoxical thinking about the plausibility, benefits, and happiness of living a trouble-free and immortal life of leisure in a world limited by natural resources.

Many, I doubt not, will think that the attempting gravely to controvert so absurd a paradox as the immortality of man on earth, or indeed, even the perfectability of man and society, is a waste of time and words, and that such unfounded conjectures are best answered by neglect. I profess, however, to be of a different opinion. When paradoxes of this kind are advanced by ingenious and able men, neglect has no tendency to convince them of their mistakes."⁵⁷

Malthus's vehement criticisms of utopianism, however, neither carried over to criticism of the concept of paradox itself, nor caused him to jettison paradoxical arguments from his own treatises. Rather than avoiding paradoxes, Malthus depended on his own erudite use of them to explicate his population theory. As Bonar noted in his 19th century interpretation of

Malthusianism, “The main position of the [*Essay*] was so incontrovertible, that when the critics despaired to convict Malthus of a paradox, they charged him with a truism.”⁵⁸

Indeed, at first glance, Malthus’s “principle of population” might seem more straightforward than paradoxical. According to Malthus’s basic argument as stated in the first *Essay*:

The power of population is indefinitely greater than the power in the earth to produce subsistence for man. Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will shew the immensity of the first power in comparison to the second. By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal.⁵⁹

Few could assail the basic premises that humans procreate more easily than they increase their means of subsistence. As publisher Hutches Trower wrote to Malthus’s friend and rival political economist David Ricardo in 1821, “Whether population will double itself in 25 or in 50 years is of no moment as far as the *principle* is concerned.”⁶⁰ But, extrapolating the effects of Malthus’s ratios showed that preserving one population entailed threatening other populations, and in the controversy surrounding what to do about poor people, industrialization, and popular ethics, policy debates often took paradoxical turns as people weighed the benefits and disadvantages of technological population management. “Keeping the two unequal powers equal” would require massive technological projects and governmental oversight in order to abrogate the universal and perpetual natural laws that Malthus proclaimed in his *Essay*. By arguing that the benefits of managing sustenance and procreation would entail making choices that would harm a large segment of England’s population – the poor – Malthus announced the prototypical importance of the Paradox for deliberations about how to use technology.

I suggest that, of the paradoxes that inhabit Malthus’s corpus, his population theory exemplifies a central paradox, a paradox ingrained in technological solutions to social and

political problems, what I call the Malthusian Paradox. The Malthusian Paradox posits the contrary capacities of technology to annihilate humanity and to preserve humanity from annihilation. The material elements of Malthus's *Essay* – industrialized mass production, agriculture, war, poverty, and population – indicate that one should understand the “principle of population” as a technological principle.

Two fundamental aspects of his “principle of population”—his concept of “positive checks” and his assessment of agriculture—best exemplify how Malthus articulated this Paradox in the *Essay*. Malthus's concept of the “positive checks” to population growth demonstrated how technology threatened certain populations while preserving others. According to Malthus, “positive checks” bring population and sustenance into balance with each other by killing the excess population. Positive checks do not work alone to regulate population levels; they work in tandem with “preventative checks,” which are the prudence and “moral restraint” that people use when deciding whether or not to marry and procreate.⁶¹ Preventative checks are an essential component of Malthus's population theory, but they are non-technological in character. In contrast, positive checks are rooted in whether or not a population has the technological capacity to assert control over procreation and death. Malthus listed numerous positive checks: “unwholesome occupations, severe labour and exposure to the seasons, extreme poverty, bad nursing of children, great towns, excesses of all kinds, the whole train of common diseases and epidemics, wars, pestilence, plague, and famine.”⁶² That Malthus lumped phenomena that are clearly technological—factories, cities, and the means to wage war—together with more organic phenomena, e.g., nursing, diseases, and harsh weather, as external agents of population decline, implied that population management required technical control over all biological and behavioral aspects of human life.⁶³ The more humanity can use technology to control these external agents

of population decline, the more it can preserve life. But, as Malthus always reminded his readers, the preservation of life would come at the severe cost of disaster once a population reached the Malthusian limit. If not left to run their “natural” course, “positive checks” required oversight to avoid both massive die-offs and catastrophic population explosions.

Malthus further implied that humanity could use these “positive checks” to reduce or eliminate undesirable populations, or so his critics extrapolated from his thought. One of his most prolific critics, William Cobbett, asserted in 1805 that Malthus did make this argument: “Mr. Malthus...has not scrupled to recommend *checks to population*, as conducive to the good of mankind.”⁶⁴ In fact, Malthus tended to emphasize moral education as the solution to Britain’s overpopulation problem, and he was careful to clarify that he did not encourage war as a means to check populations.⁶⁵ Nevertheless, Malthus made the willful destructive abuses of technology and their effects crucial variables for thinking about the problems of population management.

Thus when considering the first national census (1801), which showed that Britain’s population was exploding during a time burdened with not only the expansion of dangerous factory work, but also war and famine, Malthus wrote that, in “one of the most extraordinary facts in history,” at Britain’s exit from the Napoleonic wars, “not only were the wealth and population of the country considerably greater than they were at the commencement of the war, but they had increased in the interval at a more rapid rate than was ever experienced before.”⁶⁶ Furthermore, similar data showed that France’s population increased during the Revolutionary War such that Malthus conceded “considerable surprise” that the conflict resulted in an “undiminished state of the [French] population in spite of the losses sustained during so long and destructive a contest.”⁶⁷ In these ways, as he surveyed populations expanding despite destructive

technological enterprises like industry and war, Malthus introduced technology as a factor for analysis and suggested its effects were not straightforward, but paradoxical.

Malthus's assessment of agriculture best-exemplified the paradoxical way that he took up the question of technology. Malthus undermined the commonplace view that producing more food is always a good idea, and thereby rewrote the concept of agriculture as a primary cause of annihilation. According to Malthus, agriculture could prove *too successful*. Malthus argued that agricultural technology threatened populations first by empowering too much population growth, and then by failing to keep pace with the population growth it spurred. The resulting shortage would cause more and more death as the crisis would develop. Malthus wrote in the second *Essay* that “the want of food...is the most efficient cause of the three great checks to population which have been observed to prevail in all societies is evident from the rapidity with which even old states recover the desolations of war, pestilence, famine, and the convulsion of nature.”⁶⁸ Thus, of the positive checks, the technological failure of agriculture causes the swiftest die-offs, and the larger the population disparity, the larger the die-off. Agriculture preserves and sustains but, at the Malthusian limit, it exacerbates annihilation. The lack of food was the “ultimate check,” because it killed of its own accord, and because it led to further positive checks that hastened population decline.⁶⁹

Malthus therefore asserted a skeptical view of agricultural technology. In the second *Essay*, he claimed that, “the fact is, that as no country has ever reached, or probably ever will reach, its highest possible acme of produce, it appears always as if the want of industry, or the ill direction of that industry, was the actual limit to a further increase of produce and population, and not the absolute refusal of nature to yield any more.”⁷⁰ 19th century advances in agricultural technology, such as the conversion of between two and three million acres of “waste land” into

cultivable land, innovations in crop rotation, fertilization, drainage, rearing and breeding livestock, more intensive cultivation, chemistry, elimination of fallow, concentrated holdings, reaping and threshing machines, iron ploughs, and the publicizing of new these methods left Malthus nonplussed.⁷¹ All of these agricultural techniques proved that people could empower population growth, but none of them proved that they could provide any more than a small incremental increase of productivity during a famine or other food crisis. Malthus conceded that humanity could produce more food, and he welcomed any such increase to alleviate poverty in the short term, but such small improvements ultimately indicated humanity's incapacity to prevent overpopulation rather than its capacity to meet population needs.

The combination of food shortages with political discontent in turn of the century Britain provided Malthus with a more specific example of agricultural technology's paradoxical implications. In the second *Essay*, Malthus wrote, "had it not been for the [British standing army], the distresses of the people during the late scarcities, encouraged by the extreme ignorance and folly of many among the higher classes, might have driven them to commit the most dreadful outrages, and ultimately to involve the country in all the horrors of famine."⁷² Far from delivering Britain from want, recent increases in agricultural production had empowered too many births. The "redundant population" subsisted, but when the dearth struck, famine erupted. These people might not have existed save for recent agricultural innovations, but they faced perishing from the failure of agriculture to increase productivity fast enough. Within this milieu, revolutionary spirit increased with increased misery and desperation. Hence for Malthus the technological paradox had severe political consequences: "If political discontents were blended with the cries of hunger, and a revolution were to take place by the instrumentality of a mob clamouring for want of food, the consequences would be unceasing change and unceasing

carnage, the bloody career of which nothing but the establishment of some complete despotism could arrest.”⁷³

Paradox thus enhanced a simple understanding of Malthus’s complex population theory by demonstrating the competing preservative and destructive tendencies inherent in agricultural technology. According to Dale Cyphert, “the performance of paradox...yields authentic understanding.”⁷⁴ In Malthus’s case, his population theory lent “authentic understanding” to the basic conundrum that what kills will save and what saves will kill. In Malthus’s formulation, even a technology as beneficial as agriculture gets implicated as a probable cause of catastrophe. The paradox of agriculture made the technological tragedy of Malthusianism plausible.

This Malthusian Paradox persists both as the specific iteration of Malthus’s population theory in a world where agricultural technology grinds along to keep pace with population growth, and as the general technological paradox that pits every machine’s advantages and disadvantages against each other. Malthus’s exposition of the positive checks showed how any assessment of technology made negotiating the Paradox almost unavoidable. After Malthus, apparent technological necessities for human survival, like improvements in sanitation, medicine, and agriculture, not to mention weapons, could appear “bad” because they kept too many people alive. This Malthusian extension of his “principle of population” shows how fundamental the Paradox is to technology in general: controlling disease, epidemics, pestilence, and plague with improvements in medicine and sanitation helped to sustain poor people, but such inventions kept them alive to face death in other gruesome ways. Therefore beneficial technologies needed to be further controlled, mastered, and manipulated in order to control, master, and manipulate ever larger populations. Malthus, by shattering the common conception that agricultural technology and increased productivity are good for humanity, re-conceptualized

agriculture as fraught with mortal danger. He made it apparent that no longer could any technology be conceived of in strict Manichean terms, and any rigorous technological argument must address both the “good and evil” of any technology.

For weapons proponents as well, this Paradox could not be avoided, but had to be rhetorically negotiated. At the most basic level, weapons advocates—acutely, of the most destructive weapons—have had to argue that the technological power to annihilate represents the technological power to preserve. In order to save and protect, one must have the power to kill and destroy. In this way, the Paradox confronts weapons rhetors with an argumentative dilemma that they cannot solve, but that they must attempt to rhetorically negotiate. In this regard, Malthus’s own rhetorical means of navigating the Paradox can be seen as paradigmatic. I therefore turn to an examination of how Malthus negotiated the paradox of his population theory.

The Mathematical Sublime, Universal Generalizations, and Machine Antistasis: Malthus’s Rhetorical Navigation of the Malthusian Paradox

Malthus’s writings demonstrate that he recognized “technology” as both concrete artifact and abstract principle. The “principle of population” was a technological principle, Malthus a technological thinker, and his writings imbued with the paradoxes of technology. And Malthus was no stranger to argumentation and rhetoric either. His publications and personal correspondence contain innumerable accusations of his rivals’ fallacious arguments, bombastic rhetorical inventions to sustain his polemical jousting with friends and enemies alike, and fastidious debates over the definitions of political economy’s common terminology. Thus, as he navigated the paradoxes of his population theory by amplifying the abstract and concrete dimensions of technology, Malthus’s rhetoric was deliberate. He amplified the abstract

dimension with sublime geometrical and arithmetical ratios that presented absurd environmental scenarios well beyond possible sustainability, and with global generalizations of localized technological effects that made the Paradox appear universal. He amplified the concrete aspects of technology with a type of antistasis, in which the word “machine” revealed how a single device could become rhetorically imbued with so much simultaneous preservative and destructive power. These rhetorical tactics helped in the conversion of his “principle of population” into technological Malthusianism. Malthus’s genius was, in part, rhetorical—a capacity to find the means to popularize his population theory when caught up in such unsolvable paradox. In the longitudinal trajectory of weapons rhetoric, Malthus provided a rough outline of commonplace tactics to negotiate the Paradox, an outline from which weapons rhetors could draw in their own confrontations with the Paradox.

The Geometrical and Arithmetical Ratios

Malthus proffered the geometrical and arithmetical ratios as statistical proof that humanity’s capacity to increase population far outpaces its capacity to increase agriculture and subsistence.⁷⁵ The resultant numerical disparity indicates how the Paradox became an almost inescapable conundrum for technological population control. According to Malthus, the geometrical increase of people shows how populations double over short periods according to the progression 1, 2, 4, 8, 16, 32, etc. The arithmetical increase of food production shows how subsistence grows according to the slower progression 1, 2, 3, 4, 5, 6, etc.⁷⁶ Should these ratios hold true, then human populations would soon reach unsustainable and calamitous levels. The first *Essay* used the ratios to describe the implausibility of American and British abilities to

increase agricultural outputs to meet a speculative spike in population, and the resulting calculations amplified the probable disparity to the point of sublimity.

In America Malthus found corroboration that population doubles every 25 years when abundance permits. So, according to the ratios, population would outpace food production such that the difference would be 4,096 to 13 in three centuries, “and in two thousand years the difference would be almost incalculable, though the produce in that time would have increased to an immense extent.”⁷⁷ The ratio of population surpassing means of subsistence by 4,096 to 13 may sound absurd, but it offered a clear illumination of the potential devastating effects of the “principle of population.” Catastrophe would ensue long before the ratios could increase to 4,096:13. “In these ages want would be indeed triumphant, and rapine and murder must reign at large,” he wrote, leaving visualization of “rapine and murder” to readers’ imaginations.⁷⁸ Malthus conceded that this extreme disparity of 4,096:13 “could never have existed,” but as part of the stunning character of the ratios, he left the fate of the American population open to gloomy speculation.⁷⁹

The impossible statistical disparities Malthus calculated from his ratios garnered both calumny and brief rhetorical glosses that indicate that Malthus was using a type of “mathematical sublime” to prove the “principle of population.”⁸⁰ Because the ratios represented two ideal tendencies, few proofs of their exact numerical manifestation existed, and they therefore provided an easy target for his critics. Of the ratios, Karl Marx wrote in *Grundrisse* that, “Malthus’s fantasizing profundity expressed itself in a pure childlike kind of calculation,” one that “he has fished purely out of thin air, and which rests neither on natural nor on historical laws.”⁸¹ Malthus scholars have treated the ratios with more kindness, and the ratios have received multiple cursory rhetorical explanations. Bonar called them a “mathematical simile,”

Samuel Hollander called them a “polemical device,” and Anthony Flew stated that they “added an air of drama and precision.”⁸² That Kenneth Smith called them “bewildering” begins to indicate their rhetorical connection to the Paradox. Smith wrote that, “What Malthus does...is to make men’s minds reel in an attempt to reach infinity by counting,” and as the numbers become more and more implausible, they “serve to bewilder the reader; they serve to impress him with the overwhelming superiority of the power of population.”⁸³ That a population could outpace agriculture 4,096:13 in 300 years is a bewildering and overwhelming ratio. Even in its speculative impossibility, the ratio amplified the stakes for how populations control their technology, because such an overwhelming disparity between population and food demanded attention.

Malthus’s ratios provided readers of the *Essay* with a stunning, overwhelming, and fearful sign of the Malthusian limit by amplifying the problem of overpopulation to the point of sublimity. In this way, the rhetorical function of the ratios derived from Malthus’s use of what Kant called “the mathematical sublime.” According to Kant, when the magnitude of numbers grows more and more enormous, “Our imagination strives to progress toward infinity, while our reason demands absolute totality as a real idea, and so [the imagination], our power of estimating the magnitude of things in the world of sense, is inadequate to that idea.”⁸⁴ In the case of Malthus’s population theory, as the disparity between procreation and agriculture grows in magnitude and culminates in a ratio like 4,096:13, it becomes more difficult to grasp the total severity of the problem. The numbers are so large they both draw attention and defy simple assessment. Thereby judging the “principle of population” and its ratios, in the words of Kant, “strains the imagination (of expansion) to its limit.”⁸⁵ The mathematical sublime thus inhibits understanding the enormity of the total claim.

The speculative disparity of 4,096:13 may have strained the imagination, but it represented growth in ideal conditions. Before the ratios reach a sublime magnitude, one can understand the disparity between procreation and agriculture in a more practical sense. Thus, Malthus's amplification of the ratios to the point of sublimity perhaps forced his audience to consider the overwhelming direness of the population problem, while a lesser disparity indicated that technology could be implemented to maintain a balance between the two competing powers of productivity before disaster strikes. In short, Malthus's sublime ratios may have stunned and overwhelmed his audience, but they clarified the stakes of technological population management.

Malthus's ambivalence regarding whether the ratios should be considered exact calculations or not further indicates that they helped to prove his population theory more by producing a sublime impression than by producing a rigorous statistical proof. Malthus emphasized the ratios in the early editions of the *Essay*, but he qualified his position on the value of "facts and calculations" in the second *Essay*, writing "Should any of them nevertheless turn out to be false, the reader will see that they will not materially affect the general tenour of the reasoning."⁸⁶ Malthus used the ratios as static, ideal representations that rigidified the chaos of life into a natural law. They represented "true" premises, but the exact numbers were "false" in most cases. While the theory was "universal," the evidence was inconsistent. In spite of their statistical faultiness, they proved the general validity, or the "general tenor," of the "principle of population." The ratios tended to generate extreme conclusions, but a statement that Malthus disparaged reaching such conclusions in political economy further casts doubt onto whether the ratios should be considered exact or not. The "tendency to extremes is exactly what I consider as the great source of error in political economy where so much depends on proportions," he wrote

in *The Principle of Political Economy*.⁸⁷ Numbers and facts could vary without impugning the universality of the “principle of population,” because these inconsistencies did not disprove the “principle” per se. In contrast to demonstrating that a specific population must not pass an exact level of growth without providing an exact amount of food, which a strict reading of his statistics would indicate, the ratios’ “tendency to extremes” simply impressed that population was the paramount problem.

Britain provided Malthus with another opportunity to amplify the effects of the population problem to the point of sublimity, this time by using the geometrical ratio to demonstrate agricultural limits. By imagining agricultural innovation proceeding in a geometrical rate, Malthus, for a moment, adopted a position contrary to his own ratio.⁸⁸ Malthus began by conceding that Britain might geometrically double its agricultural output in the upcoming quarter century as the maximum possible increase.⁸⁹ With several recent food shortages this twenty-five year doubling could have seemed implausible, but still possible. But, Malthus averred that such a rapid initial geometrical increase in agricultural productivity would be brief and unrepeatable. He argued that a further geometrical doubling of the land’s agriculture in the next quarter century (a quadrupling of the original productivity), would be “impossible.”⁹⁰ Each time Malthus multiplied agricultural increases by the geometrical rate, the prospective ingenuity required to reach such feats approached the sublime. He therefore moved closer and closer back to his original position that agriculture increases in an arithmetical rate at each calculation. Britain did not possess the technological ingenuity to pull off the feat of quadrupling agriculture in fifty years, much less to pull off the necessary octupling of productivity in seventy-five years, and so forth. In an era just after a string of famines, geometrical doublings of agricultural productivity sustained over many decades would not have seemed feasible in its

almost unimaginable depiction of abundance. Malthus indicated this sublimity with sarcasm: “In a few centuries it would make every acre of land in the Island like a garden.”⁹¹ He directed this cutting remark, and his British example as a whole, at Godwin’s conception of leisure-filled utopia. But at the same time, Malthus’s sarcasm amplified the limits of agriculture’s preservative power. With the conversion of Britain into an uninterrupted lush garden an unattainable endeavor that would require a mathematical increase in subsistence as sublime as his statistical predictions about American disparities between population and agriculture, Malthus intimated that practical attention to Britain’s overpopulation problem should not rely on agriculture alone. Rather, Malthus argued, the solution would derive from moral education and elimination of the Poor Laws, while Malthusians argued the solution would derive from the accumulation of better technologies for population control.

Once Malthus had portrayed the preposterousness of converting the entire surface area of Britain into a massive garden, Malthus again used his ratios to depict a more “melancholy picture” of Britain. If agriculture would not preserve everyone, it would destroy many. He forecasted that in a few cycles of statistical progression “we shall see twenty-eight millions of human beings without the means of support; and before the conclusion of the first century, the population would be one hundred and twelve millions, and the food only sufficient for thirty-five millions, leaving seventy-seven millions unprovided for.”⁹² The seventy seven million citizens struggling for basic survival were what Malthus called “the redundant population.” The Malthusian limit marked a boundary between those welcome at society’s “feast” and those shunned.⁹³ This boundary, enumerated by the ratios, cast out a certain percentage of the population incapable of providing its own sustenance by portraying them as unnecessary at best and a threat at worst. Malthus’s prediction of so many people immersed in death and destruction

once again approached the mathematical sublime. The doomed population, seventy-seven million strong, would not be as statistically insignificant to British morality as they would be to British capitalism. The ratios thus defined those members of a population most in need of technological preservation in the face of probable annihilation.

Amplifying the ratios to the point of sublimity also amplified the urgency to manage and control this statistical remainder. Techniques to control the redundant population did not always focus on preservation, but often on abandonment or “checking” their growth. When the statistical disparity between the powers of procreation and agriculture were so extreme, the ratios thus seemed to rationalize the redundant population’s marginalization. Because most cases of overpopulation threatened the already poorer and powerless classes with starvation, conscription, and “unwholesome” jobs, the British government, industries, and military could continue or increase their poor treatment of them with impunity. Neither agriculture nor manufacturing could provide the redundant population with subsistence, so they were destined not to lives in an abundant garden, but to lives, in the words of Hobbes, “poore, nasty, brutish, and short.”⁹⁴ The “redundant” will die one way or another. Perhaps of factory conditions, perhaps of war, perhaps of famine, but always a large mass of people sits on the brink of destruction unless ethical and effective resource management gets implemented. Malthusians, if not Malthus, thus regarded the poor’s superfluity and societal burden as a justification for harsh or brutal treatment. Their sublime speculative numbers warranted their getting checked before disaster might strike. Hence the logic behind Parliament’s codification of Malthusianism in the 1834 Poor Law that dictated an incremental increase in its harsh treatment of paupers. The technology of the work house was not meant to preserve Britain’s statistical remainder, but to eliminate them through profitable attrition and procreative deterrence.

In later editions of the *Essay* Malthus revised some of his statistics to reflect new evidence without changing any of his claims, and he finally dropped the ratios from the 1826 edition. But, Malthus did not drop the competing productive premises that Malthus intended the ratios to prove. Even without amplifying his ratios to the point of sublimity in the final edition of the *Essay*, his population principle still drew attention to the Paradox. The statistics made the population problem appear sublime, but after their removal the principles behind the ratios still implicated technology as the solution and the cause of humanity's precarious relationship to its resources. In the decades after Malthus's death, agricultural innovations did keep pace with population growth much better than Malthus anticipated. Global population growth exploded with many fewer shortages and famines. Malthus's population theory, however, showed that large populations should not find solace in its agricultural ingenuity, but a warning that the larger the global population grows, the greater the eventual catastrophe.

Universal Generalizations

Part of the mathematical sublimity inherent in imagining the outcome of Malthus's ratios involves discerning the speculative terrible effects that massive disparities between population and agriculture will cause. According to Malthus, any large disparity between population and subsistence would cause catastrophic warfare long before it reached 4,096:13 or left seventy-seven million to starve. Violence would become necessary in order to assure basic survival, and the greater the disparity, the greater the magnitude of violence.⁹⁵ Malthus also tended to generalize the effects of his ratios to the entirety of the earth in order to prove the universality of his "principle of population." His ratios worked in concert with his generalizations: once the ratios established war as the probable result of the "principle of population," his generalizations

amplified the scope and severity of war to a global scale. Therefore when Malthus incorporated war into his universal principle, war became a universal threat. Malthus thus amplified his generalization to the point of universal abstraction, far beyond what he could prove from localized examples. By moving from localized examples to generalized abstraction, Malthus showed how both agricultural and military technologies trended toward situations that cause mass death, if not extermination or extinction, in an increasing scale.⁹⁶ Specific technologies appeared poised to annihilate all of humanity in the same ways they annihilated local populations in the past. Because every society must abide by the “principle of population,” Malthus could promote any one local effect of his population theory as the speculative fate of the whole earth as long as it fit the general tenor of his “principle.” And Malthus chose to amplify the probability of horrific warfare. Agriculture will feed humanity to the brink of catastrophe, and weaponry will facilitate the ensuing collapse. Malthus seldom let mentions of war pass without magnifying and generalizing local effects to global scales. He amplified his generalizations about war in several steps that each increased the level of magnitude: he implied global annihilation by using hyperbolic language to depict a singular ancient conflict, he made a specific inductive argument that moved from an American example to a universal conclusion, and he amplified his generalization about global bloodshed to the point of abstraction.

As much as generalization was central to Malthus’s argumentation, he complicated his conception of the tactic by sometimes disapproving of its use because it supported the faulty arguments of his utopian rivals.⁹⁷ At the beginning of *The Principles of Political Economy* he questioned the precision of generalization by asserting that the “tendency to simplify and generalize” causes rampant *post hoc ergo propter hoc* fallacies.⁹⁸ In turn, Malthus objected to the utopian generalization that the unceasing accumulation of technological knowledge will solve all

problems, and he accused Godwin and Condorcet of being elated, giddy, and drunk from scientific induction.⁹⁹ But by no means did his negative critiques of generalization lead Malthus to question the usefulness, if not necessity, of generalization for proving his population theory. Malthus used a basic deductive formula in the first *Essay*, positing his “principle of population” as a general premise and using specific examples to prove it, while in the second *Essay* he used a basic inductive formula, moving from his population theory and its supporting examples to make broader claims about humanity’s future prospects. In his preface to the second *Essay* Malthus wrote, “The main principle advanced is so incontrovertible that, if I had confined myself merely to general views, I could have entrenched myself in an impregnable fortress; and the work, in this form, would probably have had a much more masterly air.”¹⁰⁰ But, as a point of methodology, Malthus endeavored to support his generalizations at every step with explicit examples.

Before examining how Malthus amplified his generalizations about war, it is necessary to examine how he advanced the “principle of population” as a universal theory. When Malthus moved from analyzing specific examples of his ratios, like events in America and Britain, to speculating about the fate of all people, his population theory underwent globalized generalization. Whether working with deductive arguments in the first *Essay* or inductive arguments in the second *Essay*, he almost always concluded his arguments with generalizations that amplified his findings about local examples by speculating about how they would apply to the “whole earth.”¹⁰¹ For instance, after examining some effects of British emigration on population change, he made such a generalization in the first *Essay*. He wrote, “But to make the argument more general and less interrupted by the partial views of emigration, let us take the whole earth, instead of one spot, and suppose that the restraints to population were universally

removed.”¹⁰² In addition to Britain, Malthus proved the basic validity of the premise that population levels are tied to sustenance by spanning the globe to find examples. Especially in the second *Essay*, Malthus justified his generalizations with the sheer evidential weight of many geographic examples. As his demographic studies traversed the globe in time and space, from ancient times to modern, from England to Europe, and from Europe to America, Africa, east Asia, southeast Asia, Siberia, the South Sea islands, and beyond, from region to region, he ended up transcending it. The “whole earth” proved his premises correct, and in the words of Robert M. Young, established his population theory as “a universal law, valid for all populations at all times.”¹⁰³ Even as every society attempts different techniques to manage population and agriculture with varying degrees of success and failure, no society can escape the “incontrovertible truths” that abundance empowers procreation, famines check procreation, and unchanging productivity keeps population growth somewhat stable.¹⁰⁴ Convincing his audience of the universality of this balance was Malthus’s greatest rhetorical achievement according to Arthur E. Walzer.¹⁰⁵ After Malthus, the “whole earth” did take notice of the population problem.

In the first *Essay*, before making an explicit “whole earth” generalization about the effects of war, Malthus depicted a small war by amplifying the level of violence to imply a more general global catastrophe. Looking backward to an ancient conflict, the “barbarian” conquest of Scythian shepherds, he wrote, “Gathering fresh darkness and terror as they rolled on, the congregated bodies at length obscured the sun of Italy and sunk the whole world in universal night. These tremendous effects, so long and so deeply felt throughout the fairest portions of the earth, may be traced to the simple cause of superior power of population to the means of subsistence.”¹⁰⁶ Malthus then reflected that, “In these savage contests many tribes must have been utterly exterminated.”¹⁰⁷ This “utter extermination,” whether hyperbolic or not, provided a

concrete example of one population that destroyed another population in a war caused by the dictates of biological survival. It was an example Malthus could use to imagine a larger catastrophe. Knowing that Scythians were exterminated to make room for ancient colonists, the fate of an overpopulated entire earth appears even bleaker. It stood to reason that modern indigenous populations would meet the same fate as European colonies proliferated, according to the generalization of Malthus's universal law of population. And by implication, overpopulation threatened the "whole world." But, the magnitude of the "tremendous effects" suffered long ago by the Scythians would be much greater at the turn of the 18th century, with the mass of "congregated bodies" much larger, the "darkness and terror" greater, and not just Italy, but more of the "whole earth" affected. Thus, he amplified the ancient Scythian crisis to portray a problem of universal modern importance.

In the second *Essay* Malthus made a more specific inductive argument that generalized from specific examples of conflicts in America to amplify a universal conclusion that the global population could suffer a brutal war of extermination. He prophesied that, "If America continue increasing, which she certainly will do, though not with the same rapidity as formerly, the Indians will be driven further and further back into the country, till the whole race is ultimately exterminated."¹⁰⁸ Agricultural improvements did not provide liberty to the entire American population, and failed to provide moral protection. Domestic expansion of crops and manufactured goods came at the price of Native American lives. When European colonists proliferated, they wiped out entire native populations, counterbalancing sustenance and population with "positive checks." Malthus took his empirical observations of violence against Native Americans and the universality of his population theory as impetus to generalize extermination and amplify a possible global crisis. Malthus wrote, "These observations [of

American Indian wars] are, in a degree, applicable to all the parts of the earth, where the soil is imperfectly cultivated.”¹⁰⁹ But according to the skeptical view of agriculture that Malthus promulgated, he was asking his readers to imagine a scenario in which every population in every country across the globe would die in an unmerciful, horrific spate of killing. He was asking his readers to imagine a slaughter in which women and children get wiped out by invaders driven to commit atrocities by the simple dictate of biological survival. Given the results of Native American wars and American colonial wars, the result of such a war of extermination in “all parts of the earth” would jeopardize the survival of large populations on every continent, if not the near extinction of humanity. The universality of the “principle of population” implied to readers that they, too, might end up committing atrocities in a time of crisis, if not falling victim to someone else’s hatchet or bayonet.

Having generalized utter extermination from the local level to the global level, he further amplified his generalization of universal warfare to the point of abstraction. In the first *Essay*, he described how overpopulation and war combined to push the level of violence upward in an increasing scale of annihilation:

Premature death must in some shape or other visit the human race. The vices of mankind are active and able ministers of depopulation. They are the precursors in the great army of destruction; and often finish the dreadful work themselves. But should they fail in this war of extermination, sickly seasons, epidemics, pestilence, and plague, advance in terrific array, and sweep off their thousands and ten thousands. Should success be still incomplete, gigantic inevitable famine stalks in the rear, and with one mighty blow levels the population with the food of the world.¹¹⁰

Malthus thus imagined the result of such a population explosion as a depraved bloodbath.

Unleashed within the framework of early capitalist empire building, “evil” reigns victorious over humanity’s ability to manage population levels.¹¹¹ Malthus implied that, at the climax of this progression from “depopulation” to “war of extermination” and then to “gigantic inevitable

famine,” overpopulation will threaten humanity with extinction. The number of dead would accumulate as vices, war, weather, and various types of diseases each kill tens of thousands. Malthus portrayed the most destructive positive check, famine, as capable of “completing” any mass death by providing the maximum number of bodies needed to recalibrate procreation with agriculture, a number well beyond tens of thousands. He extrapolated catastrophic population crises not with one primary cause of death, but with them all operating in concert at a magnitude theretofore unknown. This catastrophic climax was an abstraction in part as he did note that population would “level” after all of the death and destruction, but this image of war made the catastrophe sound much direr than normal, more specific population readjustments. Furthermore, because of the universality of the catastrophe’s cause, this accumulated disaster was both repeatable and plausible across the planet, capable of unleashing unheard of and improvable levels of speculative violence. A global overpopulation crisis could level the population at zero. He thus abstracted his “principle” by speculating global destruction on a scale he could not exemplify. Basing his generalizations on empirical fact would have meant the “end” had already come. “Gigantic famine” would already have leveled global population possibly to the brink of human survivability.

Toward the end of the second *Essay*, Malthus repeated a warning “that the general principles on these subjects ought not to be pushed too far.” Concerned citizens, that is, should not harm the poor for the sake of “remote consequence.”¹¹² But Malthus always pointed out the remote consequence, which tended to sound much more terrible than any misery arising from short-term population management. Malthusians therefore extrapolated a justification for brutal treatment of the poor from arguments that Malthus had made explicit in his treatises. Generalized

violence and war, as primary negative consequences of his “universal law,” appeared to be inevitable wherever people depended on sustenance, which was everywhere.

Therefore the way Malthus amplified local conflicts into a speculative global conflict implied that, as a correlate to war, weapons came to represent an amplified and universal threat as well. Paradoxically, weapons, by providing the means to check enemy populations, also came to represent a fortunate and beneficial way to recalibrate population with sustenance. The importance of amplified generalizations to weapons rhetoric and subsequent rhetorical confrontations with the Paradox derives from the way Malthus depicted the entire human race as imperiled. Malthus “proved” that the preservation of humanity would rely on the survival of catastrophic wars, and this generalization became a rhetorical commonplace that weapons rhetors could draw upon to argue that specific weapons could cause total world destruction or save it from annihilation. This imperiled collective fate became an undergirding rationalization for advocating and resisting weapons of mass destruction. Thus, Malthus’s amplification of warfare to the point of universal abstraction presented another way that he conceived the interplay of technology and population such that humanity cannot overcome the Paradox much less war.

“Machine” Antistasis

Malthus’s statistical and argumentative imprecision carried over to terminological imprecision. In a letter to James Mill, Ricardo attacked Malthus’s denial of political economy’s mathematical nature by citing Malthus’s imprecise terminology. According to Ricardo, Malthus “thinks he may use words in a vague way, sometimes attaching one meaning to them, sometimes another and quite different. No proposition can surely be more absurd.”¹¹³ Malthus was not unaware, however, of the importance of terminological precision, as demonstrated by his debates

and quibbles about the definitions of “glut” and “value” that ran throughout his correspondence with Ricardo. He even wrote an argumentative dictionary, *Definitions in Political Economy* (1827), to define economic terms then in common usage.¹¹⁴ With such abundant terminological contestation arising from the emerging field of political economy, Malthus’s use of the word “machine” constitutes another important element of Malthus’s rhetorical negotiation of the Paradox.

“Machine” in both its literal and metaphorical meanings functioned in his population theory as a type of antistasis, or “repetition of a word *in a different sense*” wherein each usage alludes to different connotations of the term.¹¹⁵ Malthus used a literal meaning of “machine” when he described the negative effects of “unwholesome” factory work on the poor, and he used a metaphorical meaning of “machine” to refer to the capitalistic functioning of government. Although he disparaged “unwholesome manufactures” in his most specific engagement with technological artifacts, his attitude toward industrial technology remained ambivalent as his overall assessment of machines became more positive. Malthus’s switching between literal and metaphorical “machines” revealed an undergirding logic of industrialization: despite the problems of unwholesome manufactures, redundant people, and weapons production, capitalism and its machines improved society, so they should be tweaked rather than overthrown. Machines, in the metaphorical sense of government and capitalism, made technology appear a boon, but when “machines” materialized Malthus’s abstract population theory in a non-metaphorical sense, “the machine” reified the paradoxes of technology.

Malthus used the machine metaphor in response to his rival, Godwin, so first understanding Godwin’s usage is essential to understanding Malthus’s iteration. By no means did Malthus or Godwin invent the mechanistic metaphor for government. It was a banal

commonplace. Perhaps the most famous prior example is Hobbes's. His depiction in *Leviathan* of an "artificial man" moved by engines, springs, and wheels condensed humanity, technology, and governance into one complex metaphor that drove his vision of monarchy.¹¹⁶ Hobbes, and other writers employing the same metaphor, can use the "machine" to examine a state either as a whole entity, or to examine a state by disassembling it into parts, thereby describing the efficient inner workings of government and any other non-mechanical process meant to appear effortless and beneficial. In Godwin's case, he elevated the advantageous status of the machine in his philosophical paradigm because the "machine" operated as both the "vehicle" and the "tenor" of his metaphor.¹¹⁷ As the vehicle, technology would support humanity's leisure by performing all of its toil and labor. As the tenor the "machine" connoted the smooth operation of a peaceful society based on universal liberation. Godwin rejected anti-technological attitudes as "uninformed and timid" as he described how to disassemble and reinvent the governmental mechanism. He wrote, "The progress of science and intellectual cultivation, in some degree, resembles the taking to pieces a disordered machine, with a purpose, by reconstructing it, of enhancing its value."¹¹⁸ Godwin's machine metaphor for government was less vexed by dichotomous meanings than Malthus's. The completed anarchist machine fashioned from "the confused heap of pins and wheels that are laid aside at random" from the dismantled government would run with precision like a machine and with machines.¹¹⁹ Machines both worked in Godwin's utopia and symbolized how utopias will work as a society, and hence the metaphor complemented his politics.

Despite his political and technological disagreements with Godwin, Malthus used the machine metaphor for government without compunction. To question Godwin's "main spring" of government (benevolence), Malthus proposed disassembling the British government into parts to contemplate reforms that might strike a balance between population and sustenance.

According to Malthus, “a society constituted according to the most beautiful form that imagination can conceive, with benevolence for its moving principle” will always revert back to an economic class system “with self-love the main-spring of the great machine.”¹²⁰ The anarchist “main spring” would malfunction; benevolence would breakdown within Godwin’s political machine, wrecking it. Malthus therefore argued that rather than making order out of disorder, benevolence would make disorder out of order. A “main-spring of self love” may cause problems, but it would not break the entire government like, in Malthus’s estimation, benevolence would.

If the design fails, society must retool the mechanism. For Godwin, this entailed a complete disassembly and reassembly to the point of eliminating the state altogether to keep only its “main-spring” in operation. For Malthus, the “main-spring,” or “self-love,” of the capitalistic “great machine” must be retained.¹²¹ In the second *Essay*, the basic design of the machine remained intact. Malthus wrote, “The structure of society, in its great features, will probably always remain unchanged. We have every reason to believe that it will always consist of a class of proprietors and a class of labourers; but the condition of each, and the proportion which they bear to each other, may be so altered as greatly to improve the harmony and beauty of the whole.”¹²² In addition to demonstrating his political moderate-conservatism, this passage provides an alternative prospect for redundant populations. With proper management on governmental and scientific levels, as well as proper self-management on the moral level, redundant populations could be eliminated not through destruction, but by personal inhibition and prevention. This combination of techniques could save the masses from living in misery, and thereby save the state as well. Individualism is thus inherent to maintaining the “great machine” of industrial capitalism.

The metaphorical use of “machine” depicted industrial capitalism as a preservative force, both for individuals and society. Industrial capitalism provided, according to Malthus, two important benefits to the entire British population – greater civil liberty for the individual and greater wealth and productivity for the state. Upon the introduction of new factory machines, “liberty came in their train.”¹²³ However, liberty was not power for the poor, but for the state. Malthus made the benefits of machinery to the state economy most clear in *Principles of Political Economy* where he wrote “Like the fertility of land, the production of good machinery confers a prodigious power of production.”¹²⁴ Producing more liberty and wealth for the middle and upper classes, meant the working classes engaged in “unwholesome manufactures.” The working classes “improved” only in the sense that they, more and more, worked the dangerous occupations that garnered wealth for the owning class and stabilized the government by consolidating economic power. Liberty, for workers, entailed their capacity to exchange their labor for wages, rather than expecting entitlements, which may or may not come, from landed gentry and the government. As a devotee of Adam Smith, Malthus equated the freedom of the poor with the greater freedom of markets. And the poor were each free to turn the “main spring” with their “self-love,” but they remained powerless to do much else within the “great machine’s” economy. The machine metaphor simplified the complex predicament of the poor in relationship to the state, because it construed everybody, from the most destitute pauper to the wealthiest capitalist, as economically free individuals who could alter their situation by turning the “self-love mainspring” of capitalism.

A few pages after his metaphorical use of “machine,” Malthus used the term in its literal sense. Wondering what ancient Greeks would think of watches and telescopes, Malthus conceded that humans possess a high level of technological ingenuity. But, he did not observe

any machinery that indicated technology would soon, or ever, free humanity from toil, misery, and population checks. In fact, the effects of machines were unknown. He wrote:

Persons almost entirely unacquainted with powers of a machine cannot be expected to guess at its effects. I am far from saying, that we are at present by any means fully acquainted with the powers of the human mind; but we certainly know more of this instrument than was known four thousand years ago; and therefore, though not to be called competent judges, we are certainly much better able than savages to say what is, or is not, within its grasp.¹²⁵

Observation of industrial capitalism's machinery granted Malthus and his contemporaries a certain level of insight into the "powers of a machine" and its "effects." But his judgment of "machines" was conflicted. The "great machine" represented the ideal form of governing power. But, destructive effects of literal machines were blatant and far from ideal. In comparison to the "great machine," the actual mechanical devices in factories were, for workers, not-so-great machines. Malthus did not need to "guess at its effects" on the working poor, because they were obvious.

Malthus bemoaned the destructive elements of British industrialization in the first *Essay*, and noted that capitalism's "great towns and manufactories" were home to "unwholesome occupations," "severe labour," and inadequate housing, all of which demonstrated the deleterious "powers of machines" as well as the failure of the "great machine" to alleviate them.¹²⁶ In the second *Essay*, Malthus quoted "Dr. Aikin's Description of the Country Round Manchester" to depict the degradation caused by new manufacturing techniques. In order to describe the providential "inconvenience" of the expanding cotton industry, Aikin reported that the cotton mills rounded up child laborers "of a very tender age" from far-flung urban workhouses to work long hours spinning: "The air they breathe from the oil, &c., employed in the machinery...is injurious; little attention is paid to their cleanliness; and frequent changes from a warm and dense to a cold and thin atmosphere are predisposing causes to sickness and debility, and particularly to

the epidemic fever which is so generally to be met with in these factories.”¹²⁷ Factories and new machinery cast already poor people into worse destitution, ruined their health, and otherwise brought on their early demise by cultivating vice and misery in manufacturing centers. The cotton industry’s new spinning and ginning machinery thus exemplified how new technology born of industrialization introduced simultaneous state wealth production and human destruction. They increased the possibility of consumption and empowered employers to replace adult workers with children to run the machines.¹²⁸ Despite bearing witness to these “powers of the machine,” Malthus remained committed to the belief that manufacturing, capitalism, the government, and technology could be reformed to alleviate the misery of the working and unemployed poor.¹²⁹

Thus, what makes Malthus’s iteration of “machine” remarkable for weapons rhetoric is the way antistasis linked the preservative and destructive aspects of technology in one banal word. Rhetorical scholars I. A. Richards and Ron Greene have criticized similar machine metaphors, arguing that they cause misunderstanding and oversimplification. But in Malthus’s population theory, the way the machine metaphor exposed technology’s paradox shows that mechanistic metaphors function in a more complex way.¹³⁰ In Malthus’s case, his “machine” antistasis expressed the complex material and ideological functions of technology in one word, which thereby expressed the fundamental paradox of technology. While new technologies contributed to the preservative powers of industrial capitalism, individual machines ruined lives, families, and cities, as well as they fomented class violence. Alienation of the workers was “within the grasp” of the “powers of the machines” as Britain expanded factory production.

Malthus’s choice to maintain the machine metaphor to describe the design of states, coupled with his refusal to grant that technology is powerful enough to undergird such a society

without causing widespread misery shows his ambivalent opinion of machinery. His choice of the metaphor may have been casual, but the instability of meaning that “machine” created in the *Essay* reified both the creative and destructive characteristics of machinery. While factories and state work houses threatened paupers with destruction, the strengthening of capitalism with technology caused the bourgeois to burgeon and manufactured an unprecedented growth in national wealth. Although antithetical to his conceptualization of machinery’s actual (as opposed to utopian) relationship to governance, the “machine” does reflect the complicated and difficult deliberations that Malthus considered when he made the ethical decision to oppose reformation of the Poor Laws.

Malthus’s use of the word “machine” also reveals another way that his work functions as an important pre-text for understanding the development of weapons rhetoric. The metaphorical and literal switching between different meanings of “machine” did not promote misunderstanding per se. Rather they granted insight into the conundrum of whether the biggest “machines” were advantageous or disadvantageous. They were both at the same time; machines both helped to constitute the working poor’s existence and threatened that existence with destruction.

In turn, Malthus’s machine antistasis has more specific importance for understanding the development of weapons rhetoric. Although for Malthus the “big” machine was the entire governing apparatus, the instability of his usage of “machine” framed individual mechanical artifacts as possessing an ominous power over people. And with the further popularization and circulation of the machine metaphor it became commonplace that one machine could both preserve and annihilate rival populations, if not all humanity. Rhetors could refer to the existence of one “machine” as proof of the ultimate preservative and destructive powers of technology.

19th Century Logics of Preservation and Destruction

The rhetorical tactics Malthus used to negotiate the Paradox—the mathematical sublime, amplified generalizations, and machine antistasis—integrated the increasing magnitude of technological activity with a complimentary rhetorical magnitude. Thereby his population theory helped to update the language of weapons, war, and politics to accommodate increasing populations, technological change, and bloodshed. Hence his rhetoric meshed well with contemporaneous rationalizations of war and weapons; it disseminated the concept that technology might be poised to affect the entire global population with catastrophic results at a time when industrialization seemed capable of delivering such a device. For this reason, Malthus’s expression of his population theory helps to make sense of some conceptually compatible military, industrial, and scientific logics that emerged from the first half of the 19th century that also sought to rationalize the preservation and annihilation of larger and larger populations.

In that era, military strategy adapted to use all elements of larger populations for war, a process well-exemplified by the *Levée en Masse* that aimed for total mobilization of France’s citizenry. As enemy populations strove to “exterminate” each other in both internal and foreign wars, and as more and more massive armies armed with new weaponry caused increasing destruction, a nascent concept of total war that called for complete annihilation began fomenting. Even evolutionary theory and its promulgation of the “survival of the fittest” attitude depended on Malthusian arguments. Malthus’s negotiation of the Paradox thus further makes an apropos pre-text with which to begin assessing the modern history of weapons rhetoric, because his population theory corroborated these concepts of industrialized warfare that further made a link

between technology and speculative global human extinction. Along with Malthus's "principle of population," these concepts extended the human, technological, geographical, and conceptual scope of war.

Malthus recognized the usefulness of hungry, jobless people to military conscription, but he somewhat underestimated their newfound importance. In the second *Essay*, Malthus depicted how the powerless statistical fringes of overpopulated societies could get harvested to die in war. He wrote, "The ambition of princes would want instruments of destruction, if the distresses of the lower classes did not drive them under their standards. A recruiting serjeant always prays for a bad harvest and a want of employment, or, in other words, a redundant population."¹³¹

According to this view, weapons innovation and procurement mattered less to military commanders than securing enough bodies to fight. Population growth empowered ruling bodies to wage war and "made wars more possible" for the simple reason that there were more bodies to die.¹³² In short, historian John Aberth noted that, "more infantry meant more violence for a number of reasons," mainly their cheaper-than-cavalry maintenance and their expendability as superfluous commoners.¹³³ Malthus argued that *too* great a population increase, though, would hamper the state's ability to wage war because too many redundant people would divert economic and military resources to welfare and controlling internal tumult.¹³⁴ Malthus also thought that wartime destruction was "abating."¹³⁵ But, Malthus did not foresee that weapons and strategy would adapt to killing the larger and larger numbers of people who became redundant to state economies early in the 19th century and then throughout the 20th century. Nevertheless, with weaponry and standing armies increasing at a pace closer to Malthus's geometrical rate than his arithmetical rate, the context of the French Revolution and Napoleonic Wars lent another level of contextual credence to Malthus's generalization that terrible violence

would erupt from global population growth. On a smaller scale, Malthus wrote in the second *Essay* that the “object” of Native American wars was “not conquest but destruction,” because the “life of the victor depends on the death of his enemy.”¹³⁶ On the globalized level, this logic would justify unheard of destruction. Thus, Malthus’s importance to 19th century military strategy derived from the generalization – to the “whole earth” – of the Malthusian rationalization that demanded that enemy populations be driven to the point of “utter extinction” in order to preserve the biological survival of the victors.

Enlarging the scope of warfare to incorporate so many soldiers meant greater interdependence of industrial production, armaments, and citizens. Armies needed to procure more weapons, both in number and in power. As a correlation, the population explosion and the necessity to kill larger enemy armies empowered the increased mass production of weapons by providing more factory workers to manufacture them, and the expansion of standing armies by providing cannon fodder. In a circular fashion, the necessity of arming such large armies helped to fuel the expansion of weapons industries, which fueled more employment and procreation. Historian William H. McNeill used a machine metaphor to describe the transformation of soldiery as armies began using mass-produced weapons, “Soldiers...tended to become replaceable parts of a great military machine just as much as their weaponry.”¹³⁷ War thus threatened redundant populations by increasing the likelihood of both their employment in dangerous industries and their death on the battlefield.¹³⁸ Furthermore, a war can kill off a redundant population, or create one, if it ends before enough people die. For instance, when Britain’s army demobilized after the Napoleonic Wars, it caused an unemployment crisis because the army employed about four percent of the state’s entire workforce.¹³⁹ Returning soldiers put a strain on the economy as they searched for work, and thereby created statistical

redundancy, since the home population, supported by the boons of capitalism, had increased.¹⁴⁰ Even massive wars, however, did not relieve the pressures of overpopulation as they fostered industrial expansion and did not preclude agricultural innovation and procreation.¹⁴¹ Weaponry and armies thus kept increasing in magnitude apace with the expanding scale of industrialization and general populations.

France's *Levée en Masse*, its innovations in weapons mass-production, the attempted extermination of everyone living in the Vendée region, and the scale of French aggression from the revolution through the Napoleonic Wars exemplified the adaption of military strategy to population growth and industrial expansion. A literal Malthusian "total war" would implicate every person in a conflict over basic sustenance. In fact, Malthus stated as much in *A Summary View of the Principle of Population* when he reflected that "from 1795 to 1820, the greatest part of which time Europe was involved in a most extensive scene of warfare requiring all its population."¹⁴² The *Levée en Masse* of 1793 marked a signature moment, because it, in theory, attempted to accomplish this feat on a national level by mobilizing the entire French population (30 million citizens). Before the *Levée*, for the most part, typical citizens were not targets of violence.¹⁴³ But according to Edmund Dubois-Crancé's 1789 dictum that "In France every citizen must be a soldier, and every soldier must be a citizen, or we will never have a constitution," the *Levée* legislated universal militarization. It decreed that "all Frenchmen," including women, children, and old men, "are permanently requisitioned for service into the armies," to either fight or provide logistic support.¹⁴⁴

The *Levée* remained more an ideal theory than an actual plan, but no other country rivaled France in its weapons production and its army's size.¹⁴⁵ Armed by a gunpowder factory that produced 30,000 pounds a day, and a rifle industry that produced 750 a day, the French army

– an unprecedented 750,000 strong – could swarm anywhere in Europe like none prior.¹⁴⁶

Without the *Levée* and a growing population (through procreation and annexation) to send into battle, perhaps the Revolution and the subsequent wars of aggression could not have been fought with such ferocity. The *Levée* meant that not only would all French citizens become citizen-soldiers, but by extension so would all foreign citizens and any other population deemed an enemy of France.¹⁴⁷ With France as their enemies, Britain, Austria, and Germany appeared compelled to build rival armies of comparable strength, which resulted in legislation similar to the *Levée*, such as the 1808 Austrian *Landwehr* that mobilized all men from 18 to 45 years old, the comparable East Prussian *Landwehr* of 1813 and its complementary *Landsturm*, which mobilized “every citizen” to resist invading armies, as well as a massive expansion of the British standing army.¹⁴⁸ As if to justify such universal military expansion, population growth meant that more and more people were alive to die in war, and die they did. After the *Levée*, all of Europe became a probable site of military destruction, and all Europeans became enemies of foreign states. 19th century colonial expansion took the threat around the world.

With the distinction between soldier and citizen erased, strategy adapted to encompass killing enemy civilians. Pierre-Victor Malouet said in 1790 that, “There has been in this Revolution a character that belongs to no other: to generalize its principles, to make them applicable to all peoples, all countries, all governments.”¹⁴⁹ Beyond the principle of political liberty, however, the revolution seemed to generalize the principle of extermination, as exemplified by the destruction of the Vendée in retaliation for its counterrevolutionary resistance. The atrocities committed by French revolutionary forces in the Vendée materialized the Revolution’s exterministic rhetoric and served as a microcosmic example of the level of violence that could occur on a global scale, at least according to the universal warfare Malthus

predicted.¹⁵⁰ Liberty came at the price of blood. While the guillotine fell with regularity in Paris, in the Vendée, troops were ordered to kill everyone and everything to quell resistance. Georges Danton spoke of the “exterminating angel of liberty,” and “in the Vendée, the rhetoric of total war was fully translated into blood-streaked, exterminatory fact.”¹⁵¹ “War is declared upon all the oppressors of the world,” said Charles-Philippe Ronsin in 1791. Also in 1791, Jacques-François Menou said “All the nations of Europe must learn that if ever we are forced to make war...it will be a war to the death...We will fight to destroy or annihilate those who have attacked us, or to be destroyed ourselves.”¹⁵² Anacharsis Cloots stated, “The French, like lions, will defend themselves in such a way as to leave not a single man alive, not a single tree standing...The land of France may be enslaved, but we will perish as free men, with our wives, our children and our cattle. So! Princes of Germany, monarchs of the north and south, there you will be bathing in the blood of an exterminated nation.”¹⁵³ The revolutionary French Assembly saw the stakes as total, and it “took an oath to die.”¹⁵⁴ “Through its amplitude, through its incessant repetition of its images of death, martyrdom, and extermination,” according to historian David A. Bell’s analysis, such “propaganda drove home a set of simple but potentially transformative ideas.”¹⁵⁵ Bell concluded that these threats were not hyperbolic, but meant as earnest statements about the level of violence these politicians expected their armies and civilians to achieve.¹⁵⁶ The level of violence perpetrated at the Vendée provided proof of their intentions: 25% of its residents died (between 220,000 to 250,000 people). Enemy states could expect to fall victim to the same level of violence, or worse, than that of the Vendée. French troops proceeded to massacre enemies in Cairo, Jaffa, Haiti, and throughout Spain.¹⁵⁷ This complementary exterministic military strategy and rhetoric, like Malthus’s population theory, helped to generalize exterminism as a global principle.¹⁵⁸

Thanks to the French Revolution, the threat of similar upheaval in Britain, and outbreaks of machine breaking, a spirit of class-based violence surrounded the publication of the *Essay* and its later editions.¹⁵⁹ Revolutionary conflict and degraded subservience to industrial capitalism's factory machinery, which fomented revolutionary tendencies in the first place, confronted the "redundant population" with an unappealing choice between aggression and acquiescence. In a letter to Ricardo in 1819, Malthus asserted that a British revolution would be much more violent than France's, and the "massacre would in my opinion go on till it was stopt by a military despotism."¹⁶⁰ Some workers, such as the Luddites, rebelled by destroying the machines that replaced them in factories, and others, such as the journalists of the "Pauper Press," the radical working class journalism that flourished in the 1820s and 1830s, sought to compel the revolutionary massacre that Malthus imagined. The Luddite rebellion began in March 1811. Workers smashed the cotton machinery that had stolen their jobs, transformed their communities, and served as symbolic harbingers of widespread capitalist oppression.¹⁶¹ The British government responded, in turn, with the Frame Breaking Act of 1812 that made machine breaking punishable by death. Toward the end of Malthus's life, The Pauper Press denounced Poor Law reformation, and promised "all-out war" in 1832. The loose collection of workers' papers provided advice on the utilization of military technologies and tactics such as "street fighting, the use of small arms and ammunition, the effectiveness of moveable barricades, and the manufacture of explosives, combustibles and burning acids."¹⁶² A year after the 1834 Poor Law reforms, James O'Brien, the "nonviolent" editor of *The Poor Man's Guardian* wrote, "We had rather see our countrymen up to their ears in blood, than see them die by inches, the despised outcast victims of your cannibal legislation."¹⁶³ The exterministic rhetoric that flourished in revolutionary France had crossed the Channel.

The growing scale of warfare in the early nineteenth century thus put new kinds of pressure on conceptions of “redundant populations.” The killing – both speculative and real – in the era that witnessed Malthus’s generalizations about global warfare, population growth, the militarization of citizens, widespread class conflict, exterministic rhetoric, and the strategic extermination of peoples in America, Europe, and elsewhere, could not culminate until conflicts approached becoming “total war.” The term “total war” did not originate until late in WWI, but it developed from the ways that strategy adapted to bring all of these generalized concepts together as an abstract military goal in the 19th century.¹⁶⁴ In total war, defeating an enemy state requires destroying its military capability, its economy, its citizens, and any other contributing factor to state power. As precursor to total war theory, Carl von Clausewitz extrapolated the concept of “absolute war” from his observations of the Napoleonic Wars. Clausewitz saw Bonaparte unleash the “unlimited degree of energy” of “the pure element of enmity unleashed,” “total ruin,” and “devastating power” waged on “a scale that up to then had been inconceivable,” all of which made Clausewitz recognize the “absurdity” of restraint in combat.¹⁶⁵ Rather than providing a limiting principle, in “absolute war” “all limits disappeared in the vigor and enthusiasm shown by governments and their subjects.”¹⁶⁶ Bonaparte projected this attitude: “A man like me does not give a shit about the lives of a million men,” he said of the unprecedented death and destruction he oversaw.¹⁶⁷ Despite such vitriolic rhetoric and the atrocities of the Napoleonic wars, the level of destruction committed by French forces seldom reached the ideal of extermination.¹⁶⁸ Nevertheless, Malthus’s generalizations about the disastrous results of overpopulation provided a rationalization for aiming to exterminate enemies as a point of order to avert the Malthusian threat. Because Malthusian logic deemed extermination justifiable when

a population lacked any other technological means to subsist, governments transformed this justification into a strategy to promote state preservation rather than life preservation.

The problems of biological survival that confronted humanity with total war also inspired the evolutionary theories of Charles Darwin and Alfred Russell Wallace, who both used Malthusian inductive generalizations to argue that the history of specific species' populations proved survival behaviors and tendencies for the entire biological world.¹⁶⁹ For instance in Darwin's notebooks, the biologist quoted Malthus that "the causes of population & depopulation have been about as constant as any of the laws of nature with which we are acquainted." – This applies to one species – I would apply it not only to population & depopulation, but extermination and production of new forms."¹⁷⁰ In this scientific iteration of Malthusianism, the combination of Malthus's generalizations about humanity's ultimate doom and the apparent universality of his population theory revealed the natural law that extermination to the point of extinction is inherent to survival of not only people but all species. Evolutionary theory thus appears to be a generalization of a generalization, and Darwin's and Wallace's use of Malthus's universal population principle as the basis of biological evolution re-conceptualized the "principle of population" as the determinant factor that guides human behavior.¹⁷¹ Darwin's analyses of animal species exterminating other animal species elucidated how extinction and survival depended on a species' battle with each other over limited resources. Darwin's generalization of Malthusian principles validated Malthus's generalization about wars caused by overpopulation. And because Malthusianism derived from observations about Homo sapiens, the most obvious endangered species was humankind.

The later development of social Darwinism and the "survival of the fittest" rationale indicates how Malthusian generalizations about the fate of humanity radiated outward to

influence political rationalizations for innovating, adopting, and deploying more and more powerful weapons. Not only did Malthus bring attention to a universal population principle, but he also implied that humanity may face its ultimate destruction in scenarios where specific weapons help to determine the outcomes of wars in a suddenly overpopulated world.

Technology, by preserving too many people from death, ushered in annihilation. Proof of his universal principle required the assumption that people's aptitude for killing outweighed their aptitude for farming. Malthus theorized global overpopulation and global war at a time when industrialization, population growth, technological innovation, and warfare of all kinds seemed on the cusp of either materializing exterministic rhetoric or transcending these problems to preserve humanity, and therefore his population theory helped to elucidate far-reaching ramifications of how populations imagine their survival.

Conclusion

Malthus, transformed into Malthusianism, thus did not disappear from debates about how to use technology to manage large populations both at home and in enemy states. Meanwhile, the technological threat to humanity and the impetus to save humanity from the brink of disaster increased after his death. The Malthusian Paradox became even more entrenched as more powerful weapons made concern about human preservation in the face of possible annihilation endemic. As armies and individuals developed their technological power to kill, they also developed their justifications for violence along Malthusian lines. No longer alive to contest his *Essay's* appropriation, Malthus's name was invoked to justify brutal aggression against poor people and enemies rather than calling for measures to alleviate poverty and conflict. The goal of maintaining a sustainable population legitimated the rhetoric of "extermination" as typical goals

for both states and revolutionaries. According to Ronald L. Meek's scathing attack on Malthus, "Malthusian doctrines, in their present day forms, are encouraging preparations for war, and reducing opposition to the actual waging of war...After all, the advocacy of infanticide or the cessation of medical supplies to 'overpopulated' countries is not very far from the advocacy of more widespread and efficient measures to reduce the population."¹⁷² Meek's accusation that Malthusian arguments rationalized pernicious policies is correct. After Malthus empowered them with a forceful ideology, political actors, soldiers, engineers, and scientists could use the anxiety derived from overpopulation's speculative implications to justify extermination for the sake of saving one's own multitude.

So, if "It must be acknowledged that bad theories are very bad things, and the authors of them useless and sometimes pernicious members of society," then judging Malthus becomes difficult. By naming overpopulation as a primary technological threat to humanity and by forcing humanity to confront it, he can be faulted for empowering annihilation while at the same time commended for warning us and bringing the predicament to everyone's attention. He confronted humanity with the basic problem that construction is the source of destruction and destruction the source of construction. The Malthusian Paradox is thus a moral and psychological dilemma as much as it is a technological, political, and rhetorical dilemma. In the moral iteration, "It seems highly probable that moral evil is absolutely necessary to the production of moral excellence."¹⁷³ And in the psychological iteration, Malthus conceded that while the *Essay* cultivated a gloomy outlook for humanity, he was "subservient to the important end, of bringing a subject so nearly connected with the happiness of society into more general notice."¹⁷⁴ Regardless of whether Malthus is judged in retrospect as pernicious or laudable, or his principle judged as good or evil,

in order to promote happiness, society has had to reflect on gloomy and unpalatable plans to control the balance between procreation and agriculture.

Of course, Malthus's most dire predictions never came to pass, but the Paradox became more difficult for weapons rhetors to ignore. While population growth combined with environmental degradation has spurred much aggression in the years since his death, the image he predicted of a viscous global war for scarce resources in an overpopulated world did not materialize. With "universal conscription" at his service, Napoleon did not arm, supply, and transport his armies to the extent that technology could have empowered.¹⁷⁵ Later, the American Civil War demonstrated the amount of destruction that an increased application of technology to killing could cause, as would the full integration of military purpose with technology in World War I.¹⁷⁶ During this period, industrialized technology impacted tactics and strategy, increased the speed and ease of communicating over vast distances, equipped large and larger armies with weapons with the result that "the civilian was now responsible for providing the industrial means of war."¹⁷⁷ The ideal form of total war failed to materialize as well, but the scale of destruction increased nonetheless, even though the two ensuing "world wars" and Stalinism came as close to fulfilling his prediction as any other conflicts. "Redundant populations" did live under a permanent threat as much as they persevered. Amplified generalizations and bloodshed continued to circle around each other, even though the magnitude of destruction seldom matched the magnitude of the rhetoric used to describe it.

Just as Malthusianism has an ongoing history, so do Malthus's rhetorical tactics. Malthus showed that it is quite difficult to address the fate of the global population without confronting the Paradox and its basic pitting of technological preservation versus technological annihilation. As a pre-text, Malthus's "principle of population" shows how his rhetorical tactics derived, in

part, from contemporary debates about overpopulation and political economy, and then proliferated, transformed, and accompanied new rhetorical strategies used to debate new weapons. The pre-text was not a rigid frame that determined how weapons rhetors had to speak and write about weapons. Rather, it circulated a few rhetorical tactics and technological concepts that later rhetors could take up for their own inventions – tactics that meshed well both with the Malthusian ideologies and anxieties that framed the commonplace wisdom that the fate of all humanity is technologically dependant on the presence of WMDs.

Because new mass-produced weapons in the late 19th century began to catch up to and bring presence to the idea of global destruction, the following case studies demonstrate how weapons rhetors drew from commonplace Malthusian rhetorical tactics for navigating the Paradox as well as how they devised their own tactics to negotiate it. Somewhat similar to Malthus’s terminological inconsistency regarding the “machine,” August Spies used the instability of the term “dynamite” to imbue the weapon with vast power. Similar to Malthus’s use of statistics to prove the universality of his population theory, Amos A. Fries and Clarence J. West used statistical proofs to demonstrate the “universality” of chemical warfare. And like Malthus used increasing levels of amplification to generalize about war, Fries and West used increasing levels of amplification to indicate mustard gas’s destructive power. Spies, Fries and West, and Szilard all granted the weapon-of-the-moment a “global” power of destruction. That sublime statistics, universal generalizations, and antistasis have not disappeared from the language used to advocate, resist, and debate dangerous technologies indicates Malthus’s importance for understanding how the Paradox and weapons rhetoric interact. Thus, the framing of current political, critical, and popular reactions to overpopulation in terms of humanity’s technological ingenuity to stave off extinction is a crucial element of Malthus’s rhetorical legacy.

³⁹ Malthus, second *Essay*, 312. To follow the abundant trend in Malthus scholarship, I refer to the 1798 edition as the “first *Essay*,” and I refer to the 1803 and subsequent editions as the “second *Essay*.” The reason for the distinction between the 1798 and latter editions rests on Malthus’s almost complete revision of the first edition in 1803 when he excised the majority of the original text, revised what he retained, and added hundreds of pages of additional evidence. Less substantial revisions appeared in 1806, 1807, 1817, and 1826. His brief final statement on the subject, *A Summary View of the Principle of Population*, was a shortened version of an entry on population he wrote for *Encyclopedia Britannica*, in 1830. Unless otherwise noted, my citations of the first *Essay* come from: Thomas Malthus, *An Essay on the Principle of Population and a Summary View of the Principle of Population*, (New York: Penguin, 1970); and my citations from the second *Essay* come from Donald Winch’s critical compiled edition of the *Essay*’s latter editions: T. R. Malthus, *An Essay on the Principle of Population; or A View of its past and present Effects on Human Happiness; With an Inquiry into our Prospects respecting the future Removal or Mitigation of the Evils which it occasions*, ed. D. Winch, (New York: Cambridge University Press, 1992).

⁴⁰ Many scholars of Malthus and Malthusianism have traced the public and private arguments about overpopulation, policies, and economics, and depending upon these authors’ foci, they foreground Malthus’s interactions with differing varieties of his critics. An extensive, but not complete, bibliography of contemporary responses to Malthus by other famous period writers, like William Godwin, William Cobbett, and William Hazlitt, can be found in D. V. Glass, *Introduction to Malthus*, 79-112. For a review of the principle criticisms of Malthus, see Avery, *Progress, Poverty and Population*; H. L. Beales, “The Historical Context of the *Essay* on Population,” in Glass, *Introduction to Malthus*, 1-24; Bonar, *Malthus and His Work*, 355-398; Meek, ed., *Marx and Engels on the Population Bomb*; Petersen, “Malthus and the Intellectuals”; and Smith, *The Malthusian Controversy*, 47-206.

⁴¹ Bonar, *Malthus and His Work*, 1.

⁴² In *Pre-Malthusian Doctrines of Population*, Charles Emil Stangeland reported the success of the *Essay*’s arguments prior to Malthus’s iteration of them: “From about the middle of the eighteenth century to the time of Malthus, the modern, so-called ‘Malthusian,’ doctrine, that population tends to increase more rapidly than the food supply, found almost universal acceptance;—among French writers, by Montesquieu, Brückner and others, beside the Physiocrats and political philosophical writers generally; in England and America in the works of Franklin, Hume, Wallace, Steuart, Smith, Paley, Chalmers and others; in Germany in the discussions of Möser, Schloezer and Herrenschwand, especially; and among the Italian writers quite generally” (353-354). Ricardo, his friend and rival, argued with Malthus about many economic points, but conceded the “principle of population.” But among many attacks on Malthus, one of the most common holds that Malthus plagiarized this theory. Malthus admitted his intellectual debt to previous writers who examined overpopulation, especially William Paley and Adam Smith.

⁴³ Hasian, “Legal Argumentation in the Godwin-Malthus Debates,” 194. Arthur E. Walzer posited a different view of the *Essay*, arguing that its rhetorical importance derived from Malthus’s use of Newton’s *Principia* as an organizing structure. “Logic and Rhetoric in Malthus’s ‘Essay on the principle of population,’ 1798.”

⁴⁴ Digby, “Malthus and Reform of the Poor Law,” 104.

⁴⁵ The Committee’s “*Third Report* spoke of the empirical testimony of other witnesses having ‘been confirmed in the most absolute manner by that of Mr. Malthus,’ and advocated emigration as a means of reducing redundant labour and decreasing pauperism.” Digby, “Malthus and Reform of the Poor Law,” 104. The Committee also recognized the destructive aspects of technology upon the poor. In part, the *Third Report of the Emigration Committee* reported that the government should facilitate emigration because, “in the United Kingdom there had been a ‘redundant population,’ in Ireland agricultural, in Scotland and England manufacturing; that one cause of it had been the unavoidable displacement of labour by machinery...” Bonar, *Malthus and His Work*, 145.

⁴⁶ Bonar, *Malthus and His Work*, 304-305 and 317. Although Malthus did not have a direct hand in enacting the 1834 legislation, numerous Malthus scholars have observed his influence on the bill. Bishop Otter and Samuel Whitbread both noted Malthus’s impact on the Poor Law debates. Smith, *The Malthusian Controversy*, 296. Bonar claimed that “Malthus is the father not only of the new Poor Law, but of all our latter day societies for the organization of charity,” and that the controversial discourse that surrounded the *Essay* altered public opinion to make passage of the 1834 Poor Law possible (174). James P. Huzel, provided a review of secondary sources that tout Malthus’s “paramount influence in the creation of the New Poor Law of 1834.” *The Popularization of Malthus in Early Nineteenth Century England*, 3. According to Larry Patriquin, “There can be no doubt that the period 1795 to the 1830s was marked by a profound ideological shift, and that Malthus was the driving force behind this change.” *Agrarian Capitalism and Poor Relief in England, 1500-1860*, 15. Historian of political economy Anne Digby concluded in “Malthus and Reform of the English Poor Law” that, “The abrasive class character of the new Poor Law was thus rooted in the moral sentiments of Malthus” (167). Also see Ronald L. Meek’s introduction to *Marx and Engels on the Population Bomb*, 8.

Lorie Charlesworth took the opposite position, arguing Malthus had little effect on Poor Law reformation, stating “the case for describing the 1834 reforms as Malthusian is weak, his views were largely abolitionist and the Poor Law Commission in 1834 rejected his position taking a positivist route to reform.” She named Jeremy Bentham as more influential in *Welfare’s Forgotten Past*, 14. Anthony Brundage named both Malthus and Bentham as the primary intellectual influences on the 1834 Poor Law in *The English Poor Laws*, 32-36, 40, 45-48, and 54. Digby has noted that several notable Malthus scholars (Patriacia Jeams, J. R. Poynter, and William Petersen) argued that Malthus had a limited influence on the Law. “Malthus and Reform of the Poor Law,” 105.

Digby parsed what was and was not Malthusian about the 1834 Poor Law: it was not Malthusian in its provision of emigration subsidies, the increased complexity of Poor Law bureaucracy, and “its failure to take radical measures to abolish poor relief. It was Malthusian if the Law is considered a step toward eventual abolition, in addition to containing checks to population growth that included the penalization of unwed mothers, the separation of sexes in work houses, the ending of “outdoor allowances.” “Malthus and Reform of the Poor Law, 105-106.

⁴⁷ Brundage, *The English Poor Laws*, 12 and 79-81.

⁴⁸ Malthus’s second *Essay* included this critique of history and advocated a method of population study rooted in statistical inquiry (26-27).

⁴⁹ J. J. Spengler addressed, in brief, the impact of the concept of perpetual technological “progress” on Malthus’s formulation of the “principle of population.” “Malthus’s Total Population Theory,” 58-61.

⁵⁰ Malthusianism has influenced recent writing scholarship across a variety of disciplines from policy analysis to science fiction. A representative recent study of the population question prepared by the Worldwatch Institute, *Beyond Malthus: Nineteen Dimensions of the Population Challenge* (1999), by Lester R. Brown, Gary Gardner, and Brian Halweil, described a wide range of catastrophic problems, all of which technology enables, props up, exacerbates, and must solve, such as renewable energy, energy efficiency, recycling, and forest and soil management. As a typical example of the Malthusian Paradox, the book claims that technology will save humanity from overpopulation crises caused by technology in the first place. Robert M. Young reiterated the Worldwatch Institute’s technological solutions in “Malthus on Man,” 85, as did John Avery in *Progress, Poverty and Population*, 115. Eric B. Ross examined how Malthusianism helped to justify capitalist hegemony over the poor from English colonialism to post-Cold War globalization in *The Malthus Factor*. Matthew Connelly argued that Malthusian population control is, although still quite influential, coming to an end to probably be replaced by genetic control of populations in *Fatal Misconception*. Alan Macfarlane examined how demographic knowledge helped England and Japan break out of the “Malthusian trap” of war, famine, and disease to spur economic development in *The Savage Wars of Peace*. Mohan Rao argued that attention paid to Malthusianism and neo-Malthusianism by managers of India’s public reproductive and health care created ineffective, if not dangerous, policies in *From Population Control to Reproductive Health*. William D. Sunderlin argued that three strands of Malthusianism affect environmental policy making: from the left, class-based anti-Malthusianism calls for poverty alleviation; from the middle, moderate neo-Malthusianism calls for prudent population management, and from the right anti-Malthusian makes moralistic objections to population management in *Ideology, Social Theory, and the Environment*. For a brief overview of Malthusian science fiction dystopias see Brian Stableford, “Man-Made Catastrophes,” 127-129.

⁵¹ As Kenneth Smith noted in *The Malthusian Controversy*, if his critics “attack views which Malthus did not enunciate, but which were deduced with or without his consent from his work, this is quite a legitimate undertaking . . . What men thought Malthus said was as important in the eyes of his critics as the very things he did say” (48). According to Jacques Dupâquier, participants at the 1980 International Conference on Historical Demography, dedicated to reassessing Malthus, demonstrated that “Malthus has little in common either with ‘neo-Malthusianism’ or with what is commonly called ‘Malthusianism’” (viii).

Kenneth Burke wrote that “neo-Malthusianism” refers to “not the proliferation of people to their physical limits, but the proliferations of habits to their physical limits,” and especially the habits of capitalism and technology. Burke asked, “How long, the admonitions of the neo-Malthusian principle admonish us to ask, can such a concept of ‘progress’ continue to engross mankind? Where do we reach the absolute breaking point, the degree of alienation beyond-which-not?” As such, an increase in corn production that seems to promise hunger relief can end up causing disaster owing to the over-application of pesticides and soil degradation caused by modern methods of monoculture: “By astute chemical transformations, corn can become the most paradoxical of things.” *Attitudes Toward History*, 298-300.

⁵² “The Malthusian League,” a British contraception advocacy group, operated in the late 19th and early 20th centuries.

⁵³ See, for instance, Dónal P. O’Mathúna’s “Human Dignity in the Nazi Era,” which traces a direct line of influence from Malthus to Darwin and Spencer, and on to Nazi medical ethics and practices.

⁵⁴ Quoted in Greene, *Malthusian Worlds*, 15. Ronald Greene went further to define rhetoric as a technology. He described how Malthusian rhetoric became a 20th century technology that seeks to control human procreation and potential overpopulation (15).

⁵⁵ Greene, *Malthusian Worlds*, 15.

⁵⁶ Malthus, first *Essay*, 68.

⁵⁷ Malthus, first *Essay*, 130.

⁵⁸ Bonar, *Malthus and His Work*, 85. Even his main argument became somewhat of an enigmatic puzzle, and Geoffrey M. Hodgson, in his biographical sketch of Malthus, called the simultaneous destructive and constructive “principle of population” that influenced Darwin’s development of evolutionary theory the “Malthusian paradox” (“Malthus,” 3). My use of the term “Malthusian Paradox” concurs that the “principle of population’s” emphasis on destruction and construction is key, but I differ by emphasizing that Malthus implicated technology as the lever that humanity depends upon to preserve itself when confronted by the unpredictable vagaries of nature. The result of construction or destruction rests on technology’s capacity to serve people. P. A. Jewell characterized the “principle of population” as the “Malthusian dilemma.” Jewell, “Species Diversity and Environmental Carrying Capacity,” 365. Malthus scholar Donald Winch called his population theory “a universal and perpetual dilemma” (*Malthus*, 1).

Other commentary on Malthus’s use of paradox and his paradoxical career includes John Stuart Mill who wrote of “the principle of population” that “Though the assertion may be looked upon as a paradox, it is historically true, that only from that time has the economical condition of the labouring classes been regarded by thoughtful men as susceptible of permanent improvement.” Quoted in Winch, *Malthus*, 6 and James, *Population Malthus*, 109. Bonar, also wrote that “Paradoxically, Malthus, who was all his life never more rabid in his politics than a mild Whig, became a hero of the Philosophical Radicals [such as Mill].” Bonar, Fay, and Keynes, “The Commemoration of Thomas Robert Malthus,” 62. Historian of political economy Samuel Hollander commented that Malthus “left himself wide open for misunderstanding because of his love of paradox, argument, and provocation, as well as a certain carelessness in the use of terms.” *The Economics of Thomas Robert Malthus*, 950. Economist, John M. Pullen wrote, “There was at least one aspect of Malthus’s thinking about which even his severest critics could not accuse him of being muddled. This was, paradoxically, his adoption and application of the doctrine of proportions itself – ‘paradoxically’ because it was his use of the doctrine of proportions which more than anything else gave rise to his reputation of muddle-headedness amongst those critics who did not realize or agree with the importance he attached to the doctrine.” Pullen, “Malthus on the Doctrine of Proportions and the Concept of the Optimum,” 430. In his critical biography, *Malthus*, Donald Winch called Malthus’s defense of Adam Smith’s position on “self-love” paradoxical because the attack brought Malthus close to agreeing with Godwin “in doubting whether economic growth was always advantageous to the mass of society” (32). Winch also wrote that understanding his population theory is fundamental for understanding the “peculiarities and paradoxes” that mark the differences between Malthus’s social scientific and moralist personae (35). Winch wrote, “Paradoxically...Malthus’s theological commitments provide him with a teleology of improvement that acts as the religious equivalent of the secular perfectibilism which his *Essay* set out to undermine” (35). Although he did not mention paradox, Malthus scholar W. Petersen noted that Malthus’s *Essay* has been misunderstood because “part of the difficulty lies in confusions and half-contradictions that Malthus introduced as he developed his ideas over a lifetime.” “Malthus and the Intellectuals,” 366. Jacques Dupâquier noted that William Petersen’s book *Malthus Reconsidered* was translated into French with an “apparently paradoxical title *Malthus, le Premier Antimalthusien*.” Thus, another way to characterize Malthus as paradoxical appears in this claim that Malthus was anti-Malthusian. See his “Preface” to *Malthus Past and Present*, viii.

⁵⁹ Malthus, first *Essay*, 71, paragraph arrangement altered.

⁶⁰ Ricardo, *Works and Correspondence*, vol. 8, 361.

⁶¹ Malthus, first *Essay*, 89-90; and Malthus, second *Essay*, 23.

⁶² Malthus, second *Essay*, 23. In the second *Essay*, Malthus excised two items, “vicious customs with respect to women” and “luxury,” from the first *Essay*’s much shorter list of positive checks. First *Essay*, 103.

⁶³ In *Autonomous Technology*, Langdon Winner wrote that the human drive to “master” nature involves “nothing less than the capacity of modern science to bring all of material reality under intellectual and practical command” (132).

⁶⁴ Quoted in James, *Population Malthus*, 125.

⁶⁵ Malthus, second *Essay*, 18.

⁶⁶ Malthus, second *Essay*, 257. In *A Summary View*, Malthus noted that the British population increased at a rate that would double the population in forty eight years (237). “[A]bout 6.5 million more people [was] being supported by the produce of British and Irish agriculture in 1801 than a century earlier” as the British population increased 70%

from 9.4 million to 15.9 million while “70-90 percent of the gain came in the second half of the period.” Chambers and Mingay, *Agricultural Revolution*, 3-4; and Landes, *The Unbound Prometheus*, 46. Landes attributed the capacity of Britain to absorb this “rapid growth of population” that included, between 1750 and 1830, both a doubling of population in rural counties in addition to increasing city and town populations, to the rapid rural population growth that led to urban emigration, emigration to English cities from Ireland and Scotland, and the mechanization of the textile industry (115-116). According to economic and social historian L. D. Schwarz, “London, which had begun the eighteenth century as the great devourer of lives from the country, a town that absorbed an inordinate part of the country’s natural population increase and proceeded to kill it, was by the mid-nineteenth century as healthy as the rest of the country and no longer a death trap.” *London in the Age of Industrialization*, 237.

⁶⁷ Malthus, second *Essay*, vol. 1, James ed., 229. More than 300,000 French soldiers died in the battle of 1812. Bell, *The First Total War*, 258.

⁶⁸ Malthus, second *Essay*, 34.

⁶⁹ Malthus, second *Essay*, 21.

⁷⁰ Malthus, second *Essay*, 204. Malthus made his agricultural skepticism clear throughout the *Essay*’s many additions. In the first *Essay*, Malthus dismissed the “Fallacy of the argument, which infers an unlimited progress from a partial improvement, the limit of which cannot be ascertained, illustrated in the breeding of animals, and the cultivation of plants.” Malthus, first *Essay*, 125. In *A Summary View of Population*, Malthus wrote that the power to produce greater quantities of food “is obviously limited by the scarcity of land – by the great natural barrenness of a very large part of the surface of the earth – and by the decreasing proportion of produce which must necessarily be obtained from the continual additions of capital applied to land already in cultivation” (225). He also repeated his pessimistic conception of agriculture, writing that the “actual increase” of crop yields “is extremely slow; and it is obvious, that...long before a final stop was put to all further progress, their actual rate of increase must of necessity be very greatly retarded, as it would be impossible for the most enlightened human efforts to make all the soil of the earth equal in fertility to the average quality of land now in use” (225).

⁷¹ Chambers and Mingay, *Agricultural Revolution*, 14, 35, 70, and 72; Ashton, *Industrial Revolution*, 27-28, 60, and 62; and Landes, *Unbound Prometheus*, 69-72 and 76. In describing the agricultural revolution, Chambers and Mingay echoed the technological idealism reminiscent of Godwin and Condorcet’s utopianism that saw permanent sustainability for an ever-increasing population with the agricultural innovations of the mid-19th century (14).

⁷² Malthus, second *Essay*, 244-245.

⁷³ Malthus, second *Essay*, 245.

⁷⁴ Cyphert, “Strategic Use of the Unsayable,” 90.

⁷⁵ Like many of Malthus’s claims about population, he was not the first to note the apparent geometrical and arithmetical increases of population and subsistence. Stangeland found the ratios in the “pre-Malthusian” work of Graunt, Petty, Saxe, Brückner, Mann, Suesmilch, Ortes, and unnamed others. *Pre-Malthusian Doctrines of Population*, 354. Furthermore, the ratios can be traced to one of Francis Bacon’s double arguments in *Advancement of Learning* that claimed “Custom goes in arithmetical, but Nature in geometrical progression” (294 [VI.iii]); In *Malthus and His Work*, Bonar also located Plato’s *Republic* (V.458) as a source of the ratios, a claim that I find tenuous at best (66). The ratios have remained popular proofs of the “principle of population.” In 1968, Paul Ehrlich used similar ratios in *The Population Bomb*. Ehrlich (17-18). Ehrlich concurred with Kenneth Smith that “In a book about population there is a temptation to stun the reader with an avalanche of statistics...no matter how you slice it, population is a numbers game” (17).

⁷⁶ Malthus, first *Essay*, 75.

⁷⁷ Malthus, first *Essay*, 75.

⁷⁸ Malthus, first *Essay*, 139.

⁷⁹ Malthus, first *Essay*, 139.

⁸⁰ For a sample of the controversy, see David Booth’s criticism of the ratios and Malthus’s removal of them from the last edition (1826) of the *Essay* in James, *Population Malthus*, 400-401; and Engels, “Outlines of a Critique of Political Economy,” 222. Engels proposed technology as a remedy for overpopulation upon criticizing Malthus’s ratios.

⁸¹ Marx, *Grundrisse*, 573-574 and 606. Historian David Hackett Fischer would label the ratios an example of the “fallacy of false extrapolation.” *Historians’ Fallacies*, 120.

⁸² Bonar, *Malthus and His Work*, 66; Hollander, *The Economics of Thomas Robert Malthus*, 21; and Flew’s “Introduction” to Malthus, first *Essay*, xi.

⁸³ Smith, *The Malthusian Controversy*, 210 and 234.

⁸⁴ Kant, *Critique of Judgment*, 106.

⁸⁵ Kant, *Critique of Judgment*, 128.

⁸⁶ Malthus, second *Essay*, 9-10. Edward Isaacson reprised this same claim in *The Malthusian Limit*, viii.

⁸⁷ Malthus, *Principles of Political Economy*, 314. Economist J. M. Pullen argued that such ambivalence should be understood in relation to Malthus's belief in the "doctrine of proportions," which held that economists should avoid polarized calculations. He wrote that, "In the literature on Malthus it is not uncommon to find statements accusing him of inconsistency and illogicity. The complexity of his system and his failure to produce a clear and simple solution to many of the problems he considered are given of evidence of his muddled thinking." "Malthus on the Doctrine of Proportions and the Concept of the Optimum," 419. Furthermore, "Searching for the best balance between opposing tendencies," as Pullen put it, well-described the entire purpose of the *Essay* – deciphering how best to manage the opposing tendencies of procreation and subsistence (432).

⁸⁸ Jacques Ellul later upheld the argument that technology proceeds in such a geometrical rate. In "The Technological Society," Ellul's second law of self-augmentation stated that "Technical progress tends to act, not according to an arithmetic, but according to a geometric principle." (89).

⁸⁹ Malthus, first *Essay*, 74.

⁹⁰ Malthus, first *Essay*, 74.

⁹¹ Malthus, first *Essay*, 74.

⁹² Malthus, first *Essay*, 138-139.

⁹³ Malthus, second *Essay*, 236-237. The second *Essay*'s feast metaphor became one of its most infamous passages. In full he wrote:

A man who is born into a world already possessed, if he cannot get subsistence from his parents on whom he has a just demand, and if the society do not want his labour, has no claim of *right* to the smallest portion of food, and, in fact, has no business to be where he is. At nature's mighty feast there is no vacant cover for him. She tells him to be gone, and will quickly execute her own orders, if he do not work upon the compassion of some of her guests. If these guests get up and make room for him, other intruders immediately appear demanding the same favour. The report of a provision for all that comes fills the hall with numerous claimants. The order and harmony of the feast is disturbed, the plenty that before reigned is changed into scarcity; and the happiness of the guests is destroyed by the spectacle of misery and dependence in every part of the hall, and by the clamorous importunity of those who are justly enraged at not finding the provision which they had been taught to expect. The guests learn too late their error, in counteracting those strict orders to all intruders, issued by the great mistress of the feast, who, wishing that all her guests should have plenty, and knowing that she could not provide for unlimited numbers, humanely refused to admit fresh comers when her table was already full."⁹³

This passage garnered so much harsh criticism that Malthus excised this passage from the 1806 and later editions of the *Essay*. Its excision did not prevent future calumination by rival political parties. For instance, the feast metaphor became a notorious proto-example of social Darwinism. In his critique of capitalism, anarchist political philosopher Rudolf Rocker wrote in *Nationalism and Culture*, that "Hobbes' 'war of all against all' became once more the unalterable course of nature, which could be changed by no ethical considerations, and the advocates of 'social Darwinism' never tired of mouthing the gloomy declaration of Malthus that the table of life is not spread for everyone" (470). Also, the socialist Pierre-Joseph Proudhon used this passage as the basis for his critique of French capitalism, *The Malthusians*, in which he stated that "The theory of Malthus is the theory of political murder," and economists "cannot conceive how, without some sort of an organization of homicide, a balance between population and production can exist" (6-7).

⁹⁴ Hobbes, *Leviathan*, 70.

⁹⁵ Yet again, Malthus did not originate this link. It is ancient, a manifestation of the biblical apocalypse. One of Malthus's intellectual predecessors for instance, William Petty wrote in 1682 that once there is "one Head for every Two Acres of Land in the *Habitable* part of the earth," then "according to the *Prediction* of the *Scriptures*, there must be *Wars* and great *Slaughter &c.*" "Another Essay in Political Arithmetick," 464. Also see Petersen, *Malthus*, 173.

⁹⁶ In the words of Ron Greene's *Malthusian Worlds*, "the principle of population serves to divide the national body into competing social bodies requiring the extermination of biologically dangerous bodies in order to protect and promote the life of the national body" (12). Claude Lévi-Strauss formulated a similar scenario: "Once men begin to feel cramped in their geographical, social and mental habitat, they are in danger of being tempted by the simple solution of denying one section of the species the right to be considered human." *Tristes Tropiques*, 149.

⁹⁷ See for instance his chapter entitled "Of the Necessity of General Principles on this Subject" in the second *Essay*.

⁹⁸ Malthus, *Principles of Political Economy*, 5-6.

⁹⁹ Malthus, first *Essay*, 123 and 131. See Condorcet, *Outlines*, 343-344; and Godwin, *Enquiry Concerning Political Justice*, 77-78.

¹⁰⁰ Malthus, second *Essay*, 9.

¹⁰¹ Bonar, *Malthus and His Work*, 266. For an account of Malthus's recalcitrance toward pure induction and mathematical analysis of political economy, see N. B. de Marchi's and R. P. Sturges's "Malthus and Ricardo's Inductivist Critics: Four Letters to William Whewell."

¹⁰² Malthus, first *Essay*, 75.

¹⁰³ Young, "Malthus on Man," 73.

¹⁰⁴ Malthus, first *Essay*, 80.

¹⁰⁵ Regarding Malthus's rhetorical accomplishments, Walzer wrote: "Malthus discovered the importance ("weight") of an idea (the principle of population) whose significance ("force") to a philosophical and political question important to his contemporaries had not been elucidated. By claiming that the principle was a universal, eternal law . . . he gave to it new meaning as a centripetal law of history. This seems to me a just statement of Malthus's achievement, and it is a distinctively rhetorical one." "Logic and Rhetoric," 15.

¹⁰⁶ Malthus, first *Essay*, 83.

¹⁰⁷ Malthus, first *Essay*, 84.

¹⁰⁸ Malthus, second *Essay*, 18.

¹⁰⁹ Malthus, second *Essay*, 18.

¹¹⁰ Malthus, first *Essay*, 118-119.

¹¹¹ Malthus, first *Essay*, 138-139.

¹¹² Malthus, second *Essay*, 316-317.

¹¹³ In the same letter, Ricardo further described Malthus's problematic terminology: "the error, [in Malthus's refutations of J. D. Say and Ricardo] is in his language, he appears to me not to be aware of the import of his words which he uses – they convey a totally different meaning to his mind, and to mine!" Ricardo, *Works and Correspondence*, vol. 8, 331. Ironically, Hollander wrote that, "Precisely what Ricardo intended [in this same passage] is unclear." *The Economics of Thomas Robert Malthus*, 986. Furthermore, Bonar suggested in *Malthus and His Work* that the most problematic of Malthus's imprecise use of terms derived from his metaphors, asserting that "The abundant metaphors of the first Essay had led to many misunderstandings" (418).

¹¹⁴ Ricardo wrote to Malthus that, "With respect to the world value you have defined it one way, I another. We do not appear to mean the same thing and we should first agree what a standard ought to be, and then examine which approaches nearest to an invariable standard the one you propose, or that which I propose." *Works and Correspondence*, vol. 8, 229. In the preface to *Definitions in Political Economy*, Malthus noted that, "The differences of opinion among political economists have of late been a frequent subject of complaint; and it must be allowed, that one of the principal causes of them may be traced to the different meanings in which the same terms have been used by different writers" (vii). Yet, Malthus conceded that his definitions were neither complete nor infallible, and he even questioned the entire plausibility of his undertaking. "I am strongly, indeed, disposed to believe, that in the sciences of morals, politics, and political economy, which will not admit of a change in the principal terms already in use, the full attainment of this object is impossible; yet a nearer approach to it is always something gained," he wrote (260).

¹¹⁵ Lanham, *A Handlist of Rhetorical Terms*, 16, emphasis mine.

¹¹⁶ Hobbes, *Leviathan*, 5.

¹¹⁷ Richards, *The Philosophy of Rhetoric*, 97.

¹¹⁸ Godwin, *Enquiry Concerning Political Justice*, 576.

¹¹⁹ Godwin, *Enquiry Concerning Political Justice*, 576.

¹²⁰ Malthus, first *Essay*, 144; and second *Essay*, 66-67.

¹²¹ As if in corroboration of the confusion caused by Malthus's terminology in general and the machine metaphor, commentators have ascribed other "main springs" to Malthus's conception of government. An anonymous critic dubbed the entire "principle of population" as the "master-spring in this social and political machine." Quoted in James, *Population Malthus*, 111. Jacques Dupâquier contradicted this passage in Malthus to single out marriage as the "main spring" of the "machine," not "self-love." He wrote that Malthus, "Nearly two centuries ahead of his time he was able to show that in Europe the institution of marriage furnished the central pivot of the regulating mechanism." See his "Preface" to *Malthus Past and Present*, xii.

¹²² Malthus, second *Essay*, 331. Also see Malthus, first *Essay*, 144.

¹²³ Malthus, first *Essay*, 179.

¹²⁴ Malthus, *Principles of Political Economy*, 360. Malthus defended his ambivalence, noting that the “evils” of machinery affected classes differently. He wrote, “it appears to me not a little extraordinary that I should sometimes have been classed with Mr. [Simonde de] Sismondi as an enemy to machinery” (352).

¹²⁵ Malthus, first *Essay*, 155.

¹²⁶ Malthus, first *Essay*, 103, and Malthus, *A Summary View*, in Malthus, first *Essay*, 250.

¹²⁷ Malthus, second *Essay*, 186. Numerous condemnations of factory working conditions, workers’ living conditions, and industrialists’ exploitation of children appeared, to depict the roots of Britain’s expanding wealth, economy, and upper classes. Friedrich Engels’s *The Condition of the Working Class in England* (1845) is perhaps the most famous. In John Fielden’s *The Curse of the Factory System* (1834), he wrote of child labor that: “in many of the manufacturing districts, the most heart-rending cruelties were practiced on the unoffending friendless creatures...they were flogged, gettered and tortured in the most exquisite refinement of cruelty, that they were, in many cases, starved to the bone while flogged to their work, and that even in some instances they were driven to commit suicide.” Quoted in Avery, *Progress, Poverty and Population*, 86.

¹²⁸ Malthus, second *Essay*, 134; and Malthus, *Principles of Political Economy*, 352.

¹²⁹ His hope in industrialization grew in each edition of the *Essay*, as documented by G. Gilbert, “Economic Growth and the Poor in Malthus’ *Essay on Population*.” Gilbert argued, “Over a twenty-three year period of the simple analysis of a special type of growth inimical to the welfare of the poor is gradually qualified and at the same time purged of its anti-manufacturing overtones. Indeed by the fifth edition (1817), Malthus can marshal both fact and theory behind a relatively *hopeful* view of the benefits the working poor might derive from a growing national output” (191, emphasis his).

¹³⁰ In *The Philosophy of Rhetoric* Richards noted that “mechanical analogies” can cause misunderstanding by oversimplifying the psychological processes of understanding language that they are supposed to illuminate. (13). In his Foucault-ian critique more specific to Malthus’s metaphor, Ron Greene noted in *Malthusian Worlds* that calling a “governing apparatus,” a machine can also lead to misunderstanding. He wrote, “It is important not to reduce the idea of a governing technology to a machine, although machines might function as technologies that make a particular type of work possible or more efficient. A governing technology is both more and less than a machine” (8).

¹³¹ Malthus, second *Essay*, 222. The term “redundant population” was not idiosyncratic to Malthus, but a common term used by contemporaneous political economists to describe people who served no function for capitalism or worked at its extreme periphery. “Redundancy” also applied to other realms of the economy, such as currency, about which David Ricardo and Malthus long argued. Regarding redundant populations, though, the two authors agreed. Ricardo wrote in his treatise *The Principles of Political Economy and Taxation* (1817) that, “the substitution of machinery for human labor” is “the same cause which may increase the net revenue of the country may at the same time render the population redundant, and deteriorate the condition of the laborer,” such that “the situation of the laboring classes will be that of distress and poverty” (251 and 253). Although historians of political economy have enumerated the many theoretical differences between Ricardo and Malthus, both noted the contradictory tendencies of machinery to create and destroy people by providing employment, thereby a stimulus to procreate, and by taking away employment, thereby afflicting the unemployed. Ricardo’s treatment of the redundancy of people thus echoed Malthus. Hollander reviewed this debate in *The Economics of Thomas Robert Malthus*, 692-701.

¹³² Cunningham and Grell, *Four Horsemen*, 98.

¹³³ Aberth, *From the Brink*, 63. Also, McNeill called population growth the “fundamental disturber” of French society that spurred the French Revolution, and the impetus of the industrial revolution. *The Pursuit of Power*, 185.

¹³⁴ Malthus, second *Essay*, 338.

¹³⁵ Malthus, second *Essay*, 43; and Malthus, *A Summary View*, reprinted in Malthus, first *Essay*, 254.

¹³⁶ Malthus, second *Essay*, vol. 1, James ed., 37.

¹³⁷ McNeill, *The Pursuit of Power*, 141.

¹³⁸ Adam Smith, Malthus’s intellectual predecessor, noted in *Wealth of Nations* that “in a country of which a great part of the inhabitants are artificers and manufacturers, a great part of the people who go to war must be drawn from those classes, and must therefore be maintained by the publick as long as they are employed in its service,” and they must be maintained by the public because of “the progress of manufactures, and the improvement in the art of war” (397).

¹³⁹ McNeill, *The Pursuit of Power*, 207-208.

¹⁴⁰ Ricardo, *The Principles of Political Economy and Taxation*, 255-256.

¹⁴¹ Bonar wrote that, “Switzerland had exemplified the fact that Emigration does not permanently check population, but, on the whole, encourages it. France, at the time chosen [the Revolution], exemplified the fact that even the most

destructive wars have a similar effect on the growth of numbers.” France’s population increased from 26 million to 28 million during the Revolutionary period. To explain this increase Bonar pointed toward the industrialization of France which, like in England, led to more births than could be offset by war fatalities. He noted that “for war purposes...every new annual surplus of 80,000 youths above eighteen might be taken for military service without any diminution in the number of marriages.” *Malthus and His Work*, 155, 157, and 161. Regarding concomitant wars, industrial expansion, wealth production, and improved agriculture from 1793 to 1810, Ricardo wrote “There has been an increased rate of profits, but it has been accompanied with such decided improvements of agriculture both here and abroad, for the French Revolution was exceedingly favourable to the increased production of food, that it is perfectly reconcilable to my theory [that the creation of profits attends the creation of wealth during wars].” *Letters of David Ricardo to Thomas Robert Malthus*, 8.

¹⁴² *A Summary View*, In Malthus, first *Essay*, 231. Malthus also intimated the violent context of his *Essay* in the preface to the fifth edition (1817) by situating the original 1798 edition in a period of violence: “This essay was first published at a period of extensive warfare, combined, from peculiar circumstances, with a most prosperous foreign commerce” (Malthus, second *Essay*, 11).

¹⁴³ Brodie and Brodie, *From Crossbow to H-Bomb*, 30.

¹⁴⁴ Quoted in McNeill, *The Pursuit of Power*, 192

¹⁴⁵ Brodie and Brodie, *From Crossbow to H-Bomb*, 107. “The French Revolution saw the first real attempt to mobilize the scientific talent of a nation.” Brodie and Brodie, *From Crossbow to H-Bomb*, 106.

¹⁴⁶ Bell, *The First Total War*, 149; and Brodie and Brodie, *From Crossbow to H-Bomb*, 106-107. Napoleon disparaged rifles in comparison to muskets for their lengthy loading time, calling them “the worst weapon” and banning them in 1805. Headrick, *The Tools of Empire*, 87-88.

¹⁴⁷ Bell, *The First Total War*, 124 and 174.

¹⁴⁸ Bell, *The First Total War*, 252-253 and 296-297.

¹⁴⁹ Quoted in Bell, *The First Total War*, 115.

¹⁵⁰ Bell noted that, “during the Terror of 1793-1794...the idea of a total, physical extermination of France’s enemies did not remain comfortably theoretical...the torch of total war was first applied to a region of France itself: the Vendée.” *The First Total War*, 153.

¹⁵¹ Quoted in Bell, *The First Total War*, 117; Bell, *The First Total War*, 161.

¹⁵² Quoted in Bell, *The First Total War*, 116.

¹⁵³ Quoted in Bell, *The First Total War*, 116.

¹⁵⁴ Bell, *The First Total War*, 116.

¹⁵⁵ Bell, *The First Total War*, 146.

¹⁵⁶ Bell, *The First Total War*, 160-161.

¹⁵⁷ Bell, *The First Total War*, 212-217.

¹⁵⁸ According to Bell, “The rhetoric does matter...for it shows just how completely the French state had...rejected the older regime of limited war” (*The First Total War*, 143).

¹⁵⁹ Brundage, *The English Poor Laws*, 25-26.

¹⁶⁰ Ricardo, *Works and Correspondence*, vol. 8, 107-108.

¹⁶¹ In an anonymous threat to the British government, received by Home Office Secretary Richard Ryder, the “Luddites” wrote: “Every frame Breaking act you Make an amendment...only shortens your Days...there are fire Ships Making to saile by land as well as by Warter that will not faile to Destroy all the Obnoxious in...both Houses as you have been at a great Deal of pains to Destroy Chiefe part of the Country...The Remedy for you is Shor Destruction Without Detection - - prepare for thy Departure and Recomend the same to thy friends.” Quoted in Binfield, *Writings of the Luddites*, 1.

¹⁶² Quoted in Huzel, *The Popularization of Malthus*, 197. Other Pauper Press editors and writers, such as *The Black Dwarf*’s Thomas Wooler, *The Gauntlet* and *The Cosmopolite*’s Richard Carlile, and *The Radical*’s James Lorymer, held similar violent revolutionary convictions, as did the popular and well-published anti-Malthusian William Cobbett (214 and 236).

¹⁶³ Quoted in Huzel, *The Popularization of Malthus*, 197.

¹⁶⁴ For an etymology of “total war,” see Bell, *The First Total War*, 9).

¹⁶⁵ Clausewitz, *On War*, 254, 706, 732, and 736.

¹⁶⁶ Clausewitz, *On War*, 717.

¹⁶⁷ Bonaparte supposedly said this in 1813 to Austrian statesperson Clemens Lothar Wengel von Metternich. Quoted in Bell, *The First Total War*, 206 and 251.

¹⁶⁸ The most destructive warfare possible did not exterminate any nation, far from it. Later “total wars” did not live up to the ideal either. Roger Chickering, a historian of total war theory, argued in “Total War” that the term gets used so often, that its usages tend to stray from the strict concept to signify almost any conflict that gets described with hyperbole “in terms so extravagant that no war yet has fulfilled them,” or the term still gets used, but it gets qualified to fit less-than-total wars (18). Of the hyperbolic usage of “total war,” he further wrote: “‘Total’ is a powerful word. Its connotations are foreign to compromise, qualification, or nuance. When soldiers, politicians, and bureaucrats invoked the idea of total war for partisan purposes in times of duress, they indulged the rhetorical excess that was inherent in the concept from the beginning” (17). Furthermore, replacement adjectives for “total” get substituted, including absolute, hyperbolic, general, hegemonic, and systemic, while “The rhetorical disarray reflects a grave flaw in a narrative organized around the concept of total war. The narrative repeatedly misrepresents the history of warfare during the past two centuries, for its heuristic constraints elide varieties of military experience that violate the developmental patterns it prescribes” (18-19).

¹⁶⁹ Many Malthus scholars have written overviews of Malthus’s influence on Darwin and Wallace, among them Petersen, *Malthus*, 218-230; Young, “Malthus on Man”; and Keynes, “Malthus and Biological Equilibria.”

¹⁷⁰ Malthus, first *Essay*, 114. Also compare Malthus, first *Essay*, 268. Darwin quoted in Young, “Malthus on Man,” 82.

¹⁷¹ According to economic historian Robert Young’s “Malthus on Man,” Darwin considered “his theory as a generalization of Malthusianism” (82). Marx somewhat concurred that Malthus’s importance derives, in part, from his generalization of ‘brutality’ to “all forms of society” despite Malthus’s lack of solid proof. *Grundrisse*, 605.

¹⁷² Meek, *Marx and Engels on the Population Bomb*, 48-49.

¹⁷³ Malthus, first *Essay*, 210.

¹⁷⁴ Malthus, second *Essay*, 9.

¹⁷⁵ Napoleon was, according to military historian Liddell Hart, “curiously indifferent to the opportunity of introducing new weapons, and his era of warfare was notably unproductive, though it coincided with the spring tide of Industrial Revolution.” Quoted in Brodie and Brodie, *From Crossbow to H-Bomb*, 108-109.

¹⁷⁶ According to military historians Brodie and Brodie, “The American Civil War was a colossal proving ground for improved weapons of all kinds. For the first time the achievements of the industrial and scientific revolution were used on a large scale in war.” *From Crossbow to H-Bomb*, 133-134.

¹⁷⁷ The Brodies wrote of 19th century weapons that “There was abundant opportunity for experimentation with and testing of new weapons, and for a realization of the dizzying impact of science and the industrial revolution upon tactics and strategy. Communications were completely transformed by the steamship, the railroad and the telegraph. Armies were much bigger than before and more mobile; firepower was vastly more effective, thanks to the adoption of rifles and breechloading weapons of all kinds; and war became more destructive than ever in the past. The American Civil War cost 600,000 dead out of a population of 31,000,000 and the Franco-Prussian War was equally deadly while it lasted.” *From Crossbow to H-Bomb*, 124-125.

Chapter 3

Bomb Talking: August Spies and Dynamite at the Haymarket Trial

“We have preached dynamite!”¹⁷⁸ —August Spies

“REVENGE! Workingmen, to Arms!” read August Spies’s infamous circular of May 3, 1886.¹⁷⁹ Spies drafted, printed, and circulated the document in Chicago on a day of widespread strikes and a clash at the McCormick Reaper Works where strikers had attacked their replacement “scab” workers with sticks, stones, and bricks. The commotion at McCormick’s interrupted Spies’s own nearby speech to the Lumber Shovers’ Union. When he arrived at the factory, he saw strike-breaking police, led by notorious Captain John Bonfield, clubbing people and shooting at random into a large crowd of workers. Two strikers died. Cyrus H. McCormick, Jr. and the *Chicago Tribune* blamed Spies and his “incendiary” language for the riot.¹⁸⁰

This May, 1886 installment of the then 19-year-old violent labor conflict at McCormick’s, a farm machinery factory, was precipitated by another strike the previous year that had forced McCormick to reinstate the wages he had previously cut. But in response to the workers’ temerity in that strike, McCormick installed pneumatic iron-molding machinery to replace those most responsible for organizing the strike.¹⁸¹ Later he replaced all union workers with scabs. These union workers and other unemployed Chicagoans did not remain idle as new machinery rendered jobs obsolete, and as replacement workers arrived from around the world to compete for remaining jobs. They took to the streets.

The clash at McCormick’s occurred on the third day of a national strike for the eight-hour workday. On May 1, 40,000 Chicagoans and 350,000 laborers nationwide had walked out. In the

years leading up to the eight-hour strike, the number of such labor protests had increased, as had the levels of violence and bloodshed used to suppress them. Much like Malthus's London, the City of Chicago was experiencing an industrial population explosion that exacerbated the miserable poverty in which a large portion of the city's population lived. In 1867, the state of Illinois legislated an eight hour workday to help alleviate labor problems, but employers refused to abide by the law. According to Spies, the implementation of "labor-saving machinery" was the "principle reason" workers demanded a reduction in working hours. Workers thought shorter workdays would prevent even greater unemployment.¹⁸² Chicago anarchists, of whom Spies was a principal agitator, viewed the eight hour issue as moot, since it would in no way alleviate the system of "wage slavery." Still, in May 1886, they sided with the eight-hour movement in order to maintain and boost anarchist support among workers.¹⁸³

May 1st and 2nd passed with little aggression, but residents of Chicago were tense when Spies's May 3rd "revenge circular" called for workers to unite in resistance to the police violence at McCormick's.¹⁸⁴ In what had become a commonplace response to state interventions into workers' affairs, Spies's "revenge" circular concluded: "If you are men, if you are the sons of your grand sires, who have shed their blood to free you, then you will rise in your might, Hercules, and destroy the hideous monster that seeks to destroy you. To arms we call you, to arms!"¹⁸⁵ Although the message was ambiguous, at Haymarket, someone threw a bomb. The dynamite rhetoric of the anarchists materialized, as much to their surprise as anyone else's.

When Spies arrived at the May 4th Haymarket rally, he found a restless crowd and no organizers. After rounding up some speakers, Spies began the evening's events by giving a rather tame twenty-minute speech. Albert Parsons, Spies's friend and colleague, followed, echoing the familiar call to arms. "Americans, as you love liberty and independence, arm, arm

yourselves!”¹⁸⁶ A few minutes later he demurred, “I am not here for the purpose of inciting anybody.”¹⁸⁷ Samuel Fielden spoke last, and uttered the words that Bonfield used to justify the police raid, and for which he would have to defend himself in court: “Keep your eye on the law. Throttle it. Kill it. Stop it. Do everything you can to wound it—to impede its progress.”¹⁸⁸ Fielden did not speak long. With a storm blowing in, the crowd of about 3,000 dwindled to about 500. Despite the peacefulness of the meeting, to which even attendee Chicago Mayor Carter H. Harrison attested, a force of 176 police officers under the direction of Captains Bonfield and William Ward closed in on the speakers’ wagon in double time from their nearby station. Ward ordered Fielden and the audience to disperse. At that moment a bomb sailed into the police ranks and exploded, killing at least one policeman.¹⁸⁹ The police began firing their revolvers into the crowd “in wild confusion,” and they clubbed audience members without mercy and without discrimination as people fled the scene.¹⁹⁰ According to some reports, Lieutenant James Bowler yelled “Fire and kill all you can!” and Bonfield prized a gun from the hand of a dead officer and shot with two weapons.¹⁹¹ Seven policemen died, most from friendly fire, and 60 were injured. An unknown number of civilians died and were injured. An apparent assassin planted in the crowd attempted to shoot Spies in the back during the chaos. Spies’s brother, Henry, intervened to save Spies and got shot in the groin. In Haymarket’s aftermath, Spies would be tried as a bomb conspirator—for “preaching dynamite”—convicted, and executed.

But not before giving his most famous speech. Upon his death sentence he addressed Judge Joseph E. Gary’s court. In it “dynamite” factored not as mere metaphor, but as the central trope through which Spies worked through the reverberations of the Malthusian Paradox in 19th century middle-America. In order to argue for the plausibility of anarchist social revolution he had to imbue “dynamite” with the powers to wreak massive destruction on industrial capitalism

and to preserve workers at the same time. In one sense, Spies's calls to explode capitalists and capitalist property with dynamite were then a commonplace of the anarchist movement, and the act of dynamiting perhaps best exemplified acts of revolutionary violence, or "propaganda by the deed."¹⁹² But in another sense, anarchists like Spies touted a *weapon*, the technological means and manifestation of violence, as the world-historical agent of revolutionary change. Spies's talk of dynamite was therefore a paradoxical rhetoric of technology much like Malthus's, summoning technology in order to combat a world more and more beholden to it. But Spies was not a would-be social engineer who sought to maintain an aging republican society amidst the industrial revolution. He was an activist, seeking to deploy "revolutionary" technologies to overthrow capitalism. Spies and his co-anarchists thus used a technological rhetoric of terrorism to advocate a classless technological utopia.

As a nascent rhetoric of terrorism, the way that Spies spoke and wrote of dynamite would later echo in the ways that people framed fertilizer truck bombs in Oklahoma and improvised explosive devices in Iraq. "Infernal machines," as dynamite bombs had come to be known, were assembled by revolutionaries at home with mass-produced materials, and promised immense political power for their small-time manufacturers.¹⁹³ Dynamite bombs, however, never quite fulfilled this promise. As states and populations prepared for the "Great War," a war of capitalist expansion facilitated by industrial technology, the Haymarket bombing provided a glimpse at the seeming futility of resisting military expansion with weapons rhetoric.

To explore "dynamite's" role in the longitudinal history of paradoxical weapons rhetoric, I divide this chapter into four sections. In the first section, I explore bomb talking in anarchist political discourse. Then I examine Spies's "Address to the Court," arguing that Spies used the instability of bomb talking to destabilize American politics. This instability of language is

observable in three of Spies's crucial rhetorical tactics. First, he made elaborate turnaround arguments about the concepts of destruction and preservation that depicted destroying capitalism as worker preservation and destroying workers as capitalist preservation. Like Malthus's generalizations about global warfare, Spies's turnaround arguments amplified the political function of dynamite. Unlike Malthus's anti-Revolutionary position, Spies used amplification to demonstrate that bomb throwing was a viable corrective to political and industrial violence. Second, similar to the way Malthus reified the "machine" metaphor with antistasis, Spies's ironic "dynamite" metaphor reified his figural, more impractical exhortation to destroy the government as the literal, pragmatic, and immediate need for workers to prepare for self-defense. Third, Spies cultivated an image of himself as a martyr, and thereby he made a synecdochic generalization about his violent demise and the eventual demise of capitalism. I then examine how Haymarket-era bomb talking proved self-defeating for the anarchist movement. I conclude by indicating the rhetorical legacy of anarchist bomb talking.

Bomb Talking

Haymarket was the first terrorist dynamite bombing in the United States that gained widespread publicity, and it thereby gave presence to the rhetorical threat of random bombings.¹⁹⁴ Before this clarifying event, talk of bombs had infused the public discourse of 19th century class conflicts, and especially that of Haymarket's primary participants. At the Haymarket trial, Spies and his co-defendants spoke of dynamite. A lot. Their many appeals to destroy capitalism, its edifices, and its advocates with dynamite, and their high praise of dynamite constituted what Floyd Dell, a Chicago literary critic, poet, and radical journalist, called "bomb-talking."¹⁹⁵ But these threats of destruction and encomiums to dynamite were not

particular to Spies's rhetoric, or to the rhetoric of other likeminded political agitators, but extended to the rhetoric of journalists and political authorities, both in the U.S. and abroad. To settle labor disputes, every party seemed delirious to blow up their adversaries. Spies thus participated in a common international discourse that upheld dynamite as *the* singular technology that would somehow sweep capitalists from power and destroy governments, or at least could symbolize as much. When Spies preached dynamite, he operated within a militant discourse underpinned by anarchist political theory and the possession of dynamite bombs by revolutionary-minded workers. Dynamite not only infused Chicago's political discourse circa 1886, but it pervaded the Haymarket trial, both in language and in material presence.

Alfred Nobel invented and patented dynamite after a sustained effort to produce an explosive that would ensure his family's financial success.¹⁹⁶ Nobel's father, Immanuel, ran a large weapons business in Russia, manufacturing rifles, mines, cannonballs, mortars, and other machine components that supplied Russian munitions during the Crimean War. Explosives became the fulltime occupation of Alfred, and he began manufacturing nitroglycerine for commercial use in 1862.¹⁹⁷ He developed Nobel's Blasting Oil, a powerful, volatile explosive, but liquid nitroglycerine proved too prone to accidental explosions to remain a marketable product. Nobel's subsequent invention of dynamite in 1867 made nitroglycerine "safe" to handle by using an absorbent material, kieselguhr, to soak up the liquid, which formed a putty. A cardboard wrapper prevented leakage, and a mercury fulminating (blasting) cap completed the packaged explosive. The same year, Nobel began manufacturing dynamite in twelve countries, creating an expansive international dynamite empire. By the early 1880s Nobel operated 93 factories worldwide, and by the late 1880s he had patented Nobel's Blasting Powder, or ballistite, a military-grade dynamite.¹⁹⁸ In this period, "dynamite" became a generic term for

Nobel's mixture, a mixture that people could imitate with ease by substituting other absorbent materials (most often sawdust) for kieselguhr.¹⁹⁹ The global distribution of Nobel's dynamite and the knowledge of its basic design made bombs easy to procure or make for anyone who wanted to throw them, whether state-sponsored soldier or revolutionary.

For anarchists worldwide, dynamite became a means to use an industrial technology to destroy the system of industrial technology. Revolution thus required both a rejection of and an embrace of technology. In *God and the State* and *Statism and Anarchy*, Russian anarchist Michael Bakunin revised the concept of "science" to undermine "the triumph of a brutal materialism" that resulted from the deification of science and technology.²⁰⁰ Bakunin's humanized conception of artifice rejected the unthinking worship of technology, even as it welcomed any technology that would benefit workers.²⁰¹ "Science" therefore stood between the workers' quest to end the "perpetual and bloody immolation of millions of poor human beings in honor of some pitiless abstraction" and the bloody immolation of workers.²⁰² Bakunin's humanization of science resembled what has become known as the "democratization of technology," or the political empowerment of all citizens with scientific and technological knowledge. For Bakunin, science "must spread among the masses. Science, being called upon to henceforth represent society's collective conscious, must really become the property of everyone."²⁰³

But such democratization had curious implications. Well-disseminated chemical knowledge of dynamite production in the hands of everyone, for instance, would facilitate liberation. This science in the hands of a few technocrats would facilitate enslavement. Bakunin did not propose any specific changes to technology; rather he proposed a change in the relationship of everyone to technology such that the masses would control it rather than the few.

Bakunin did not describe how transferring ownership would solve the problems of dangerous factory conditions, the production of dangerous products, and the despoiling of the environment. Yet, destroying the state with explosive science in a revolution that “spares nothing and stops at nothing” provided a more immediate, concrete solution for technological oppression.²⁰⁴ In the hands of all workers, dynamite could even the imbalance of weaponry with the state.

Another Russian anarchist political philosopher, Peter A. Kropotkin, shared Bakunin’s vexed approach toward technology. In “Modern Science and Anarchism,” Kropotkin defined anarchism in technological terms, describing it as a “world-concept based upon a mechanical explanation of all phenomena, embracing the whole of nature” as well as embracing scientific method.²⁰⁵ He saw “perfection” in turn of the century industrial and agricultural techniques, claiming that with these techniques “a very high degree of well-being can easily be obtained in a few years by communist work.”²⁰⁶ Kropotkin further called for a fluid method of calibrating society, an anarchism powered by industry and machines.²⁰⁷ But Kropotkin dissociated “modern science” from the other industrial powers – states, religions, laws, militaries, and landlords. Anarchists must not destroy industrial technology as they would these other modes of power. Technology formed both a primary root of the problem and a primary root of the solution.

Most of the Haymarket defendants echoed these ambivalent sentiments toward technology.²⁰⁸ And despite their vehement political disagreements, anarchists and capitalists agreed that they could use the same tools, machines, and dynamite to achieve their goals. Dynamite in particular provided anarchist political theory with the apparent technological means to destroy the governmental machine. The dynamite assassination of Russia’s Czar Alexander II in 1881 showed that the “science” of modern explosives could work on a much larger scale if studying, making, distributing, and using dynamite became a point of emphasis for anarchists.²⁰⁹

Other weapons introduced during the American Civil War, such as rifled and breech-loaded artillery, repeating breech-loaded rifles, land and marine mines, armored trains, flame throwers, submarines, torpedoes, and steam-powered ironclads did not suit anarchist goals in the same way. They were too difficult or expensive for non-governmental entities like impoverished factory workers to appropriate, manufacture, and deploy. Other weapons also gained infamy in both revolutionary and mainstream presses during this period, such as the Gatling gun, the Winchester rifle, and the Colt revolver, yet these weapons cost more, and individuals could not reproduce them at home. Not so with dynamite. Dynamite's design offered common availability, cheapness, and an easy way to make bombs.²¹⁰ With dynamite costing about 40 cents per pound and individual bombs costing between six and fifteen cents, almost any daring individual could make them.²¹¹ For all these reasons German militant anarchist Johann Most recommended using dynamite bombs to carry out "propaganda by the deed" in *Revolutionäre Kriegswissenschaft* [Revolutionary War Science].²¹² And for these reasons, the Congress of Socialists of the United States, in part organized by Spies, called for revolutionary violence with such "scientific" methods.²¹³

In fact, much of Spies's career prior to Haymarket involved his prolific participation in this common international dynamite discourse. Spies's May 3rd editorial on the eight-hour strike, which he published in his newspaper, *Die Chicagoer Arbeiter-Zeitung*, his May 3rd speech to the Lumber Shovers' Union, and his revenge circular of May 3rd were workaday affairs, little different from his full-time agitation for workers' rights. As such, Spies's call for armed retribution differed little from his typical bomb talking as well as it differed little from other anarchist discourse. Spies's revenge circular, for instance, echoed Most's *Revolutionäre*

Kriegswissenschaft, which demanded “Proletarians of all countries, arm yourselves! Arm yourselves by whatever means you can. The hour of battle is near.”²¹⁴

Spies made such rhetoric a driving force in Chicago labor politics. By the general strike of May 1st he was one of the foremost labor leaders not only in Chicago but in the United States. A German immigrant who arrived in New York City in 1872, Spies opened an upholstery shop in Chicago in 1876 as a twenty-year-old. The national Railroad strike of 1877 drew his attention to the plight of workers and the brutality of their suppression. The same year, Spies joined the Socialistic Labor Party [SLP] and its armed educational defense group, the *Lehr-und-Wehr Verein*.²¹⁵ Along with many other disgruntled party members he dropped out of the SLP in 1880 after the SLP ordered its groups to cut ties with the *Lehr-und-Wehr Verein*.²¹⁶ Spies believed that the SLP’s democratic political engagement was an ineffective means to enact inadequate reforms in a corrupt system. In 1880 as well Spies became the manager of the *Arbeiter-Zeitung*, which became the most-distributed German-language paper in Chicago. He took over its editorship in 1884.²¹⁷ Among the multitude of socialist and anarchist newspapers in Chicago, the *Arbeiter-Zeitung* played a key role in urging workers to action. Imprisoned after Haymarket, Spies continued contributing material to the paper by smuggling it out with friends and family.²¹⁸ He also published in English in *The Alarm*, edited by Parsons. As a well-reputed and skilled orator, he advocated anarchism on lecture tours of the east coast and Midwest, from New York to Omaha. Spies’s integration into Chicago’s German working class culture also included membership in the Aurora Turnverein, a politically infused gymnastics club, and appearing in a labor-movement play, Wilhelm Rosenberg’s *Die Nihilisten*, which Spies co-wrote, in 1882.²¹⁹

Through this prolific agitation, Spies garnered widespread international recognition.²²⁰ In 1883 he became the secretary for the International Working People’s Association’s [IWPA]

Information Bureau and a member of its General Committee. The IWPA was the nascent anarchist revolutionary party that coalesced around two events – the refusal of a faction of the SLP to form a coalition with the Greenback Party, and Johann Most’s speaking tour of the U.S. Owing to Most’s influence, arming workers became a primary purpose of the IWPA. Spies helped to draft the IWPA’s 1883 “Pittsburgh Manifesto,” which called for the destruction of class-based society in its first resolution. It sold 200,000 copies in four languages.²²¹ In contrast to Most’s sole focus on force and violence to achieve revolution, under Spies’s and Parsons’s organization the Chicago IWPA teamed with unions and labor groups to promote workers’ rights. One of many splintered forms of anarchist thought, Spies’s and Parsons’s brand of anarchism, the “Chicago idea,” advocated the combination of anarchism and “revolutionary unionism.”²²² Spies did not, however, disavow force and violence, and his allegiance to the largest workers’ organization in Chicago, the Central Labor Union, led to the group passing a resolution that proclaimed all workers should arm themselves.²²³ Establishment Chicago newspapers, like the *Tribune* and *Times*, calumniated his name. They instructed journalists to report Spies’s most “inflammatory” and violent remarks to build public opposition to anarchism.²²⁴ Throughout all of these activities, Spies touted dynamite.

But Chicago’s anarchists did more than talk bombs, they possessed them. In order to make their revolutionary political agency plausible enough to substantiate their rhetorical threats, they had to have the capacity to wreak widespread destruction. Chicago’s anarchists believed that the workers should arm themselves for defense against state aggression and for the ultimate day of revolution. Dynamite thus became almost as prevalent in small arsenals as in speech. Co-defendant Louis Lingg spent most of his short time in America before the Haymarket bombing manufacturing dynamite bombs. Spies’s newspaper and an anarchist saloon offered free weapons

training.²²⁵ Spies even kept bomb parts and dynamite in his desk at the *Arbeiter-Zeitung*. When a *Daily News* reporter visited Spies's office, Spies gave the reporter a bomb casing and told him: "Take it to your boss, and tell him we have nine thousand more like it—only loaded."²²⁶ The increasing prevalence of dynamite in Chicago and the increasing violence that occurred at various strike-related conflicts throughout Chicago seemed to foreshadow the bombing. "Have you any dynamite about you?" the *Times*'s Edgar Owen asked Albert Parsons as a group of mainstream press reporters joked with the Parsons family just before gathering at Haymarket.²²⁷

The explosion of the dynamite bomb at the May 4th Haymarket rally differentiated Spies's most recent bomb talking from any of his previous utterances. The explosion marked the exact moment when, after years of calling workers to arms, he could be accused of inciting violence. He called for bloodshed; he called for dynamite. At long last, at Haymarket, from his vantage on the speakers' wagon, Spies witnessed both. Someone in their audience, perhaps, took his words in a literal sense.²²⁸ During the subsequent trial, the defendants and their attorneys often admitted that they advocated social revolution, that the revolution would probably necessitate violence, and that the best weapon with which to fight the state was dynamite. Rather, the essential issue debated in Judge Gary's court was thus whether the defendants could be held accountable as murderous conspirators when so many people in Chicago, across the U.S., and around the world talked bombs as much or more than they did.

With bomb talking was so commonplace in Chicago in 1886, Spies and his co-defendants were incredulous that the state used their "incendiary" language to charge them with conspiracy. In his courtroom address, Spies noted the hypocrisy of accusing him of publishing articles about how to make dynamite bombs when almost every paper in Chicago, whether radical or establishment, had published almost identical material.²²⁹ "But," says the State, 'you have

published articles on the manufacture of dynamite and bombs.’ Show me a daily paper in this city that has not published similar articles!” he demanded.²³⁰ Spies had a point. In February, 1885, the *Tribune* detailed how to make what we now call “time bombs,” as well as hat bombs, bottle bombs, fuse-less grenades, various types of gunpowder, and dynamite bombs.²³¹ The *Chicago Times* recommended dynamiting strikers with hand grenades.²³²

Yet, without his bomb talking the state had no means to try Spies for conspiracy. Lacking reliable witnesses, pertinent physical evidence, and the identity of the bomber, the prosecution focused on Spies’s speeches and writings as the only causal connection between him and the Haymarket bomb. Numerous editions of the *Arbeiter-Zeitung* and *The Alarm* became state’s evidence, along with Most’s *Revolutionäre Kriegswissenschaft*, because they contained explicit instructions about how to build dynamite bombs. Spies had even published an editorial in *Arbeiter-Zeitung* on the day of the Haymarket bombing to decry the killings at the McCormick clash, which read “with good weapons and one single dynamite bomb, not one of the murderers would have escaped his well-deserved fate.”²³³ Spies published a comparable article by Schwab in the same issue that also demanded violent revenge. Witnesses testified to the threats made by the defendants in speeches throughout the city.²³⁴ Although the amount of threatening literature was voluminous, the defense team noted that all such material “was *general in its character*,” and therefore so-called incendiary articles had no direct connection to the Haymarket bombing.²³⁵ Rather, they claimed the prosecution introduced these writings to appeal to the jury’s fears and prejudices.²³⁶

In addition to anarchist literature, the state produced ample physical evidence to sway the jury.²³⁷ The defendants’ attorneys accused the state of “parading” a large array of bomb-related artifacts and persons in front of the jury to give material presence to the defendants’ bomb

talking. In his opening argument, prosecuting attorney Ingham admitted as much: “We expect to bring into court dynamite bombs by the dozen, and until the dozens run up into barrels. No bomb which we shall trace to these defendants can have any possible legitimate purpose. We shall show by men of science that dynamite bombs cannot be used for anything else but for cowardly and atrocious murder.”²³⁸ A wide sampling of various dynamite bombs littered the courtroom’s floor during Chicago Police Captain Michael Schaack’s testimony: bomb fragments removed from policeman Mathias Degan’s corpse, bloody, shrapnel-pierced police uniforms of dubious origin, fragments of objects blown up with dynamite seized during illegal raids of suspected anarchists, photographs of random bombs, Engel’s small, unused metal furnace, and the dynamite and bomb parts that Spies kept in his desk at the *Arbeiter-Zeitung* building.²³⁹ Injured policemen displayed and described their injuries. And the jury convicted the eight men.

Dynamite was the weapon of the moment. It was prevalent both in word and in arsenals, at the Haymarket, at the trial, and beyond. And the trial did not dampen the “dynamite orators” incendiary words.²⁴⁰ It served as another platform to champion their cause, and in their final addresses to the court, the bomb talking continued. They refused to acknowledge that their calls to arms with dynamite had caused the Haymarket bombing, and several of them sounded just as incendiary upon their sentencing as they sounded before the bombing. Lingg said, “I tell you frankly and openly, I am for force. I have already told Captain Schaack, ‘If they use cannons against us, we shall use dynamite against them.’”²⁴¹ Engel said, “No power on earth can rob the workingman of his knowledge of how to make dynamite bombs—and that knowledge he possesses.”²⁴² Furthermore, “Nor do I deny, that I, too, have spoken at meetings, saying that, if every workingman had a bomb in his pocket, capitalistic rule would soon come to an end.”²⁴³ Parsons claimed, as further proof of Lingg’s innocence in manufacturing the Haymarket bomb,

that Lingg's bomb would have proven much more destructive, because as he twice said, "dynamite is an explosive which annihilates its victims."²⁴⁴

Spies, too, did not cease talking bombs. Rather, he drew from the common international dynamite discourse as a source of rhetorical invention. In his address to the court, Spies asserted that, "From their [the state's] testimony one is forced to conclude that we had, in our speeches and publications, preached nothing else but destruction and dynamite."²⁴⁵ Spies embraced the accusation. "We have preached dynamite!" he proclaimed. "We have said to the toilers, that science had penetrated the mystery of nature—that from Jove's head has sprung a Minerva—dynamite!"²⁴⁶ Dynamite, hailed as the means to annihilate capitalism and as the means to preserve the working class, pushed Spies into a direct confrontation with the Malthusian Paradox. The fate of anarchism as a viable American political movement was in 1886 tied to the success or failure of bomb talking to motivate revolution. Anarchism would live or die by bomb talking. Spies had lived by bomb talking. And he would die from bomb talking.

August Spies's Address to the Court: Turnaround Arguments, The Polysemy of Dynamite, and Self-Martyrdom

Throughout the trial, bomb talking and the Haymarket dynamite bomb had combined to prove the conspiratorial guilt of Spies. The prosecution's case hinged upon the connection between Spies's rhetoric and the unknown bomber's weapon. When Judge Gary denied the defense's request for a retrial, held up the court's death sentences, and granted the convicted men a chance to address the court on October 7, 1886, the audience was attuned to how Spies would speak about dynamite. Spies delivered the first speech, speaking for about two hours. He argued that he had nothing to do with the bomb throwing; that the bomber remained unknown, making a

charge of conspiracy impossible to prove; that Chicago's police force was corrupt and had kidnapped his main alibi; that the state had mounted an illegal prosecution by buying the witnesses who testified against him, and by handpicking a jury that would convict regardless of the case presented; that the prosecution tried them for believing in anarchism rather than for murder; and that the state would murder innocent men.²⁴⁷

But Spies did more. In a context where anarchists, capitalists, journalists, and industry could use dynamite for simultaneous contested military, political, and symbolic purposes, he made important technological arguments that demonstrated how both the ubiquity of dynamite and that of bomb talking created not only volatile and unstable situations, but also the occasion for volatile and unstable speech. The ubiquity of bomb talking brought instability to language as words used so profusely took on literal, symbolic, ironical, and historical senses. As an anarchist agitator, Spies used this instability rhetorically to create political instability. And Spies found in the instability of dynamite a model for how to negotiate the logical instability of the Malthusian Paradox. The presence of paradox empowered Spies to delve into logical instability in his courtroom address, both pointing out its presence and exploiting it with his bomb talking.

In his address to the court, Spies exploited the rhetorical and logical instability of bomb talking in several ways. He used this instability to construct turnaround arguments about the power of dynamite to either annihilate capitalists and anarchists or to preserve them. He articulated that the various rhetorical purposes and meanings of bomb talking produced a multitude of meanings, some of which were beyond his control. And Spies cultivated himself as a martyr whose executed body was freighted with the paradoxical tensions of whether workers would be technologically destroyed or liberated.

Turnaround Arguments

One of the curious possibilities afforded by paradox in general, and the Malthusian Paradox in particular, is that of *antistrephon*, or turning arguments against each other. Because paradox holds two seemingly opposing positions at once, it facilitates rhetorical turning, changes in argumentative direction, and the appropriation of argumentation and evidence to prove competing claims. By using turnaround arguments, rhetors may do more than negotiate paradox. They may exploit it. Spies used the logical instability afforded by paradox to construct turnaround arguments about how dynamite facilitated political destruction and preservation in order to situate the legal relationship of revolutionaries to the government. What the state viewed as preservative – capitalism – Spies viewed as destructive, and what the state viewed as destructive – anarchism – Spies viewed as preservative. Spies therefore turned the state’s evidence against him into evidence against the state. As Spies spun defense from attack and spun attack from defense, the concepts of “destruction” and “preservation” swirled around each other with increasing intensity. “Destruction,” according to Spies, meant capitalism’s annihilation of workers, while “destruction,” according to the state, meant anarchism’s annihilation of democratic society. “Preservation,” according to Spies, meant preserving the masses by annihilating the forces of capitalism, while “preservation,” for the state, meant preserving the masses by annihilating the labor movement and anarchism.

Spies first indicated that he would paradoxically turn the state’s case into his defense, and to turn his defense into an attack on the state, by quoting Marino Faliero, a Doge of Venice.²⁴⁸ “*My defense is your accusation; the causes of my alleged crime your history!*”²⁴⁹ For Spies, the state was, because of its violent maintenance of capitalism, guiltier than Spies of provoking the Haymarket bombing. Dynamite served as the material proof of this turnaround. In its most basic

form Spies expressed the commonplace of bomb talking that the explosive will facilitate the ultimate destruction or preservation of society and civilization depending on which political system ends up victorious.

As his address unfolded, Spies used *antistrephon* to turn one of the state's accusations about his involvement with dynamite conspiracies into an argument that instead the state was conspiring to commit violence. The strike against the Hocking Valley Coal and Iron Company in 1884 was presented by the state as proof of the barbarity of the labor movement at the same time it was presented by Spies as proof of capitalism's barbarity. The prosecution charged Spies with conspiring to transport dynamite to the strikers. Spies paraphrased the prosecution, agreeing that he "might have destroyed thousands of innocent lives in the Hocking Valley with that dynamite."²⁵⁰ Whether the event represented capitalist or anarchist destruction was up for grabs amidst the instability of bomb talking, and Spies seized this as his own evidence against the state. "I saw hundreds of lives in the process of slow destruction, gradual destruction," he exclaimed. "There was no dynamite, nor were they Anarchists who did that diabolical work. It was the work of a party of highly respectable monopolists, law-abiding citizens, if you please."²⁵¹ Spies thus exploited the Paradox to show that dynamite, far from representing the destruction of society, could preserve society. The danger to society posed by an idle mine could not compare to the danger to society posed by killing its productive population. The Hocking Valley strike, and even the would-have-been use of dynamite by strikers, was thus the true preservative action.

As anarchists wanted to overthrow the state and destroy capitalism the state depicted them as despicable "monsters" bent on destroying society. Spies once again exploited the instability of bomb talking to reverse the charge with a rhetorical turn, transforming the monster metaphor into a description of capitalist society. According to Spies, a system of power that used

“fiendish bloodsucking” and “child eating” to preserve the state did not deserve preservation, but rather destruction.²⁵² “Anarchism does not mean bloodshed; does not mean robbery, arson, etc.” he said. Rather such “monstrosities” are “characteristic features of capitalism.”²⁵³ Anarchism did not appear quite so destructive when compared to the atrocities committed by the industrial capitalist “fiend” against innocent children. By conveying total enmity, the monster metaphor helped Spies imbue his adversaries with sinister and diabolical attributes. The “monster” had no positive attributes; the “monster” had no preservative power; the “monster” intended only bloodshed; the “fiend” attacked with no mercy; the “monster” was industrial capitalism. As demonstrated by Hocking Valley, any pretense toward societal preservation on the part of the state was, according to Spies, a dangerous ruse. The “demons of hell” would thus admire the success of their most conspicuous compatriot – the U.S. government.²⁵⁴

After using the instability of bomb talking both to turn around the state’s evidence against Spies into evidence against the state, and to turn the “monster” metaphor for anarchism into a metaphor for capitalism, Spies once again exploited the logical instability of the Paradox to redefine American society as, first and foremost, destructive. Breaking conventional wisdom that Americans are “free,” Spies elaborated that what the state wanted to preserve as the basis of societal organization – industrial capitalism’s “monstrous” effects on workers – proved much more destructive than anarchist dynamite bombs. In contrast to the small magnitude of violence that occurred at Haymarket, Spies spoke of American government:

It means the preservation of the systematic destruction of children and women in factories. It means the preservation of enforced idleness of large armies of men, and their degradation. It means the preservation of intemperance, and sexual as well as intellectual prostitution. It means the preservation of misery, want, and servility on the one hand, and the dangerous accumulation of spoils, idleness, voluptuousness and tyranny on the other. It means the preservation of vice in every form. And last but not least, it means the preservation of the class struggle, of strikes, riots and bloodshed.²⁵⁵

The vast array of mechanical power monopolized by corporations and politicians—industrial and agricultural machines, railroads, telegraphs, telephones, steam power, Gatling guns, and gallows—demonstrated to the court that capitalists and the government were “the conspirators and destructionists,” rather than anarchists.²⁵⁶ For these reasons, Spies lauded the bombing. “If I had thrown that bomb, or had caused it to be thrown, or had known of it, I would not hesitate a moment to say so. It is true that a number of lives were lost—many were wounded. But hundreds of lives were thereby saved! But for that bomb, there would have been a hundred widows and hundreds of orphans where now there are few,” he proclaimed.²⁵⁷ Spies disavowed any personal bloodlust, but he refused to condemn the Haymarket bombing. The bombing, although in the end futile, was an act of worker preservation aimed at arresting the violent oppression of workers. By exploiting the Malthusian Paradox, Spies’s *antistrephon* thus turned the state’s evidence, the “monster” metaphor, and the accusation of committing wanton destruction against the state.

The Polysemy of Bomb Talking

Spies refused to disavow the Haymarket bombing, but he did disavow that his bomb talking had any specific effect on the bomber. Spies spoke of dynamite for multiple rhetorical purposes, only one of which was meant to encourage immediate revolutionary bloodshed. When Spies said, “dynamite!” or “to arms!” the sheer ubiquity of bomb talking and its rhetorical instability had imbued these terms with multiple and divergent meanings. Spies exploited this polysemous instability to espouse dynamite: he called upon workers to arm themselves with dynamite, he called upon dynamite for self-defense, he called upon workers to stockpile dynamite for the future revolution, he invoked dynamite as a metaphor to symbolize the abstract concept of revolution, and, when the perfect time would at long last arise, he spoke of dynamite

as the means to overthrow of capitalism. Only in this last sense were his words meant to be taken literally as an exhortation to throw a dynamite bomb (and Spies had said in the days leading up to the Haymarket bombing that it was not yet time for revolutionary violence). Yet, the polysemous character of Spies's prolific bomb talking meant that when he "preached dynamite" his incendiary words were open to a wide range of interpretations, especially during the tumultuousness of an event like the police advance on the Haymarket rally. When the Haymarket bomber went astray by acting on anarchist exhortations to dynamite capitalists, it produced a surprising literalization of Spies's bomb talking. The subsequent debate at the trial about whether to understand Spies's bomb talking as literal or not indicated that, regardless of intent, when he spoke of "dynamite," interpretation took place in the hazy interzone of meaning created by polysemy.

When Judge Gary's court insisted that Spies's bomb talking could only be interpreted in a strict sense, it insisted, however indirectly, that it would ensure that anarchist bomb talking would be stabilized, literalized, and thus criminalized. Understanding Spies's dynamite oratory as literal benefitted the prosecution's case by establishing a causal link between Spies's incendiary language and the Haymarket bombing. The literal reading equated the action of the bomb-thrower with action of the bomb-talker.²⁵⁸ The court's insistence on a literal reading of Spies's bomb talking, however, rendered the various other polysemous meanings inherent to Spies's dynamite oratory inconsequential to the Haymarket bombing. Therefore in his address to the court, Spies attempted to prove his innocence by identifying the polysemous instability of bomb talking. But he also exploited this rhetorical instability to draw attention to the underlying revolutionary causes of the Haymarket bombing by reestablishing the polysemous meanings of "dynamite" as paradoxically the agent of the workers annihilation and their preservation.

In order to prove there was more to his bomb talking than the literal, Spies invoked a temporal distinction between the present urgent need for self-defense and the distant revolutionary future, both of which dynamite would facilitate. He said, “I may have told that individual who appeared here as a witness that the workingmen should procure arms, as force would in all probability be the *ultima ratio*; and that in Chicago there were so and so many armed, but I certainly did not say that we proposed to ‘inaugurate the social revolution.’”²⁵⁹ In fact, he did call for revolution, but not for immediate revolution. The bomber, Spies suggested, misunderstood Spies’s call to arms. Without massive widespread support throughout Chicago (to form the heralded Chicago Commune), or the country (a general strike), the state would crush the labor movement. Spies therefore used “dynamite” in a polysemous sense. Spies’s bomb talking would only transform from meaning self-defense into literal exhortation to commit immediate revolutionary violence when workers had attained the support and means to overthrow capitalism, and not until then. But inherent to the necessity of self-defense was the contributory meaning of Spies’s bomb talking that offensive dynamiting would take place at some point.

With so much bomb talking, the lack of anarchist violence had somewhat retracted the symbol of dynamite into an abstract concept of revolution, a concept that always seemed to get pushed further into the future.²⁶⁰ Indeed, dynamite had come to symbolize the concept of revolution as a metaphor. Spies drew attention to the instability of his bomb talking by contextualizing it with other violent ironic metaphors. He reported that the *Fon du Lac Commonwealth* demanded “To arms, Republicans!” Spies then quoted the paper’s list of deeds that Republicans should commit to keep Democrats from winning an upcoming election: “Every Republican in Wisconsin should go armed to the polls next election day. The grain stacks,

houses and barns of active Democrats should be burned; their children burned and their wives outraged...shoot every one of these base cowards and agitators...Burn them.”²⁶¹ Spies expressed chagrin that his bomb talking led to a death sentence when this list of atrocities went unnoticed, much less unpunished, by the authorities. If the court considered the *Commonwealth*'s exhortation to murder their political opponents' children and rape their wives a metaphor for voting, then Spies demanded an explanation why his metaphors should receive a literal interpretation. “How does the *Arbeiter-Zeitung* compare with this?”²⁶² Spies's dynamite oratory was no more “incendiary” than typical political discourse and just as banal, but the “Republican” example indicated how the polysemous instability of violent rhetoric became mobilized for contested political purposes. The government would authorize the validity of interpreting the *Commonwealth*'s exhortations to commit atrocities as ironic metaphors, but not Spies's. Thus by evidencing the *Commonwealth*'s ironic metaphor, Spies drew attention to the injustice of convicting him according to a literal reading of his bomb talking when that was just one of many possible interpretations. His symbolic use of dynamite was just another polysemous, albeit ironic, indication that dynamite would eventually save the working class from capitalist annihilation.

Given the futurity of the revolution, Spies further distanced himself from a literal interpretation of his bomb talking by minimizing it as an insignificant and figural instant in a long inevitable historical progression. In contrast to the authorities who “maintain that they can call a halt to progress, and dictate a standstill to the eternal forces of which they themselves are but the whimsical creation,” Spies claimed that everyone “cannot retreat even if we would. The force of circumstances drives us on to Socialism.”²⁶³ In the context of the trial, Spies was arguing that he was both accountable and not accountable for the Haymarket. On one hand, he in

particular was accountable for the Haymarket bombing by being an agitator who encouraged violence as a general tendency in revolutions, even though he discouraged it in Chicago. On the other hand, he was not accountable because he was a mere minor agent in a larger uncontrollable historical movement. According to this historicism, the state should not hold him accountable for heralding what history dictated was going to happen regardless of whether or not Spies was an agitator. In the grand historical scheme, his bomb talking was as “whimsical” as his adversaries’ rhetoric, and therefore it was no more meant to be understood literally than anyone else’s. Spies thus disclaimed any responsibility for “ultimate” revolution, because that responsibility does not rest with one person, one call to arms, and one proposal to “inaugurate” it. Spies thus exploited the polysemy of bomb talking to depict himself as both innocent and guilty at the same time. He did “preach dynamite,” but he did not preach dynamiting Haymarket.

Self-Cultivated Martyrdom

Even though Spies exploited the instability of bomb talking to prove himself innocent of conspiring to blow up Haymarket, he also argued that he was *the most guilty* party. Concomitant to his attempt to downplay the significance of his pre-trial bomb talking, Spies amplified the significance of his execution by cultivating his martyrdom. With his last words before the court Spies compared himself to other martyrs whose executions served as embodied synecdoches for various causes. Spies said, “Truth crucified in Socrates, in Christ, in Giordano Bruno, in Huss, Galileo, still lives—they and others whose number is legion have preceded us on this path. We are ready to follow!”²⁶⁴ Such analogies were another commonplace that inflected Haymarket discourse. Just as these historical executions served as synecdoches of the ideals of philosophy, religion, and science, Spies desired that his own death would function as an embodied

synecdoche for anarchism. His death would represent the injustices perpetrated against workers worldwide and thereby reveal the truth of anarchist principles.²⁶⁵ All of the Haymarket defendants expressed a willingness to die if their executions would benefit the labor movement, and in various ways, Parsons, Neebe, Lingg, Engel, Fischer, and Fielden cultivated their martyrdom in their addresses and elsewhere.²⁶⁶ However, Spies's words had a more traceable legacy in the transformation of the eight men into "the Chicago Martyrs." More so than his co-defendants, he demanded to be a martyr. And on the eve of his hanging, rather than asking for commutation, Spies asked Governor Oglesby to execute him as a "sacrifice" to save the other condemned men. He knew that his fate represented the fate of everyone if they failed to revolt. His execution, by representing the fate of all workers in the unstoppable progression toward capitalism's extinction, seemed like it could resolve the Malthusian Paradox by bringing coherence to an otherwise incoherent situation. For if neither bomb talking nor bomb throwing caused the overthrow of capitalism, then at least he could memorialize the costs of that change via martyrdom.

Spies argued that his execution would become an important causal event in the course of history by framing it as a lesson for workers that they must fight to obtain justice. Whereas he argued his bomb talking was insignificant, his execution would be momentous. Rather than stopping political dissent his hanging would impel it. Spies stated that "The contemplated murder of eight men, whose only crime is that they have dared to speak the truth, may open the eyes of these suffering millions; may wake them up."²⁶⁷ The singular Haymarket case thereby represented the plight of all workers who suffer from capitalist and governmental aggression. "One" became a synecdoche for "millions" in a rhetorical process wherein, according to rhetorician Richard Lanham, "experience is described in terms of other experience, but at a

different level of magnification.”²⁶⁸ The experience of one transferred to the experiences of millions, because as Spies suffered bodily death, millions suffered the deaths of justice and liberty. In the words of Kenneth Burke, Spies desired to become the “synecdochic representative” of the whole anarchist movement.”²⁶⁹ The significance of martyrdom thus derived from the capacity of one death to get amplified to such an enormous scale that it became representative of almost everyone’s lives. The millions who witnessed his execution magnified his death through memory and the repetition of observation rather than repeating an act of violence. His martyrdom used a moment of destruction to grant witnesses awareness, understanding, and insight about how to work for future preservation.

Spies used his execution to warn the state that his death would signal capitalism’s death, and for that goal he demanded that the state must kill him. He concluded his address:

And if you think that you can crush out these ideas that are gaining ground more and more every day; if you think you can crush them out by sending us to the gallows; if you would once more have people suffer the penalty of death because they have dared to tell the truth—and I defy you to show us where we have told a lie—I say if death is the penalty for proclaiming the truth, then I will proudly and defiantly pay the costly price! Call your hangman!²⁷⁰

By embracing the concept of being a bomb-throwing conspirator while at the same time denying his guilt; he applauded the ideals for which he was sentenced while decrying the ideals by which he was sentenced. In this way, to quote Stephen Browne, violence provided “a symbolic means to transform events and ideas into a new rationale for human relations and collective action.”²⁷¹

The destruction of one person would transform society by compelling the preservation of all workers through revolution. Spies demanded death, because it would hasten the destruction of the system that killed him. He called the hangman to arms just like he called the workers to arms for both would serve the same purpose – advancing the demise of capitalism. Spies’s bid for martyrdom was thus warranted by unalterable path of history, and thus he left any paradoxical

ambiguities about whether or not workers would end of getting annihilated or liberated for history to resolve.

Spies's last words upon the gallows resonated even more than his address. Before Spies died after several minutes of writhing in the noose, he said: "There will come a time when our silence will be more powerful than the voices you strangle today."²⁷² With his martyrdom no longer in his control, Spies's sudden silence got amplified to a deafening noise when "millions" of witnesses repeated his final words again and again. Much more than his preaching dynamite, the sudden, violent absence of his bomb talking became symbolic of capitalist oppression. The single statement became disembodied upon Spies's death but re-embodied whenever other people utter his last words anew. Moreover, his brief statement persisted and proliferated as his successors in the labor movement turned his last words into an international slogan to motivate agitation. More so than any one editorial or speech, news of his execution would circulate to a much wider audience owing to the audaciousness of the injustice perpetrated against him.²⁷³ He had, as he planned, become a martyr, a synecdoche for all revolution.

Because Judge Gary's court scrutinized Spies's rhetoric as a primary element of its prosecution, Spies had a platform from which to probe the complexities and instabilities of bomb talking. His rhetorical tactics revealed that the power of any given weapon is much greater than its material design. The power of any weapon derives from a combination of its discharge in battle and in speech. A weapon represents much more than its own material existence, but the ways that rhetoric helps to freight the deployment of weapons with psychological, cultural, and ideological weight. And through the coupling of Spies and dynamite bomb, rhetor and weapon, Spies demonstrated how bomb talking was imbued with both rhetorical and logical instability, and how Spies exploited this instability to negotiate the Malthusian Paradox. His rhetorical and

argumentative *antistrephon*, afforded by bomb talking's instability, argued that anarchist destruction would preserve the working classes from capitalist destruction. His deployment of dynamite's polysemy showed how bomb talking could be simultaneously literal, symbolic, and historically destined. And his self-cultivation of martyrdom framed personal destruction as class preservation.

Dynamite Discourse and the Political Limits of Bomb Talking

With “anarchy on trial,” as lead prosecutor Grinnell put it in his closing statement, the Haymarket event resembled a microcosm of how weapons and rhetoric together arbitrated political power. Spies confronted his audience with a serious choice: it either had to stand with Spies and the labor movement by admitting the fallibility and moral failings of a system that would hang innocent men, or it had to acquiesce to capitalist oppression. But for all the anarchists' calls to dynamite capitalism and trust in dynamite as the weapon that would facilitate social change, the moment a dynamite bomb exploded in Haymarket, it failed to spur revolution. Despite incessant heralding, the moment for symbolic violence had not arrived. The bomb, awaited with eagerness and cajoled by so many, neither inspired a “Chicago Commune” nor a national uprising, and much less did it inspire the overthrow of capitalism. Instead the Haymarket bomb gave the government the justification it needed to suppress the anarchist press and make examples of its workers, writers, and editors. As literary critic Jeffery A. Clymer wrote, bomb talking empowered agitators to “gauge the possibilities for—and limits on—social action and individual agency in the emerging mass culture produced by industrial and finance capitalism.”²⁷⁴ After the Haymarket trial, the possibilities and limits of bomb talking on political agency proved severe and fellow agitators judged their bomb talking a failure. The martyrdom of

four men was no substitute for widespread social change, and their executions demonstrated that, for revolutionaries, bomb talking was self-defeating rhetoric.

In one simple respect, bomb talking was self-defeating because it misrepresented dynamite's technical capacity to wreak destruction, and as a correlate, the misrepresentation of dynamite's destructive power misrepresented the ability of any revolutionary who wielded it. When a dynamite bomb exploded, the limited amount of damage wrought exposed the commonplace amplification of dynamite's destructive power as mere hyperbole. With five times more explosive power than gunpowder, dynamite was described as capable of blowing up everything and everyone in a single blast.²⁷⁵ *The Alarm*, for example, stated that "One man armed with a dynamite bomb is equal to one regiment of militia, when it is used at the right time and place...One dynamite bomb properly placed will destroy a regiment of soldiers."²⁷⁶ In his oft-referenced description of dynamite, U.S. Army General Philip Sheridan noted that people could conceal bombs in their pockets. With these "pocket" bombs, "whole armies and cities could be destroyed...banks, United States sub-treasuries, public buildings and large mercantile houses can be readily demolished, and the commerce of entire cities destroyed."²⁷⁷ Dynamite may have seemed to even the power disparity between workers and the government, but it did not in fact do so. One bomb carried in a pocket did not cause such massive death and destruction even when exploded in the midst of a police regiment's tight formation at Haymarket. Dynamite did not possess an unlimited capacity to annihilate, and therefore neither did the revolutionaries who touted, manufactured, and used it. The technical capacity of the weapon showed the bomb throwing revolutionaries would get crushed by a well-armed state military.

The threat of random dynamite bombings stoked public fear nonetheless, but the fear proved self-defeating for anarchism. The combined threat of rhetoric and weapon constituted

dynamite as an important anxiety-producing symbol for anarchist political thought that was, in the estimation of Clymer, more powerful than the Haymarket bomb itself.²⁷⁸ And public fear of dynamite in Chicago after the Haymarket bombing was rampant.²⁷⁹ Chicago residents testified to the city's anxiety. Lawyer and judge Samuel P. McConnell, who heard the Haymarket explosion on his way home from an evening out with his wife, reminisced that on the morning after the bombing, "The general opinion prevailed that there had been planned an uprising of anarchists and that no one was safe...It was several weeks...before the fright and hysteria subsided."²⁸⁰

The bomb and appeals to force proved too fearful, however. Rather than causing the public to fear the state, the anxiety produced by bomb talking turned possible supporters into adversaries. In a letter to Lucy Parsons, Chicago socialist labor agitator George Schilling wrote, "The revenge circular of August Spies was met by the revenge of the public mind, terrorized with fear until it reeled like a drunken man, and in its frenzy swept away the safeguards of the law and turned its officers into pliant tools yielding to its will."²⁸¹ Schilling concluded by calling the Chicago anarchists' rhetorical tactics "mistaken methods," because they "lead to greater despotism," and "terrorize the public mind and threaten the stability of society with violence," while such "agitation inspires fear; it shocks the public mind and conscience."²⁸² Thus, the use of bomb talking to provoke anxiety proved self-defeating. It further limited their political agency by indicating that anarchism would be antithetical to people who wanted to inhabit a peaceful society.

The anarchists' mobilization of dynamite as *the* agent of world-historical change proved additionally self-defeating for their movement, because it misrepresented the usefulness of the weapon to cause political change. Bomb talking often granted the weapon the capacity to not only wipe out a city block or a regiment of soldiers, but to wipe out all of civilization. The wife

of lead defense attorney William P. Black wrote to the *Daily News* that dynamite “will soon depopulate the earth.”²⁸³ Revolution seemed urgent for “A girdle of dynamite encircles the world,” wrote Johann Most.²⁸⁴ The fate of the labor movement and the fate of capitalism seemed to teeter on the brink of destruction along with untold numbers of lives. Dynamite seemed to possess an inordinate amount of power to transform human relations. But it did not do so. The revolution was crushed before it even began.

Instead, anarchism’s embrace of dynamite ended up empowering further state suppression of worker politics. Bomb talking accomplished the opposite of what the anarchists set out to do – it strengthened capitalism and restricted the autonomy of their political agency. William Holmes wrote in 1892 that it was undesirable for anarchists and labor advocates to “extol the excellence of dynamite as a factor in the coming crisis,” because “Much of this kind of agitation we have had in the past. And what have been its legitimate fruits? The scorn and hatred of the very class (the working people) whom we most desire to win; the bitter enmity and persecution of the authorities; the contempt of capitalists; and the antagonism of all classes.”²⁸⁵ After Haymarket, anarchism’s enemies employed one of Spies’s rhetorical tactics, *antistrephon*, to turn the symbol of dynamite against its most vocal advocates. New York labor journalist John Swinton noted that the “enemies of the labor movement” could use the Haymarket dynamite bomb as a potent symbol to deride any type of worker activism as dangerous and unappealing.²⁸⁶ The police, the mainstream press, and the prosecution did just that, using the potency of dynamite symbolism to build and maintain public opinion against the accused bomb conspirators. Police interviewed at Haymarket after the bombing showed no remorse for their attack on the rally and its participants who had been “preaching dynamite for years.”²⁸⁷ The *Chicago Times* called for the extermination of the “slavic [sic] wolves” who perpetrated the

bombing to avenge the dead policemen. The authorities had succeeded at turning the “dynamite” symbol against anarchism. The “power” of one dynamite bomb held the city hostage for fear of more bombs, and only after the executions of Spies, Parsons, Fischer, and Engel did the fervor in Chicago subside. Thus, rather than hastening the inevitable social revolution, bomb talking retarded it. Political stabilization accompanied rhetorical stabilization.

The limitation of “dynamite’s” capacity to inaugurate revolution pushed back on Black Friday. Rather than liberation, bomb talking brought destruction to the Chicago anarchists. Haymarket occurred at the climax of dynamite’s symbolic importance for anarchism, and Black Friday marked the virtual end of commonplace anarchist bomb talking. Looking back at the effects of the trial on Chicago’s “radical press,” historian of anarchism Bruce C. Nelson wrote: “A decade of repression changed the content and trajectory of the radical press [after Haymarket]. The inflammatory rhetoric, the ads for the *Lehr-und-Wehr Verein*, the articles on dynamite, even the initials IWPA, disappeared immediately.”²⁸⁸ For anarchism, its embracement of dynamite culminated in anarchism’s getting forever labeled a political movement that is, above all else, violent.²⁸⁹ Paradoxically, anarchist bomb talking ended up defeating anarchism rather than annihilating capitalism. And for that reason, bomb talking failed to resolve the paradox.

Conclusion

Governor John Peter Altgeld later pardoned Fielden, Schwab, and Neebe, as well as the five dead men, in June 1893. The stereotyped xenophobic image of conspiratorial anarchists plotting to destroy property and kill capitalists lives on though. The Haymarket bomb transformed dynamite, as a metaphor for general revolution and the pinnacle of political thought

in the hands of anarchists, into the literal representation of indiscriminate physical destruction and the metaphorical nadir of political thought. The appeals to force and appeals to fear inherent in bomb talking succeeded in instilling widespread fear of the idea of anarchism and of the word “anarchy.” Anarchism has remained an underground, disparaged, and almost powerless political movement. Mainstream media persist in labeling any window broken during a protest the work of “anarchists.”

More durable than anarchist political thought, the common international discourse in which Spies participated persisted despite the waning importance of dynamite bombs. New weapons inhabited it, though. If the “public” does not still live in fear of anarchist bombs, extremist right-wing terrorists’ fertilizer truck bombs and roadside “improvised explosive devices” provide a new fearsome threat of random violence. In retrospect, Haymarket bomb talking demonstrates that current terrorism discourse reproduces the era’s commonplaces. With a substitution of names, places, and weapons, the rhetoric of Spies and his contemporaries could serve as a primer on terrorism rhetoric and politics after 9/11.²⁹⁰ Although IEDs have replaced dynamite as terrorists’ weapon of choice, and “Islamic fundamentalists” have replaced anarchists as the frightening enemy, the ways terrorists, government officials, and the media talk about weapons shows that they still negotiate the Paradox by capitalizing on the instability of weapons rhetoric. As capitalism and fundamentalist Islam, locked in disagreement about which ideology preserves and destroys civilization, continue to generate wars and aggression, news media resound with talk of cowardly foreigners bent on destroying civilization with ultimate weapons. Occasional bombings and phantom WMD arsenals continue to serve as singular justifications for long wars of occupation and divisive foreign policies.

In terms of the longitudinal history of weapons rhetoric, Spies's tactics were noteworthy in several ways. Similar to his exaggeration of dynamite's importance in world affairs, the subsequent case studies demonstrate that amplification of a weapon's destructive power well beyond its physical power to destroy were commonplaces of chemical warfare and atomic bomb discourses. Turnaround arguments would continue to circle around the defensive and offensive aspects of military activities and the theory of deterrence. The symbolic power of "dynamite" became supplanted in importance as, in turn, "gas" and "the Bomb" became ultimate weapons in dynamite's stead. Spies's invocation of dynamite showed how language could spill over into the realm of physical destruction and how physical destruction could spill over into the realm of language. Bomb talking was not just symbolic violence, but somehow constitutive of bloodshed in the inscrutable space between the literal and figural meanings created by the word "dynamite." In the end, a remarkable product of Spies's self-defeating bomb talking was the stabilization of bomb talking. After the Haymarket trial's criminalization of bomb talking, talk of revolutionary dynamite was shunned. Bomb talking's polysemy was reduced to a kneejerk indicator of wanton anarchist terror, and its instability was brought under control and stabilized. With anarchism all but defeated, and dynamite discourse stabilized, the state and capitalism were empowered to use weapons rhetoric to enforce the political status quo. In the next chapter, I show how two chemical warfare textbook writers did just that; Maj. Gen. Amos A. Fries and Clarence J. West relied on rhetorical stability, rather than instability, to navigate the paradoxes of mustard gas.

¹⁷⁸ Spies, "Address of August Spies," 5.

¹⁷⁹ "REVENGE!" was added by the *Arbeiter-Zeitung's* typesetter, Hermann Pudewa. Avrich *The Haymarket Tragedy*, 190. My overview of the Haymarket bombing is based on Paul Avrich's *The Haymarket Tragedy* and James Green's *Death in the Haymarket*.

¹⁸⁰ "A Hellish Deed," *Chicago Tribune*, May 5, 1886.

¹⁸¹ Avrich, *The Haymarket Tragedy*, 188.

¹⁸² Spies, "Autobiographical Sketch," 35.

¹⁸³ Spies, "Autobiographical Sketch," 37; Avrich, *The Haymarket Tragedy*, 181-184.

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- ¹⁸⁴ Spies printed 2,500 copies of the revenge circular, and about half of them were dropped off at workers' haunts throughout the city. Avrigh, *The Haymarket Tragedy*, 191.
- ¹⁸⁵ Reproduced in Avrigh, *The Haymarket Tragedy*, 190 and illustration 11.
- ¹⁸⁶ Quoted in Avrigh, *The Haymarket Tragedy*, 202.
- ¹⁸⁷ Quoted in Avrigh, *The Haymarket Tragedy*, 203.
- ¹⁸⁸ Quoted in Green, *Death in the Haymarket*, 185.
- ¹⁸⁹ The Haymarket bombing did not mark the first use of dynamite during a labor conflict in the U.S., but it did mark the first fatal bombing. See Avrigh, *The Haymarket Tragedy*, 168.
- ¹⁹⁰ Black, Salomon, and Zeisler, *Brief and Argument*, 122.
- ¹⁹¹ Quoted in Avrigh, *The Haymarket Tragedy*, 209.
- ¹⁹² Louis Adamic even used "Dynamite" as a synecdoche for the title of his chronicle of American class conflicts.
- ¹⁹³ During the Crimean War (1853-1856), British Admiral Charles Napier reported that "the Gulf of Finland is full of infernal machines," referring to sea mines designed manufactured by Immanuel Nobel. Quoted in Bergengren, *Alfred Nobel*, 18. Spies and Parsons both used the term in their addresses to the court, as did Grinnell in his opening address. Altgeld, et. al., *The Chicago Martyrs*, 3 and 101-103; and Schaack, *Anarchy and Anarchists*, 398.
- ¹⁹⁴ In *America's Culture of Terrorism*, Jeffery A. Clymer wrote that Haymarket "became an early moment that helped inaugurate a mass-mediated discourse of disaster, atrocity, and terrorist violence" (29).
- ¹⁹⁵ Dell, "Socialism and Anarchism in Chicago," 391. Spies did not always "preach dynamite," often calling workers to other types of arms. For example, on July 4, 1885 at an IWPA rally he advised them to buy guns for their protection. By any means, the workers should arm themselves. Green, *Death in the Haymarket*, 124. In "Tract for the Times," C. L. James used the term "dynamite" as "a synecdoche to denote all the cheap and rapid agents of destruction described in Herr Most's now famous pamphlet." Reproduced in Parsons, *Anarchism*, 62. In a somewhat circular fashion, dynamite came to serve as a metaphor for the inflammatory language of the anarchists and their talk of dynamite. Also see Avrigh, *The Haymarket Tragedy*, 65.
- ¹⁹⁶ These biographical notes on Nobel and the history of dynamite are drawn from Erik Bergengren's *Alfred Nobel* and Stephen R. Bown's *A Most Damnable Invention*.
- ¹⁹⁷ Italian chemist Ascanio Sobrero invented nitroglycerine and published the first description of how to make it in 1847. MacDonald, *Historical Papers*, 160-163.
- ¹⁹⁸ Nobel said of ballistite, "for all governments a weak powder with strong influence is obviously better than a strong powder without this essential complement." Quoted in Bergengren, *Alfred Nobel*, 106.
- ¹⁹⁹ Bown, *A Most Damnable Invention*, 82.
- ²⁰⁰ Bakunin, *God and the State*, 40, emphasis removed.
- ²⁰¹ Bakunin, *God and the State*, 59.
- ²⁰² Bakunin, *God and the State*, 59.
- ²⁰³ Bakunin, *God and the State*, 62.
- ²⁰⁴ Bakunin, *Statism and Anarchy*, 159.
- ²⁰⁵ Kropotkin, "Modern Science and Anarchism," 150-152 and 168.
- ²⁰⁶ Kropotkin, "Modern Science and Anarchism," 172.
- ²⁰⁷ Kropotkin, "Anarchism," 914.
- ²⁰⁸ See Altgeld, et al., *The Chicago Martyrs*, 7, 11-14, 18-19, 31-33, 51-54, 70-71, 74, and 122.
- ²⁰⁹ In 1861 Dr. Edward Nathan-Ganz, the American delegate to the International Social Revolutionary Congress in London, recommended studying and using modern explosives.
- ²¹⁰ Most, *Revolutionäre Kriegswissenschaft*, 1 and 55.
- ²¹¹ Avrigh, *The Haymarket Tragedy*, 69 and 176; Spies, "Address of August Spies," 3; and Parsons, "Address of Albert R. Parsons," 82.
- ²¹² Most, *Revolutionäre Kriegswissenschaft*, 3-4 and 15.
- ²¹³ Avrigh, *The Haymarket Tragedy*, 57-58.
- ²¹⁴ Most, *Revolutionäre Kriegswissenschaft*, 56. Translation by Avrigh, *The Haymarket Tragedy*, 165.
- ²¹⁵ In "German Radicals in Industrial Chicago," Christine Heiss traced the history of the *Lehr-und-Wehr Verein* to groups that formed around the 1848 revolution which, in the French revolutionary tradition, further inculcated the belief that universal suffrage necessitated universal arming (208). The more material influence on the group's formation in spring 1875 was the formation of the First Regiment of the Illinois State Guard in the summer of 1874 (210). To match the Guard's standard weaponry, the *Lehr-und-Wehr Verein* armed itself with Springfield and Remington rifles (213).

²¹⁶ A “proclamation” by Gerhard Lizius in an April, 1886 edition of *The Alarm* read, “One pound of DYNAMITE is better than a bushel of BALLOTS!” Quoted in Avrigh, *The Haymarket Tragedy*, 185.

²¹⁷ Readership reached 20,000 by the mid-1880s. Avrigh named Johann Most’s *Freiheit*, *The Alarm*, and the *Arbeiter-Zeitung* the three most important of the IWPA’s publications. *The Haymarket Tragedy*, 128 and 132. Published by the Socialist Publishing Society, the *Chicagoer Arbeiter-Zeitung* emerged in 1876 from *Die Volks-Zeitung* and its Sunday edition, *Die Fackel*. As political allegiances shifted, the paper reflected the political stances of the working people’s parties, socialism, and then anarchism, and it became the organ of Chicago’s dominant Central Labor Union in 1884. In 1886, circulation was 5,780. Nelson, “*Arbeitspresse und Arbeiterbewegung*,” 82-83, 87-88, and 92. Jon Bekken argued in “The First Anarchist Daily Newspaper” that the paper should, “perhaps” be “understood as a community newspaper – written, read, owned and published by a vibrant working-class community which issued the paper for fourteen more years after returning, in 1910, to the socialist fold from which it had emerged” (4). Editorship of Chicago’s labor movement papers required much community responsibility. Labor historian Harmut Keil wrote, “The editor would be invited to address mass public meetings, speak at rallies and picnics, give the keynote address at working-class festivities, agitate in labor union and political party meetings, rally Turner societies to the support of labor, help educate children in Sunday free schools...listing the editors of the *Vorbote*, *Chicagoer Arbeiter-Zeitung*, and *Fackel*, is almost equivalent to enumerating Chicago’s outstanding labor leaders of the period.” “The German Immigrant Working Class of Chicago,” 166-167. These duties reflected the cultural importance of the paper as “the most important media of working-class culture and literature.” Keil and Ickstadt, “Elements of German Working-Class Culture,” 98. Keil wrote that “the papers took on the function of cultural media, reporting on festivities, theater performances, and concerts, and disseminating essays, poems, short stories, novels, and even plays in their pages.” “Introduction,” xviii. Keil and John B. Jentz asserted that owing to the paper’s “emphasis on information, agitation, education, and entertainment, the newspaper itself was a characteristic example of a written culture that translated the claims of the Enlightenment into political terms—it intended to combine the formation of political consciousness and group solidarity with both the entertainment and ‘higher’ education of the workingman.” *German Workers in Chicago*, 300. For an overview of the *Arbeiter-Zeitung*’s operational organization and publication history see Renate Kieseewetter’s “German American Labor Press”; and Keil and Jentz, *German Workers in Chicago*, 242-243.

²¹⁸ Avrigh reported that Spies’s replacement as editor, Albert Curlin, “found himself criticized by readers of the paper for ‘endangering the lives of the prisoners’ with his inflammatory editorials—editorials in fact written by Spies.” *The Haymarket Tragedy*, 329-330.

²¹⁹ “The Aurora Turnverein,” 165-168; and Heiss, “Popular and Working-Class German Theater in Chicago,” 194. Spies, along with another *Arbeiter-Zeitung* editor, Paul Grottkau, may have contributed to the play’s authorship. The 1888 Internationalen Arbeiter Association edition of the play credited Spies as the sole author, whereas the Soc. Publishing Society’s first edition withheld the name of the author/s with the enigmatic “von * * *” after the title. Nelson’s bibliography cited Spies as the author with Rosenberg and Grottkau in brackets. See Poore, *German-American Socialist Literature*, 103; Keil and Ickstadt “Elements of German Working-Class Culture in Chicago, 97; Nelson, *Beyond the Martyrs*, 131 and 267; and Kruger, “Cold Chicago,” 21.

²²⁰ Avrigh wrote that on May 1st “the anarchists were in the forefront of the movement, and the names of Parsons and Spies were household words among Chicago’s citizens, idolized by the workers, hated by businessmen and police.” *The Haymarket Tragedy*, 186.

²²¹ Johann Most is credited with writing the majority of the document. Avrigh, *The Haymarket Tragedy*, 135.

²²² Avrigh, *The Haymarket Tragedy*, 72-74.

²²³ The resolution read: “We urgently call upon the wage-earning class to arm itself in order to be able to put forth against their exploiters such an argument which alone can be effective: Violence...” Quoted in Foner, *The Autobiographies of the Haymarket Martyrs*, 5. Not every revolutionary group glorified dynamite, and some denounced it; but agitators in San Francisco called for revolutionary violence with dynamite, and Samuel Gompers reported that talk often turned to dynamite within Chicago’s Central Labor Union. Avrigh, *The Haymarket Tragedy*, 68-69, 94.

²²⁴ Parsons, “Address of Albert R. Parsons,” 73.

²²⁵ Nelson, “Chicago’s Socialist and Anarchist Press,” 95.

²²⁶ Quoted in Avrigh, *The Haymarket Tragedy*, 173.

²²⁷ Quoted in Avrigh, *The Haymarket Tragedy*, 201.

²²⁸ No one has yet identified the bomber. Avrigh surmised that a German shoemaker from New York, George Schwab, perhaps threw the bomb. *The Haymarket Tragedy*, 444.

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- ²²⁹ Spies, “Address of August Spies,” 3. Parsons, Fielden, and Schwab also pointed out the hypocrisy of the charges against them in comparison to the violent language of politics. Fielden, “Address of Samuel Fielden,” 45; Schwab, “Address of Michael Schwab,” 17.
- ²³⁰ Spies, “Address of August Spies,” 3.
- ²³¹ “Infernal Machines.” *Chicago Tribune*, Feb. 23, 1885. “Dynamite,” in the June 27, 1885 edition of *The Alarm* stated, “Though everybody now-a-days speaks of dynamite, that great force of civilization, some with awe, others with delight, it may be said that but few have any knowledge of the general character and nature of this explosive.”
- ²³² Avrigh, *The Haymarket Tragedy*, 33.
- ²³³ Quoted in Schaack, *Anarchy and Anarchists*, 131; Avrigh, *The Haymarket Tragedy*, 194; and Green, *Death in the Haymarket*, 178.
- ²³⁴ According to Avrigh, “Every utterance by the defendants that contained or seemed to contain a threat against established society was repeated before the court.” *The Haymarket Tragedy*, 275.
- ²³⁵ Black, Salomon, and Zeisler, *Brief and Argument*, 157.
- ²³⁶ Black, Salomon, and Zeisler, *Brief and Argument*, 163; and Avrigh, *The Haymarket Tragedy*, 276.
- ²³⁷ According to Floyd Dell, this tactic worked. “Socialism and Anarchism in Chicago,” 404.
- ²³⁸ Quoted in Gary, “The Chicago Anarchists of 1866,” 831.
- ²³⁹ Black, Salomon, and Zeisler, *Brief and Argument*, 164-173.
- ²⁴⁰ “A Hellish Deed (?)” *Chicago Tribune*, May 5, 1886.
- ²⁴¹ Lingg, “Address of Louis Lingg,” 30.
- ²⁴² Engel, “Address of George Engel,” 33-34.
- ²⁴³ Engel, “Address of George Engel,” 34.
- ²⁴⁴ Parsons, “Address of Albert R. Parsons,” 103.
- ²⁴⁵ Spies, “Address of August Spies,” 4.
- ²⁴⁶ Spies, “Address of August Spies,” 5. “I am an incendiary—let it be so!” he declared in his autobiography (6). Parsons, in an informal note written at the trial, stated a similar sentiment regarding the relationship between dynamite and the labor movement: “The enemies of liberty strive to create the belief that an Anarchist is a dynamiter. I deny it. I say that is a villainous slander—a malicious premeditated falsehood. I’ll tell you what an Anarchist is. Anarchists are people who know their rights and dare to maintain them. If this makes me an Anarchist then put me sown as such, and if this makes me a dynamiter then count me as one.” Quoted in Avrigh, *The Haymarket Tragedy*, 276.
- ²⁴⁷ Spies, “Address of August Spies,” 1-2. The other defendants’ addresses to the court also described the illegal proceedings of the trial. For detailed descriptions of the trial’s illegal proceedings, see Altgeld’s, “Reasons for Pardoning” in *The Chicago Martyrs*; and Black, Salomon, and Zeisler, *Brief and Argument*.
- ²⁴⁸ Faliero is also sometimes called Falier or Falieri, and Spies called him Faheri.
- ²⁴⁹ Spies, “Address of August Spies,” 1. Parsons used similar language, saying “the prosecution here accuses us, of that very thing which they themselves are guilty of.” “Address of Albert R. Parsons,” 111.
- ²⁵⁰ Spies, “Address of August Spies,” 9.
- ²⁵¹ Spies, “Address of August Spies,” 9.
- ²⁵² Spies, “Address of August Spies,” 5.
- ²⁵³ Spies, “Address of August Spies,” 14.
- ²⁵⁴ Spies, “Address of August Spies,” 5.
- ²⁵⁵ Spies, “Address of August Spies,” 8-9.
- ²⁵⁶ Spies, “Address of August Spies,” 7-8.
- ²⁵⁷ Spies, “Address of August Spies,” 3. Grinnell used almost identical language to laud the actions of Bonfield and the police: “If he had not [marched on Haymarket], the next night it would have had to be done, or the next, and whereas senev poor men are dead, there would have been instead hundreds, perhaps thousands...Hundreds and perhaps thousands were saved.” Quoted in Schaack, *Anarchy and Anarchists*, 401.
- ²⁵⁸ Gary, “The Chicago Anarchists of 1866,” 811-812. Also see, Schaack, *Anarchy and Anarchists*, 390-403; Kogan, *The Chicago Haymarket Riot*, 14-15; and Avrigh, *The Haymarket Tragedy*, 221. Judge Gary later wrote that it did not matter to the conspiracy charges against Spies whether the bomb “was thrown by one who was himself a member of the conspiracy, or who was some harebrained fool, or some criminal who wished to avenge himself for some grievance, real or fancied, that he had suffered at the hands of the police” (828).
- ²⁵⁹ Spies, “Address of August Spies,” 6.

²⁶⁰ See Booth, *A Rhetoric of Irony*, 177. The Haymarket bombing seemed imbued throughout with irony, according to Carl Smith, who noted the prevalence of unstable meanings, ironic meanings, and contested definitions of words during the Haymarket incident. He called these “ironic reversals.” *Urban Disorder*, 143-146.

²⁶¹ Spies, “Address of August Spies,” 15.

²⁶² Spies, “Address of August Spies,” 15.

²⁶³ Spies, “Address of August Spies,” 6 and 12. Spies equivocated socialism, communism, and anarchism as desirable alternatives to industrial capitalism.

²⁶⁴ Spies, “Address of August Spies,” 16.

²⁶⁵ Spies was not alone in his attempt to cultivate his status as a martyr, and many pro-labor writers wrote paeans to the eight defendants during the trial, during their imprisonment, in the aftermath of their execution, and in the ensuing decades. The long list of activists who called Spies and his colleagues martyrs to the labor movement and to the freedom of speech includes Samuel Gompers, Peter Kropotkin, Benjamin Tucker, Emma Goldman, “Mother” Mary Harris Jones, and Eugene V. Debs, while Howard Zinn would dedicate a chapter of his popular *People’s History of the United States* to Haymarket. See William Holmes’s, “Introduction,” to Altgeld, et al., *The Chicago Martyrs*, v; Avrich, *The Haymarket Tragedy*, and Nelson, *Beyond the Martyrs*.

²⁶⁶ Engel, “Address of George Engel,” 33; Fielden, “Samuel Fielden,” 59 and 62; Fischer, “Address of Adolf Fischer,” 26 and 27; Avrich, *The Haymarket Tragedy*, 361, 385, and 411; and Green, *Death in the Haymarket*, 248.

²⁶⁷ Spies, “Address of August Spies,” 2.

²⁶⁸ Lanham, *A Handlist of Rhetorical Terms*, 148.

²⁶⁹ Burke, *A Grammar of Motives*, 516.

²⁷⁰ Spies, “Address of August Spies,” 16.

²⁷¹ Browne, *Angelina Grimké*, 37.

²⁷² Altgeld, et al., *The Chicago Martyrs*, 130.

²⁷³ In *America’s Culture of Terrorism*, Clymer argued that “the mass media itself became a constituent part of Haymarket as the press instantly shaped the largely unwitnessed bombing into a huge public event via telegraphic technology” (41).

²⁷⁴ Clymer, *America’s Culture of Terrorism*, 24.

²⁷⁵ A rare exception, Johann Most conceded in *Revolutionäre Kriegswissenschaft* that the popular perception of dynamite’s explosive power was hyperbolic, but most bomb talking exaggerated it (10 and 21).

²⁷⁶ Quoted in Avrich, *The Haymarket Tragedy*, 166 and 169.

²⁷⁷ Quoted in Avrich, *The Haymarket Tragedy*, 141 and 169.

²⁷⁸ Clymer, *America’s Culture of Terrorism*, 60-68. According to Dell, “In a movement which stood for the poor and oppressed, the symbolism of dynamite, though not by any means necessarily the use of it, was bound to make a tremendous appeal. For here was a wonderful new substance which made one poor man the equal of an army: it seemed created as a sign to the oppressors of earth that their reign was not forever to endure. This symbolism of dynamite it was, and not any actual interest in the use of it, that made it so frequent a topic in Anarchist speeches and writings during a certain period. It was, that is to say, a sentimental interest in dynamite. When that interest had been exhausted by repetition, the matter was dropped.” “Socialism and Anarchism in Chicago,” 391. At a meeting called by the Chicago Internationalists a “tableau” demonstrates that dynamite had become an important visual icon as well. Avrich wrote that the tableau represented “revolution” by depicting “a woman, dressed as the Goddess of Liberty, [who] stood on a raised platform holding aloft a red flag, while a worker stood beneath, armed with a flaming sword and carrying a cartridge box inscribed ‘Dynamite.’” *The Haymarket Tragedy*, 138. Carl Smith wrote that “bomb talking” should be “understood as a kind of performance especially suited to anarchist politics and the romantic sensibility behind them, as an attempt at personal empowerment through rhetoric to which radicals resorted from a position of weakness, from what Dell called a ‘sentimental interest’ in the ‘Idea’ of dynamite as unstoppable weapon.” He further wrote, “Most of all, perhaps, talking about bombs made anarchists (and plenty of their enemies) believe that they were a force to contend with, and that their social vision was possible, practical, and real.” Smith *Urban Disorder*, 117-118. Popular press stereotyped images of anarchists as bearded, slovenly, drunken, and lurking with dynamite bombs, an image that, in part, the anarchist press helped to cultivate. See Avrich, *The Haymarket Tragedy*, 166-71, 406 and 428.

²⁷⁹ Green, *Death in the Haymarket*, 199-200. Also see Avrich, *The Haymarket Tragedy*, 177 and 222-224; and Smith, *Urban Disorder*, 124-125. Smith noted that the “popular imagination...had come to see social and political protest, class warfare, and cataclysmic violence, all set against the backdrop of industrial neighborhoods...as a single phenomenon.” *Urban Disorder*, 125. Regarding the use of dynamite by the Paris Commune, Nobel’s

biographer Erik Bergengren reported that “the rabble’s homemade bombs, had aroused throughout the country a somewhat exaggerated terror of any new explosives.” *Alfred Nobel*, 65.

²⁸⁰ McConnell, “The Chicago Bomb Case,” 730.

²⁸¹ Quoted in Avrich, *The Haymarket Tragedy*, 455.

²⁸² Quoted in Avrich, *The Haymarket Tragedy*, 454-455. Also see Avrich, *The Haymarket Tragedy*, 455-456; Green, *Death in the Haymarket*, 203; and Nelson, “Chicago’s Socialist and Anarchist Press,” 103.

²⁸³ Quoted in Gary, “The Chicago Anarchists of 1886,” 834.

²⁸⁴ Quoted in Avrich, *The Haymarket Tragedy*, 163-164. On the other side of the courtroom, according to third state’s prosecuting attorney George Ingham, “the very question itself is whether organized government shall perish from the earth; whether the day of civilization shall go down into the night of barbarism; whether the wheels of history shall be rolled back, and all that has been gained by thousands of years of progress be lost.” Quoted in Green, *Death in the Haymarket*, 224.

²⁸⁵ Quoted in Avrich, *The Haymarket Tragedy*, 455-456.

²⁸⁶ Green, *Death in the Haymarket*, 203.

²⁸⁷ “A Hellish Deed (?)” *Chicago Tribune*, May 5, 1886.

²⁸⁸ Nelson, “Chicago’s Socialist and Anarchist Press,” 103.

²⁸⁹ Decades after the Haymarket riot, Kropotkin lamented that the Haymarket bomb “created in the general public the impression that violence is the substance of anarchism.” “Anarchism,” 916.

²⁹⁰ The first two chapters of Clymer’s *America’s Culture of Terrorism* argued that contemporary terrorism rhetoric was latent in Haymarket bomb talking.

Chapter 4

Humane Extermination: The Mustard Gas Advocacy of Major General Amos A. Fries

“Notwithstanding the opposition of certain people who, through ignorance or for other reasons, have fought it, chemical warfare has come to stay.”²⁹¹ —A. A. Fries and C. J. West

British troops of the 15th and 55th Divisions did not pay much attention to the shells that landed in their frontline trenches with a plopping sound on the night of July 12-13, 1917. An unfamiliar faint odor suggested a gas attack, but the lack of a visible cloud, a pungent smell, and physical symptoms indicated that the German barrage at Ypres had, aside from harassing the men of the 6th Battalion, failed. The soldiers thought they were duds. Still, having accustomed themselves to chemical warfare, many of the troops affixed their gas masks and awaited the all clear that came the following morning. But they were not duds. The German Army had saturated the front between St. Jean and Potijze with about 50,000 mustard gas shells.²⁹² As the day progressed, the battalion’s 5,000 soldiers developed large suppurating blisters, and their eyesight failed.²⁹³ Many lay dead or dying. Over a million more German mustard gas shells followed in the next ten days, dousing the front with 2,500 tons of mustard gas and causing a staggering increase in British “gas” casualties.²⁹⁴

Victor Meyer invented the German method of mustard gas preparation in 1886 when he mixed thiodiglycol with phosphorous trichloride.²⁹⁵ When the German Chemical Warfare Service discovered its usefulness as a weapon, the burgeoning German chemical industry already had the means to produce it in large quantities. Two chemical companies, Bayer and C. A. F. Kahlbaum, manufactured the gas and filled shells at a peak rate of 24,000 per day and 200,000

per month.²⁹⁶ Once the German Army understood that adding high explosives [HE] to mustard gas shells would disseminate the liquid in a fine mist that increased the likelihood of inhalation and skin contact, even more dangerous second generation shells were manufactured.²⁹⁷ These shells eliminated the tell-tale “plop” made by the original mustard gas shells and made their explosive sound indistinguishable from other HE shells. This increase in destructive capacity, along with mustard gas’s relative permanence, especially in cold weather, and its debilitating physiological propensity to seep into any wet human cell in lungs, eyes, and skin helped to build the reputation of mustard Gas as WWI’s most notorious chemical weapon. Owing to its physically and psychologically destructive power, mustard gas became a potent symbol of early 20th century wartime destruction.

More so than any other weapon deployed in WWI, “gas” received the most opprobrium, and its use stirred great controversy and debate owing to its novelty and the magnitude of fear it generated. According to Paul Virilio, all wars possess certain weapons that help to define perception of a conflict.

There is no war . . . without representation, no sophisticated weaponry without psychological mystification. Weapons are tools not just of destruction but also of perception—that is to say, stimulants that make themselves felt through chemical, neurological processes in the sense organs and the central nervous system, affecting human reactions and even the perceptual identification and differentiation of objects.²⁹⁸

Virilio’s claim well applies to mustard gas on the chemical and psychological levels. During WWI, the world looked different through a fogged-up gas mask. Since the range of artillery covered the entirety of the European front and could extend everywhere, the mustard gas threat seemed to loom more and more for the entire global population. Rolling clouds of vaporized liquid, human research experiments, and industrial accidents threatened citizens far from WWI’s frontlines, helping mustard gas earn its notoriety as the “king of gases.”²⁹⁹ Despite the anxiety

produced by mustard gas, its destructive power never quite caught up with the hyperbolic rhetoric used to describe it. Like other chemical weapons, the effectiveness of mustard gas decreased throughout the war with training and the innovation of defensive equipment.

Thus, in order to remain a viable military option in the face of widespread opposition and limited battlefield use, mustard gas needed persistent advocates. Amos A. Fries became such an advocate – a “super-military agitator” for chemical warfare.³⁰⁰ A Lieutenant Colonel in the Army Corps of Engineers, he had worked on projects as diverse as improving Los Angeles Harbor and building roads at Yellowstone Park. In mid-August 1917, he arrived in France as the Director of Roads for the American Expeditionary Force [A. E. F.]. Five days later, though, in the chaos of adjusting to unfamiliar ways of waging a chemical war, he became Chief of the brand new Gas Service.³⁰¹ Fries directed the somewhat stilted American response to Germany’s use of chemical weapons, building the Gas Service out of nothing. After President Woodrow Wilson’s “General Order no. 62” in late June, 1918 amalgamated various other service branches into a distinct bureau in the War Department called the Chemical Warfare Service [CWS], Fries became a U.S. Army Brigadier General and Chief of the Chemical Warfare Service, A. E. F.³⁰² Upon WWI’s conclusion, Fries began building the CWS into a primary unit of the U. S. Army, and in early 1920 he became Chief of the Chemical Warfare Service. He maintained this position until his military retirement in 1929, whereupon he became a virulent anti-communist and “right wing” education pundit.³⁰³ Fries, as an outspoken advocate of chemical warfare, bore a central responsibility for assuring both the presence of mustard gas in American arsenals and the spillover use of chemical agents in everyday industrial consumer products.³⁰⁴ In 1921 he published his definitive statement on the topic, *Chemical Warfare*, co-written with Clarence J. West.

Unlike Fries, chemical warfare did not dominate West's professional career. Before the war, he received his doctorate in chemistry from the University of Michigan in 1912 with a thesis on salt. When the U.S. began preparing for chemical warfare, the Army, the U.S. Bureau of Mines, and the National Research Council (NRC) organized about 15,000 American chemists to serve in either civilian or military capacities at home and overseas. West was enlisted, and during the war he served as the head of the editorial department of the Research Division of the CWS. From 1918 to 1919 he worked on researching and testing gas masks at the American University wing of the CWS. The CWS maintained close ties with the NRC after the war, and the organizations worked on a number of joint projects, such as investigating how to combat marine borers. West became Director of the NRC's Research Information Service in 1921. By and large, the publication of *Chemical Warfare* marked West's last direct involvement with the subject of chemical warfare, although as the Director of Research Information Service at the NRC, which served as an intermediary between university and government chemical warfare research, he helped to keep track of American chemists and other scientists should future wars need their enlistment.³⁰⁵

Fries and West needed to turn conscripts and officers into well-drilled battlefield chemists. In addition to advocacy, therefore, another of *Chemical Warfare's* purposes was pedagogical, and much of it reads like a Chemistry textbook. *Chemical Warfare* covers the full range of lachrymators, sternutators, nerve agents, and vesicants developed during the war, and how to utilize, research, and produce them. It includes a detailed guide to the chemical and technical manufacturing of mustard gas, complete with diagrams of requisite apparatuses and chemical formulas. It also includes a history of chemical warfare, its development in WWI, and the formation of the Chemical Warfare Service, in addition to offensive and defensive tactics.³⁰⁶

WWI correspondent Carl W. Ackerman called it “the first authoritative book on the subject of poison gas published in the United States.”³⁰⁷

For Fries and West, a lack of knowledge and training in chemical warfare would be fatal to the U.S. Army. They wrote, “From the standpoint of the man at the front the Training Division [of the CWS] is one of the most important [army divisions]. To him gas warfare is an ever present titanic struggle between poisonous vapors that kill on one side, and the gas mask and a knowledge of how and when to wear it on the other.”³⁰⁸ Chemistry was thus vital to military training.³⁰⁹ The “titanic struggle” presented people with an unappealing proposition: learn how to identify chemical agents and don the proper protective gear at a moment’s notice, or die. Yet, even as *Chemical Warfare* depicted chemical weapons as having such extraordinary and singular military significance, it worked to make training in chemical warfare seem banal, in step with the routines of everyday military life.

In this chapter I argue that Fries and West humanized chemical warfare not to celebrate it, but to manage the paradox that a weapon of mass destruction could be useful for manufacturing “peace.” Several of *Chemical Warfare*’s rhetorical purposes – weapons advocacy, training soldiers in chemical warfare, analyzing the tactics and strategies of chemical warfare, and making futuristic projections – helped them “humanize chemical” warfare, itself a paradox, by making it seem like a routine and unremarkable element of warfare, if not everyday life. Unlike Spies, who exploited the instabilities of language and logic afforded by paradox, Fries and West did not navigate the paradoxes of technology so much as they confronted a rhetorical product of the Malthusian Paradox: an either/or dilemma about whether or not chemical warfare was humane. In confronting the strong categorical binaries that characterized chemical warfare discourse, Fries and West jettisoned ambivalence and logical uncertainty to take a firm stance in

favor of chemical weapons as a preservative force. In this way, by attempting to legitimate chemical weapons as distinctly humane in their capacity to preserve life, Fries and West extended and added to the basic rhetorical tactics used by Malthus and Spies to negotiate the Malthusian Paradox.

The remainder of this chapter examines the chemical weapons paradox in three parts. The following section provides a historical and discursive overview of how the Paradox of chemical weapons developed into a strict, but rhetorically unstable, polarization between pro-gas proponents and anti-gas opponents. Proponents declared chemical weapons preservative, and therefore humane, and opponents declared them too destructive, and therefore inhumane. This binary constituted the rhetorical terrain that Fries encountered as he mounted public relations campaign to establish the legitimacy of chemical weapons. Next I show how Fries and West negotiated this paradoxical binary in *Chemical Warfare*. By advancing statistical proofs of chemical warfare's humaneness and amplifying their humane preservative efficiency to encompass the complete spatio-temporality of humankind, they attempted to rhetorically stabilize the somewhat chaotic discourse of chemical weapons. In conclusion, I assess the results of Fries's publicity campaign and trace the post-WWI history of mustard gas and chemical weapons.

The Paradoxical Discourse of Chemical Warfare

Much like Haymarket era bomb talking, WWI era chemical weapons discourse was characterized by rhetorical instability, as chemical weapons in general, and mustard gas in particular, became polarizing issues. Yet, unlike Haymarket era bomb talkers – from anarchists to capitalists, and from journalists to factory workers – who all agreed that dynamite was a useful

and legitimate weapon, the participants in WWI era chemical warfare discourse became starkly divided over the legitimacy of chemical weapons. Proponents displayed unwavering devotion to chemical weapons and detractors displayed unwavering vitriolic condemnation. Both sides remained adamant. In this section, I suggest that this sharp division between chemical warfare's advocates and its detractors defined how rhetors articulated the Malthusian Paradox of weaponized gases. In the remainder of this section, I indicate the rhetorical instability of this discourse by examining their main points of contention, which was best exemplified by disagreement about whether chemical warfare was "humane." Confronted by widespread condemnation of chemical weapons and an instable rhetorical terrain, Fries took a firm stance in favor of chemical warfare, a stance that included a profuse public relations campaign.

In the decades before WWI, chemical warfare was an ardently contested issue in international peace negotiations and armaments conventions. The problem of chemical warfare, as it was construed in diplomatic debates, revolved around whether weapons that killed by poisonous vapors – rather than by steel or explosives – were legal. The 1899 and 1907 Hague Peace Conventions made the issue prominent. Diplomats and state leaders at both conventions deliberated the legitimacy of "poison or poisoned weapons," and in the end, both treaties outlawed them. The 1899 treaty decreed that the "contracting Powers agree to abstain from the use of projectiles the sole object of which is the diffusion of asphyxiating or deleterious gases."³¹⁰ Germany signed, but the U.S. did not. "Article 23" of the 1907 treaty, which all of WWI's major belligerents signed, was explicit about the reason to ban chemical weapons: they had been "justly condemned by the general opinion of the civilized world."³¹¹ By taking a definitive stance against chemical warfare as illegal and barbarous, the two Hague treaties established the illegitimacy of chemical warfare as an explicit, but refutable, point of

international law. At that point, though, the debate was speculative; no military yet possessed any viable chemical weapons.

Perhaps more so than the outright banning of poisonous gases in international law, it was how diplomats questioned the humaneness of the new weapons that indicated how the chemical warfare debate would become so polarized. Famed naval strategist and American diplomat A. T. Mahan provided the era's definitive statement on the humaneness of chemical weapons. He persuaded the 1899 American delegation to abstain from signing the Hague treaty, because, he argued, asphyxiating gases were as humane as any other weapon.

The reproach of cruelty and perfidy addressed against these supposed [poison gas] shells was equally uttered previously against fire-arms and torpedoes, although both are now employed without scruple. It is illogical and demonstrably humane to be tender about asphyxiating men with gas, when all are prepared to admit that it is allowable to blow the bottom out of an ironclad at midnight, throwing four or five hundred men into the sea to be choked by the water, with scarcely the remotest chance to escape.³¹²

This uncompromising proclamation equated poisonous gas's destructive capacity with that of "conventional" weapons. Its function, like any other means to victory, was to wreak maximum destruction. Mahan in 1899 thus neither professed chemical warfare humane nor inhumane. Rather, Mahan's statement implied that the objections to chemical warfare made by the Hague treaties and their advocates were inconsistent, even paradoxical, unless they deigned to oppose warfare writ large. Nevertheless, he did give prominence to the question of humaneness, and this question became the defining stasis point of the ensuing chemical weapons controversy.

The rampant use of chemical weapons in WWI, however, moved the debate from diplomatic circles into full public view. The massive scale of Germany's mustard gas deployment, exemplified by the dousing of British troops at Ypres III, in addition to the fear it produced, its persistency, its toxicity, and its physiological effects made the *humaneness* of mustard gas – and chemical warfare in general – the most contested issue.³¹³ In fact, it seemed to

constitute the only stasis point that opponents agreed to contest directly. Drawing from his experiences as a doctor and member of the British gas troops during the war, pro-gas advocate J. B. S. Haldane laid out the debate's basic positions. "I claim, then, that the use of mustard gas in war on the largest possible scale would render it less expensive of life and property, shorter, and more dependent on brains rather than numbers. We are often told the exact opposite, that it will make it more barbarous and indecisive, and lead to the wiping out of the population of whole cities."³¹⁴ In this way, almost every rhetor who addressed the topic of chemical warfare weighed in to declare it either humane or inhumane.³¹⁵

Chemical weapons discourse proceeded to develop in paradoxical fashion. Advocates held that chemical weapons preserved life by significantly reducing bloodshed, lifelong debilitating injuries, and death, as well as by deterring wars from being fought. Opponents held that chemical weapons were exceptionally destructive and typified the most horrific form of warfare. Thus, chemical weapons discourse reiterated the paradox that what kills us will save us and what saves us will kill us. And it was in this way that this iteration of the Paradox differed from those of Malthusian population theory and dynamite bombs. While the discourse as a whole was paradoxical, very few individual rhetors ever spoke of it as so. Rather, rhetors took sides—pro or con—and articulated the problem in the starkest of terms. The two opposed positions subsequently avoided direct confrontation with each others' major arguments, and thereby stabilized their own terrain of the discourse, even as chemical warfare discourse as a whole remained as rhetorically messy and instable as the weapons under consideration.

Far from merely proclaiming gas "humane" – if not the "most humane weapon ever invented" – advocates speculated that chemical weapons were so powerful that they would abolish war.³¹⁶ Advocates argued that not only did chemical weapons win wars by reducing

bloodshed, injuring without killing, and reducing the length of wars, they also would preserve life by constituting a deterrent so powerful that it could never exist. Fries articulated this commonplace in his 1920 Annual Report of the CWS: “As warfare becomes more complicated, intelligence and science become of greater value, and every development of science that makes warfare more universal and more scientific makes for permanent peace through making war intolerable.”³¹⁷ The latter half of this sentence became the slogan of the CWS’s *Chemical Warfare* bulletin.³¹⁸ Fries and other chemical warfare advocates wanted peace, but only a peace maintained by weaponized gas. This logic, however, would necessitate an unceasing chain of weapons escalation. Competing powers would work to make the chemical weapons deterrent viable with the most destructive weapon possible, which would empower ever more destructive offensive power. Reducing the length of wars, or abolishing them, would thus require future weapons with much more maiming and killing capacity. To chemical warfare’s detractors, of course, such talk was “monstrous and inhumane.”³¹⁹

The prospect of escalating the power of chemical weapons with airplanes provides a stark example of this rhetorical split in meaning and helps to indicate the rhetorical instability of the era’s chemical weapons discourse. Advocates and detractors described the development in terms almost identical terms to each other, but paradoxically, to argue opposite positions. In a 1921 article for *National Service* magazine, Fries wrote, “Perhaps the greatest guarantee that war will cease is the development of chemical warfare and the spreading of information that chemical warfare along with the Air Service will make war more and more universal, finally carrying it to the door of every citizen. When that day comes the world will see strenuous efforts made to settle disputes without resorting to war.”³²⁰ In comparison, journalist Will Irwin’s *The Next War*, which also saw print in 1921, foresaw “a projectile—the bomb carrying aeroplane—of

unprecedented size and almost unlimited range; here is a killing instrument—gas—of power beyond the dream of a madman; here is a scheme of warfare which inevitably draws those who were hitherto regarded as non-combatants into the category of fair game.”³²¹ Aside from a reference to a “madman” and a more assertive stance on gas’s destructiveness, Irwin’s anti-gas appeal mirrored Fries’s pro-gas appeal. Thus, for Fries, the threat of sprinkling mustard gas from airplanes would cause an end to war, but to Irwin the same act promised global terror.

For gas’s opponents, talk of fewer casualties and fatalities and speculation about permanent peace failed to address the realities of chemical warfare. Unlike the war’s other common chemical agents, mustard gas “burns the body inside or out, wherever there is moisture. Eyes, lungs and soft parts of the body are readily attacked.”³²² Once absorbed into cells through various pores, mustard gas converts into hydrochloric acid through hydrolysis. The mustard-gassed body thus becomes a miniature acid factory and storage container for the toxic substance to burn for, perhaps, weeks until hydrolysis renders the gas inert.³²³ Mustard gas therefore caused particular injuries that conventional weapons did not – burning from the inside out, as well as from the outside in, prolonged asphyxiation from drowning on one’s own fluids, and the development of putrid sores over the entire body. British soldier-poet, Wilfred Owen, described the experience of being gassed as “an ecstasy of fumbling...floundering like a man in fire or lime...guttering, choking, drowning...white eyes writhing...blood gargling from the froth-corrupted lungs...vile, incurable sores on innocent tongues.”³²⁴

At first, avoiding injury during a mustard gas would have been near impossible when German mustard gas soaked the salient.³²⁵ As the German Army proceeded to launch as much mustard gas as it could, shelling the British trenches with it every night, the already muddy battlefield became a “sucking quagmire...foul with every abomination.”³²⁶ In March 1918,

witnesses reported that mustard gas flowed through the streets of Armentières like water.³²⁷ After the air cleared, mustard gas still saturated the muck, threatening soldiers with incapacitating skin blisters should they slip into a crater. Not appreciating mustard gas's persistency, casualties and fatalities mounted as soldiers handled tainted equipment, ate tainted food, touched each other, brushed the ground while defecating, and fell in the mud.³²⁸ Nurses and doctors who treated the wounded became casualties.³²⁹ Even after the infantry understood the characteristics of mustard gas, diving into craters to evade high explosive [HE] and shrapnel shells necessitated diving into mustard gas-soaked mud against which their uniforms could not protect. To soldiers, this was "dirty warfare."³³⁰

Gas's opponents further argued that it produced particular types of horrifying psychological damage. Chemical weapons triggered apprehension, panic, battle fatigue, and "gas mask exhaustion" like no other weapons.³³¹ Gas attacks demoralized both green recruits and veterans.³³² Frightened troops "stampeded" from the front.³³³ Psychological horror, or "gas shock," accompanied the "frightful pandemonium" when a lookout cried "Gas!"³³⁴ Recounting an early mustard gas attack in his war diary, Hervey Allen noted that a new member of the British gas school "couldn't apprehend the fact that we [infantry] were suffering from the fear of gas, rather than from the gas itself."³³⁵ Soldiers suffering from "gas fright" thought they had been gassed when no attack had occurred.³³⁶ Additional neologisms like "gas neurosis" and "shell shock" were born from the atypical physical destruction of WWI artillery bombardments.³³⁷

For the most part, American public opinion sided with chemical warfare's opponents. Americans expressed a staggering dislike of gas and expressed an "outspoken and almost violent" hostility to chemical warfare.³³⁸ An opinion poll about disarmament conducted in late 1921 tallied 366,795 votes for abolition of gas warfare and 19 votes in favor of its retention.³³⁹

Fries and the CWS asserted that “disinformation” about poison gas, such as Wilfred Owen’s poem, had poisoned the public’s knowledge of chemical warfare with inaccurate depictions.³⁴⁰ No matter the source of negative public opinion, the public’s stance was clear, and official U.S. WWII military historians claimed that “there can be no doubt that gas warfare emerged from World War I with the reputation of a horror weapon even when field experience did not substantiate this view.”³⁴¹

Military command did not share infantry’s dread of the new weapons, but it did approach chemical warfare with trepidation. Fries and West wrote that during the war, “Much the hardest, most trying and most skillful work required of the Chemical Warfare Service officers was to persuade...Staffs and Commanders that gas was useful and get them to permit a demonstration on their front.”³⁴² This reluctance remained after the war. So, in addition to facing civilians and soldiers sick of war and horrified by “poison gas,” Fries and the CWS also were mostly unprotected in a time of great demobilization, army reorganization, funding cuts, and disarmament conventions.³⁴³ To survive so much turmoil, according to a “watchword” of the CWS, “Chemical Warfare Service officers have got to go out and sell gas to the Army.”³⁴⁴

Fries, however, did more than attempt to “sell gas to the Army.” The rhetorical terrain of his enterprise, marked by widespread reluctance, opposition, and hostility to chemical warfare, helped to define the scale of his response. Fries mounted a profuse public relations campaign to tout the necessity of maintaining chemical warfare to military command, soldiers, politicians, chemists, and the American public. He wrote articles for military publications, chemistry journals, and popular magazines, wrote letters to chemists in an attempt to enlist them to influence politicians (he provided direct-mail postcards), gave speeches at military events, testified before congress, and even wrote a negative book review of an anti-gas treatise. The

direct-mail resolution he asked chemists to send their congressmen read: “Therefore, let it be Resolved That it is the opinion of (—) that chemical warfare is such a complete and distinct science in itself, as well as such a powerful weapon of war, that a strong Chemical Warfare Service should be maintained as a complete and independent department in the United States Army, as a prerequisite to any proper national defense of our country.”³⁴⁵ The stakes of Fries’s public relations campaign were high: he was defending a novel, but required, military unit, a nascent, but vast, chemical industry, and attempting to ensure general military preparedness with speculative warfare looming. *Chemical Warfare* was thus the primary document of a much larger publicity campaign in which advocating chemical warfare, keeping soldiers trained, analyzing tactics and strategies, and predicting the future of chemicals and chemical warfare were essential rhetorical components.

Fries and West argued that their persuasive goal was educational – to educate soldiers and citizens about chemical warfare in order to disabuse them of their ignorance and cowardice, which merged with a secondary goal to ensure the survival of American soldiers.³⁴⁶ Regarding the first goal they wrote, “*We believe that all opposition to chemical warfare to-day can be divided into two classes—those who do not understand it and those who are afraid of it—ignorance and cowardice.*”³⁴⁷ But facts would dispel both, they claimed, and once enough information made its way to the public, public opinion would turn in favor of the CWS. With respect to their second pedagogical goal to protect soldiers, Fries and West described their basic onus in terms that would also help disabuse recruits of fear and ignorance. They wrote, “While the importance of impressing upon the soldier the danger of gas was early appreciated it was deemed necessary not to make him unduly afraid of the gas.”³⁴⁸ With so much anti-gas opinion based on hyperbolic fear and ignorance, they asserted that the public needed a way to “check the

accuracy” of the chemical warfare information they encountered.³⁴⁹ Thus, accuracy, they claimed, would educate and calm.

In *Chemical Warfare*, Fries’s and West’s pedagogical goals, advocacy goals, and strategic goals resulted in a rather complex task as they confronted their central rhetorical dilemma – the stark paradoxical binary constituted by the disagreement between chemical warfare’s opponents and proponents. However, Fries and West did not negotiate the paradoxes of technology directly, or even semi-directly, in the ways Malthus and Spies did. Rather, they negotiated one pole of the chemical weapons paradox – the pole that categorically declared chemical weapons humane, legitimate, and above all, preservative. They denied outright their adversaries stance that the weapons were inhumane, illegitimate, and above all, destructive. Fries and West declared, for instance, that “the Army and the general public have now so completely indorsed chemical warfare that it is believed the argument of the inhumanity has no weight whatever,” and that “inhumanity of [gas] is absolutely disproven by the results of its use in the World War.”³⁵⁰ They asserted the undeniable validity of chemical warfare: “Notwithstanding the opposition of certain people who, through ignorance or for other reasons, have fought it, chemical warfare has come to stay.”³⁵¹ With their partisan position clarified, they negotiated the Malthusian Paradox by attempting to stabilize the unruliness of chemical weapons discourse. They did so by depicting chemical weapons as fearful enough to never falter in defense, but not so fearful as to refuse its penetration into all spheres of human activity. With statistical proofs, Fries and West thus depicted the horrific characteristics of chemical warfare as easily endured; and through rhetorical amplification, they transformed its lackluster battlefield record into a monumental achievement.

Stabilizing Chemical Warfare Discourse: Statistical Diminishment and Totalizing Amplification

Chemical warfare emerged from WWI in technological and rhetorical disarray. As such, chemical warfare was invoked for a broad range of political purposes, from arguing for pacifism to preparing for more war. Mustard gas symbolized the horror of war as much as it symbolized the promise of future weapons to abolish war. Fries and West, seeking to dispel the image of chemical weapons as horrifying, despicable, illegal, destructive, treacherous, and inhumane, attempted to stabilize the rhetorical significance of weaponized gases by touting their effectiveness and viability as the primary weapons of choice. Hence, they confronted the Paradox as a distinctly polarized product of chemical warfare discourse, but adopted a decidedly one-sided perspective. Categorically rejecting the claim of “inhumanity,” Fries and West made the case for the power of mustard gas to secure victory while preserving life.

Fries and West used two primary rhetorical tactics in *Chemical Warfare* to stabilize the discourse of chemical weapons. They advanced statistics and amplified speculations. With respect to the former Fries and West published casualty and fatality statistics to prove the humane power of chemical weapons to preserve life rather than kill it. These statistics downplayed chemical warfare injuries in comparison to those of conventional weapons. With respect to the latter, as they looked forward to the future of chemical warfare, the authors used amplification to depict how the gas could penetrate the entire spatio-temporality of human existence. At the highest level of their amplification, they made totalizing arguments that made mustard gas appear capable of permanently extending its humane preservative power across the entire globe. With these two tactics, Fries and West thus attempted to stabilize the chemical warfare controversy, and decide it, unambiguously, in the CWS’s favor.

Statistical Diminishment

In scattershot fashion throughout *Chemical Warfare*, Fries and West invoked statistics to demonstrate the humaneness of mustard gas and other chemical weapons. Whether they were describing a particular war gas, specific battles, chemical warfare tactics and strategy, or advocating for the weapons, they used statistics to downplay chemical warfare's destructive power.³⁵² They argued that ignorance, not genuine controversy, was responsible for the debate about chemical warfare, and used statistical comparison to attempt to dispel such "ignorance."³⁵³ According to Fries and West, "The measure of humanity for any form of warfare is the percentage of deaths to the total number of injured by the particular method of warfare under consideration."³⁵⁴ According to the accumulated battlefield data from WWI they presented, chemical weapons produced a very low percentage of deaths and only minor injuries. By this logic, the cumulative data showed that the effectiveness of chemical weapons derived not from their capacity to kill or maim, but counter-intuitively, from their capacity to preserve the lives of combatants. The ideal image, invoked by Fries and West, of well trained and defense-minded soldiers who escaped injury and death thus seemed to stabilize the rhetorical chaos of chemical warfare discourse by depicting not the horror of battle, but the banality of routine.

Minimizing the destructive power of mustard gas served Fries's and West's rhetorical goal to teach wary soldiers that the weapon's killing power was easily surmounted with basic defensive measures. They wrote, "Due to the very slight concentrations ordinarily encountered in the field, resulting from a very slow rate of evaporation, the death rate is very low, probably under 1 percent among the Americans gassed with mustard during the war."³⁵⁵ With this one percent fatality rate the authors conveyed that, of all the ways to die in battle, soldiers would

probably not die from mustard gas, even after exposure. The low fatality rate showed that mustard gas was less of a frightful terror weapon, and more of a nuisance to endure within the more dangerous hail of steel. Fries and West did not deny that when troops were unprepared for an attack and ignorant of defensive measures, mustard gas lethality increased, as witnessed by the 6th Battalion on the night of July 12. This lethality, though, was limited. In the greater context of their pedagogy, the statistic inculcated the understanding that defensive gas equipment and procedures worked quite well. By knowing the simple defensive tactics that Fries and West taught - disposing of exposed clothing, rinsing chemicals from exposed skin as fast as possible, and avoiding gassed areas – soldiers could preserve their lives in a chemical attack. The dead were poorly trained, and therefore statistically insignificant.

Not only was mustard gas's fatality rate low, they argued, but its propensity to cause severe injuries was likewise minimal. The severity of most mustard gas casualties appeared slight in their estimation, because the typical exposure to it was very low. They wrote that, "one part in 14,000,000 is capable of causing conjunctivitis of the eye and that one part in 3,000,000 and possibly one part in 5,000,000 will cause a skin burn in a sensitive person on prolonged exposure."³⁵⁶ Hence, many gas casualties happened after brief contact with a miniscule amount of the substance – just enough to cause reactions. Fries and West further speculated that, "Probably the majority of burns from mustard gas arose from concentrations of gas consisting of less than one part of gas to five hundred thousand of air."³⁵⁷ Although horrific for victims, low-dose casualties, such as those caused by exposure to gassed woods, dugouts, shelters, and clothing, as well as skin-to-skin contact, caused blisters, minor lung damage, and temporary vision loss.³⁵⁸ These injuries caused by low-level exposure did not appear very hazardous, much less menacing. By Fries's and West's argument, the sheer statistical preponderance of non-severe

casualties refuted definitively the claim that it was an indiscriminate terror weapon. Mustard gas casualty and fatality statistics were, by their argument, definitive proof that it was humane. They helped secure victory by temporarily incapacitating, not permanently maiming.

Advancing the statistical mean of WWI fatality and casualty rates provided a further way to downplay the destructiveness of chemical weapons by empowering Fries and West to eliminate the significance of instances of mass casualties as statistical anomalies. They conceded that American casualties from German gas attacks “fluctuated through rather wide limits. There were times in the early days during training when this reached 65 per cent of the total casualties.”³⁵⁹ However, the final tally helped to stabilize the concept of chemical warfare by jettisoning the most chaotic and unstable moments of WWI, especially the battles where troops were unprepared for gas attacks (e.g., the first mustard gas attack). Such battles, they argued, provided little insight into the stable character of chemical warfare. Rather, as Fries and West sought to build trust in their system to reduce American casualties, the statistical mean proved the long-term effectiveness of the defensive gas tactics outlined in their textbook. “On the whole the casualties from gas reached 27.3 percent for all fatalities,” they concluded.³⁶⁰ Thus, instead of the statistical anomalies caused by the introduction of hitherto unexpected types of gas attacks, the important number was the whole number, the constant unwavering statistical mean that proved that mustard gas would injure but not kill if the readers of *Chemical Warfare* heeded its exhortations to exercise calm diligence in gas attacks.

Contrasting the casualty and fatality rates of chemical weapons with the rates of other WWI weapons provided Fries and West with a way to diminish the destructive power of chemical weapons by establishing their efficiency to injure but not to kill. More than just repeating a commonplace of chemical weapons discourse, they implied that military

commanders should embrace chemical warfare as a brand new strategic method. An “official list of casualties in battle as compiled by the Surgeon General’s office” cited by Fries and West showed that chemical agents caused 27.4 percent of 258,338 total U.S. casualties. Fries and West concluded from these numbers that “it is readily deduced that only 2 per cent of those wounded by gas resulted in death. That is, a man wounded on the battle field with gas had twelve times as many chances of recovery as the man who was wounded with bullets and high explosives.”³⁶¹ By defining chemical weapons as very injurious but not fatal, they situated war gases as simultaneously one of the least destructive weapons deployed in WWI and one of the most effective, since “no other element of war, unless you call powder a basic element, accounted for so many casualties among the American troops.”³⁶² Unlike conventional weapons, they injured many but killed few. Chemical weapons thus provided the *advantage* of wreaking a much lower amount of physical devastation than conventional weapons. Fries’s and West’s argument envisioned that strategists should want to disperse enemy troops with harassment, light casualties, and little to no bloodshed.

Indeed, this statistical argument seemed to overturn a basic principle of military strategy that dictated armies must seek maximum destruction in war. Clausewitz, for instance, asserted that the argument that one country could disarm another “without too much bloodshed” was a “fallacy that must be exposed,” that “moderation” in war led to “logical absurdity,” and that “the impulse to destroy the enemy...is central to the very idea of war.”³⁶³ Fries and West broke the connection between strategic success and destruction by implying that battlefield effectiveness derived not from killing and maiming, but from causing the greatest number of minor injuries. Considering their goal to “sell gas” to a military command schooled in the art of causing massive destruction, the claim that chemical weapons were more useful because they killed less and

inflicted less severe injuries than conventional weapons would have perhaps seemed a total reversal of war theory. They were proposing to win wars by preserving as many enemy soldiers as possible. In this way, Fries's and West's statistical comparison of like phenomena purveyed chemical weapons and the Chemical Warfare Service as the humane way to wage all future battles in defiance of the 19th century quest for maximum annihilation.

Fries's and West's statistical argumentation may have indicated to soldiers and the public that the danger posed by mustard gas should not cause undue fright or dereliction of training. But after spending so much space diminishing mustard gas's destructive power, Fries and West risked making the weapon no longer seem powerful enough to warrant manufacturing, storing, and deploying it to professionals whose livelihoods depended on the capacity to wreak wartime destruction and devastate enemy populations. If high explosive bombs and shells, machine guns, tanks, and airplanes were more destructive, then they would have seemed more desirable for further research and development, especially given the novelty of Fries's and West's chemical warfare strategy. Because they diminished mustard gas's effectiveness with statistics, they needed to rebuild its reputation as "king of the gasses." Thus, Fries and West bolstered their statistical proofs by touting chemical weapons as possessing an unequalled capacity to be deployed across the entire globe.

Totalizing Spatio-Temporal Amplification

Amplifying the destructive power of chemical weapons provided Fries and West with a means to stabilize chemical warfare discourse by clarifying that, even though chemical weapons were somewhat nondestructive and preserved enemy soldiers, that tendency did not mean

chemical weapons lacked the power to attain victory. Far from it, Fries and West argued. They used different levels of amplified magnitude to describe how chemical agents, and especially mustard gas, would prove militarily useful everywhere and for all time. They concentrated their use of amplification on depictions of what future gas warfare would be like, respective to the minimal, yet effective deployment of chemical weapons in WWI. I suggest that Fries and West used three levels of amplification, each extending the threat of chemical weapons and mustard gas to encompass more and more geographical and psychological space, and which climaxed in a totalizing generalization about the future of chemical warfare. The first level amplified mustard gas's efficiency on the battlefield, the second level augmented the first level by extending the weapon's range to the whole earth, and the third level swept every human peacetime activity into the purview of preservative toxic chemicals.

The first level of amplification built upon the reputation of mustard gas as the “king of gases,” and amplified its destructive power to encompass all elements of battle. Fries and West wrote that the introduction of “the most valuable war gas known at the present time” was so momentous that mustard gas “changed completely the whole aspect of gas warfare and to a considerable extent the whole aspect of warfare of every kind.”³⁶⁴ Mustard gas changed “the whole” of warfare by requiring a complete battlefield spatio-temporal adjustment to the new weapon. Its presence necessitated constant wariness wherever mustard gas shells might explode, which was everywhere on the front. It would persist for months, whereas an artillery shell's effectiveness did not persist beyond the first blast. Fries and West added a second temporal dimension to their amplification when they guaranteed that “in the future large numbers of these shell [HE and mustard gas] will be used.”³⁶⁵ Not only would mustard gas's toxicity persist, but so would its strategic usefulness. Mustard gas, according to this logic, will seep into the complete

spatio-temporal phenomenon of war, because all offensive actions would benefit from forcing enemies to don gas masks for interminable periods, wear almost unmovable impermeable clothing, and treat the entire landscape with neutralizers without end.

Fries and West further amplified the power of mustard gas by speculating about how chemical warfare would encompass not only all war activities, but the entire earth and all people. They wrote, “The high explosive mustard gas shell, not only because of its persistency but because of its quick deadliness, can be fired singly and be depended upon to do its work wherever there be men or animals.”³⁶⁶ Amplifying mustard gas’s potential to get deployed “wherever there be men or animals” extrapolated the dangers faced by soldiers in a battlefield gas attack to menace everybody. Civilians would need to learn chemical warfare defense as much as soldiers would. Fries and West thus implied that future chemical warfare would be unhampered by most problems of mobilization and logistics. They were certain that chemical weapons could extend to any living being in the battle zone. And the battle zone could be anywhere, but especially where people had less preparation and warning, which was away from battlefields.³⁶⁷ By this logic, mustard gas thereby began seeming like a more and more viable, useful, and successful weapon, one that the U.S. Army should maintain in its arsenals. If chemical warfare preparedness would dictate military behavior, then in the future imagined by Fries and West the global population must either wear a gas mask or face sure injury, albeit it probably not a terrible one.

The third level of spatio-temporal amplification made not just war but every facet of human existence appear dependent upon one type of weapon. According to Fries and West, “gas is a universal weapon, applicable to every arm and every sort of action. Since we can choose gases that are either liquid or solid, that are irritating only or highly poisonous, that are visible or

invisible, that persist for days or that pass with the wind, we have a weapon applicable to every act of war and for that matter, to every act of peace.”³⁶⁸ By proposing that chemical warfare would affect the global population’s “every” activity both in war and in peace, the magnitude of their amplification reached its uppermost totalizing limit. When they averred that peace and war will remain forever inseparable, Fries and West made chemical weapons seem unavoidable, necessary, and desirable. This speculative ideal applied to mustard gas as well, although not in practice.³⁶⁹ The “universality” of chemical weapons in peacetime broadened their appeal well beyond military affairs. The future of warfare, according to this highest level of amplification – the “universal” application of chemical weapons, portrayed the futurity of war as absolute, predetermined, everywhere, unending, and inescapable. Fries and West thus established the categorical certainty that chemical weapons would remain commonplace, but this certainty need not cause undue fear and panic because the universal application of chemical weapons was preservative not destructive.

This third “universal” level of augmented amplification therefore tied into an important element of their public relations campaign that sought to justify the use of chemical agents at home, on farms, and in industry as even more beneficial during peacetime than during wartime.³⁷⁰ Fries and West wrote that WWI’s chemical weapons “are aiding to-day and will continue to aid in the future the peaceful life of every nation.” Amplifying the power of chemical weapons entailed a complementary amplification of chemicals in general. The “unlimited value” of this “unlimited field” meant that *every* nation would embrace the dual uses of dangerous chemicals in *every* action.³⁷¹ According to the rationale that chemicals “aid” humanity in all of its endeavors, the global population should welcome chemicals to assist with disinfection, water purification, exterminating pests, dye making, quelling riots, incapacitating criminals, “humane”

hunting, doping airplane wings, developing photographs, perfuming, producing artificial fabrics, distilling gasoline, fertilizing, and curing the ill, for instance. The authors reconceived the humane extermination of wartime belligerents as using peacetime humane extermination for the preservation of humanity.³⁷² Fries and West thus granted chemicals a vast preservative power beyond their weaponization by framing them as essential to nurture and protect humanity from pests, disease, and famine. However, mass-producing chemical agents for all of these purposes meant that “every nation” would also be preparing for a massive chemical war. But this military preparation also could preserve life through deterrence, if every chemical power possessed equivalent arsenals. This is the paradox of “dual use” toxic chemicals: proof of the weapons’ usefulness derived from the combination of the peacetime and wartime functions. Fries and West thus used the material functionality of war gases as proof of the speculative adaptability of dangerous toxins to all human activities, and the speculative adaptability of chemicals to all activities proved the viability of maintaining the means to produce chemical weapons into perpetuity. Thanks in part to the advocacy of Fries and the chemical industry, unsafe chemicals would become commonplace in homes.

Thus Fries and West downplayed the effectiveness of mustard gas as a weapon by examining its statistical performance in WWI, and then amplified its preservative power to a permanent global scale. Despite taking a categorical stance in favor of chemical warfare’s preservative power, the instability of chemical warfare discourse slipped into the argument at times. The “gas is very deadly,” they wrote of mustard gas in what seems like a direct contradiction of their statistical proofs that argued that mustard gas was not so deadly at all.³⁷³ But, wartime and peacetime equaled *all time*, and thus Fries and West advocated a permanent state of being in which chemicals presented everyone with the contrary prospect of inviting a

weapon of mass destruction into the home to sanitize, exterminate, and grow food. Extermination and preservation became “universal” synonymous activities according to the logic of *Chemical Warfare*. The individual soldier’s problem, the “titanic struggle” between death and protection, became the world’s problem, and by implication so did the possibility of humanity’s humane self-extermination.

Conclusion

Fries’s and West’s publicity campaign had mixed success. They did not overcome the “psychology of gas training...which they never succeeded in fully solving” for the soldiers whom the CWS inculcated into the chemical warfare discipline, much less military command, politicians, and the public.³⁷⁴ Indeed, chemical warfare remains today a subject of humanitarian concern and vigorous opposition. But the CWS remained intact, albeit often underfunded and undermanned compared to its WWI heyday. The massive chemical weapons factory and proving grounds at Edgewood Arsenal often sat idle. However, their foundational pedagogy helped to train soldiers as the CWS continued both to research new weapons, tactics, and strategies, and to develop elaborate drills and instructions for troops.³⁷⁵ The publicity campaign, in conjunction with the emergent chemical industry, helped to legitimate the influx of mass-produced chemicals into almost every facet of American life as a preservative technology for agriculture, sanitation, and medicine.³⁷⁶ This process of saturating the globe with chemicals has, of course, also resulted in widespread anxiety, denunciation, and resistance. Thus, Fries and West did not surmount the Malthusian Paradox, and it continues to confront rhetors who participate in the discourse of chemicals.

The history of mustard gas between the world wars was also fraught with mixed results, as the weapon fell out of and into military favor.³⁷⁷ For the most part, narrow deterrence worked, and chemical powers desisted from gassing each other. Instead they saved their weapons for unprepared “uncivilized” enemies. In the 1930s, the Japanese Army deployed mustard gas during its “Rape of Nanjing,” and the Italian Army bombarded ill-clothed Ethiopians with it from airplanes. At intermittent times between world wars, the U.S. manufactured mustard gas at its large factories at Edgewood, Pine Bluff, Huntsville, and Rocky Mountain arsenals. Other states, powerful and weak, did likewise, stockpiling chemical agents prior to and during WWII.³⁷⁸ In battle, WWII belligerents ended up not gassing each other. But another Fritz Haber invention, Zyklon-B, continued to demonstrate the power of chemical weapons to annihilate within Nazi extermination camps. Meanwhile, a large-scale U.S.-Australian program of human mustard gas experimentation caused many thousands of casualties.³⁷⁹ The U. S. desisted from large-scale mustard gas manufacturing in 1968, but the ease of producing it from chemicals readily available for commercial uses means that the threat persists. Thiodiglycol (TDG), a common precursor chemical used in mustard gas production requires a simple one-step reaction – the addition of a chlorinating agent – to make mustard gas. Now, TDG is mass produced for commercial uses, such as rubbers, lubricants, stabilizers, antioxidants, inks, dyes, photographic and copying processes, antistatic agents, epoxides, coatings, metal plating, textiles, solvents, cosmetics, and arthritis medication. TDG “is more accessible today than it used to be in the early days of mustard gas production.”³⁸⁰ In addition to mustard gas’s common availability, “Its large-scale processing for that purpose seems relatively undemanding in terms of technology.”³⁸¹ Owing to this availability of TDG and the ease of converting it into mustard gas, an international TDG black market has emerged.³⁸²

Fries anticipated this diffusion of mustard gas knowhow, if not who would possess it. Fries argued that mustard gas and other chemical weapons posed an internal threat to the U.S. government if possessed by advocates of “the bloody terrorism of a Godless communism.”³⁸³ Mustard gas production did not require a massive military-industrial system, and Fries understood that the CWS might not retain monopolistic control of the new weapons. He wrote that “the use of gas by unauthorized persons may prove a very serious problem. Practically all of these gases are so powerful that an ample quantity can be carried in a pocket to make it very dangerous in an ordinary room or even entire buildings.”³⁸⁴ By turning his attention away from foreign armies to armed individuals, Fries’s rhetoric turned backward to the dynamite bomb talking that infused Haymarket discourse in which a few pocketed bombs seemed to possess unlimited destructive power. In fact, Fries and West had published a near complete how-to mustard gas production manual complete with various chemical formulas, photographs of Edgewood factory machinery, and detailed schematics of the German production method – information that could teach terrorists how to become battlefield chemists just as well as WWI U.S. Army conscripts. In its most basic form, as a textbook in the vein of anarchist Johann Most’s *Revolutionäre Kriegswissenschaft, Chemical Warfare* could empower revolutionaries, terrorists, and less-industrialized states to manufacture mustard gas. Fries thus recommended strict governmental oversight of chemical agents to keep the destructive power out of communists’ pockets.

Fries and West did not just look backwards for rhetorical invention though. Their argument about the necessity of chemical weapons to deter others’ use of chemical weapons helped to propagate what would become an essential logic of atomic bomb discourse – deterrence – which relied on the simultaneous capacity to preserve and destroy. When they used

statistical arguments and different levels of amplification to prove that chemical weapons are both “very deadly” and a humane preservative force, they implied the symbolic uses of the Bomb to control international relations. By deterrence logic, the Bomb would not work most effectively by annihilating people across the earth; it would work best by never getting used, never shedding blood, never killing, but by sitting poised for destruction. Deterrence meant purveying a perpetual fearful appeal to force that would preserve life by dissuading humanity’s own self-extinction.

²⁹¹ Fries and West, *Chemical Warfare*, 438. My historical understanding of chemical warfare in WWI relies most heavily on Edmund Russell’s *War and Nature*, Haber’s *The Poisonous Cloud*, and Fries and West themselves.

²⁹² Haber, *The Poisonous Cloud*, 192. Also known as “yellow cross” (for its German shell marking) “Yperite” (for the location of its first use), “blistering gas” for its effect on skin, and “Hun stuff” or “hot stuff,” for its military designation as “HS,” the mustard gas used in WWI, dichloroethylsulfide, is a formation of carbon, hydrogen, sulfur, and chlorine. Its chemical name is sometimes written dichloroethylsulfide, or bis-dichloroethylsulfide depending on its method of manufacture. Fries and West noted that “Like phosgene and chlorine used before [mustard gas], the materials for its production were available in considerable quantities through the manufacture of components for dyes or photographic chemicals” (*Chemical Warfare*, 175). German and Allied chemists used different processes to make mustard gas: Germans reacted “sodium sulfide with ethylene chlorhydrin to form thiodiglycol and chlorinating the latter compound by treating with gaseous hydrochloric acid.” Allies reacted “ethylene on sulfur chloride—which, under proper operating conditions, yields directly dichloroethyl sulfide.” Both reactions quoted from Hessel, Martin, and Hessel, *Chemistry in Warfare*, 170. As chemists and military personnel experimented with chemical weapons in laboratories, at proving grounds, and in battle, more destructive gases were developed. Hence, “mustard gas” refers to various chemical compounds akin to dichloroethylsulfide, and sometimes to a related family of “nitrogen mustards.” In 1943, University of Iowa chemists under the aegis of the OSRD experimented with 11 of nitrogen mustard compounds to find those with the most stability. Nitrogen mustards cause less injuries than mustard gas, acting first and foremost on eyes, but they have almost no odor which makes detection more difficult. Regardless of stability, ease of deployment, and chemical compound, what these compounds share are the similar physiological effects produced in victims. Coleman, *Report on “The Preparation and Stability of Nitrogen Mustards.”* The Proceedings of the NATO Advanced Research Workshop on Chemical Problems Associated with Old Arsenical and ‘Mustard’ Munitions used the term “Yperite” to distinguish the common WWI munition from other mustard agents. Coleman, “The Preparation and Stability of Nitrogen Mustards;” U.S. War Department, *Technical Manual No. 3-215*, 116. Bunnett and Mikołajczyk, *Arsenic and Old Mustard*. In *Gas and Flame*, Auld described the origin of the term “mustard gas”: “This smell to my mind is much more like garlic than mustard, and the use of the term ‘mustard gas’ is purely the invention of the Tommies themselves. As a matter of fact, so as not to confuse the Yellow Cross liquid with true mustard oil, efforts were made to prevent the stuff from being called mustard gas. But once the British Tommy decides on a name for anything, that name it is bound to have, and as he adopted the name ‘mustard gas’ for it mustard gas it will remain for all time” (179-180).

²⁹³ Whitehead, “Third Ypres,” 195.

²⁹⁴ Manley, “The Problem of Old Chemical Weapons,” 2. The British Army tallied almost as many British gas casualties in July, 1917 as all of the chemical warfare casualties in the previous two years. Fries and West, *Chemical Warfare*, 151.

²⁹⁵ F. G. Guthrie (1860), Niemann (1860), A. Riche (1855), and Despretz (1822) formulated it, or similar chemicals, prior to Meyer, but Meyer’s method became the standard for German industry.

²⁹⁶ Haber, *The Poisonous Cloud*, 189-190. American produced a large amount of mustard gas as well. 1,422,000 pounds of Edgewood mustard gas made it to Europe during the war. At peak production, its mustard gas factory could produce enough ethylene to make 40 tons of mustard gas a day with the products of its sulfur monochloride

plant that first produced 10 tons a day, but later 300 tons a day. It could produce 100 tons of chlorine a day. Meanwhile construction began on two other mustard gas factories at Hastings-on-Hudson and Buffalo, NY. All three plants together could produce hundreds of tons of mustard gas a day. Operating at less than peak capacity, the U.S. produced 900 tons of mustard gas per month by November, 1918. United States War Department, *Military Chemistry*, 123. The Allied and Axis Powers launched about 124,200 tons of chemical weapons, including 12,000 tons of mustard gas. Manley, "The Problem of Old Chemical Weapons," 2; and Hessel, Martin, and Hessel, *Chemistry in Warfare*, 95.

²⁹⁷ Fries and West, *Chemical Warfare*, 177.

²⁹⁸ Virilio, *War and Cinema*, 8.

²⁹⁹ Fries and West, *Chemical Warfare*, 175. According to Van H. Manning, Chief of the Bureau of Mines, "Of all the gases used during the war none equaled mustard gas in military effectiveness." *War Gas Investigations*, 16. In a letter to General Pershing from May 1, 1918 Fries promised the chief of American operations in Europe that "the war will be won by gas." If he did not concur that mustard gas would be the sole reason for victory, Pershing did concur that it worked well. In 1919 General Pershing wrote that "Whether or not gas will be employed in future wars is a matter of conjecture, but the effect is so deadly to the unprepared that we can never afford to neglect the question." Brown, *Chemical Warfare*, 30 and 72-73. The epithet "king of gases" stuck, and mustard gas became known as "king" in chemical warfare literature. Hessel, Martin, and Hessel echo that mustard gas was "the 'king of the battle gases.'" *Chemistry in Warfare*, 92. Brophy, Miles, and Cochrane also called it "king of the battle gases" (*From Laboratory to Field*, 62)

³⁰⁰ Allen, "Chemical Warfare, a New Industry," 33.

³⁰¹ A brief biography of Fries accompanies Fries, "Chemical Warfare," 423.

³⁰² Sibert, *1918*, 3. The bureau eventually consisted of nine divisions that oversaw the institutionalization of chemical warfare as an important new military endeavor: Administration, Training, Research, Medical, Development, Training, Proving, Gas Offense Production, Gas Defense Production, and European/Overseas Divisions. Gas training commenced during WWI and the army set up gas schools at Langres and Chaumont where 4,000 officers and 32,000 enlisted soldiers received instruction in chemical warfare. Sibert, *1919*, 3 and 12.

³⁰³ Fries remained a public figure, turning his attention to combating communist influence and publishing *Sugar Coating Communism for Protestant Churches* (1932) and *Communism Unmasked* (1937). In 1938 he became the editor of a "right wing" anti-communist educational bulletin called *Friends of the Public Schools of America*, a position he served until 1953. As a pundit, he often testified before Congress on educational matters. The *Bulletin's* motto was: "Keep church and state separate; Keep the public schools public." According to the bibliographic notes for The University of Iowa's "Right Wing Collection," "The Friends of the Public Schools of America is an organization devoted to the separation of church and state; therefore it opposes any governmental attempts to give public funds to sectarian (i.e., Catholic) schools. This organization opposes the National Education Association, Communist infiltration into American education, and attempts by teachers to use the strike in collective bargaining" (26). According to Ronald W. Evans, Fries and his wife, Elizabeth, "devoted their energies to promoting social patriotism." In 1935 he led an effort to ban communistic teachings from Washington, D.C. schools. Evans, *This Happened in America*, 147. Other than material reprinted from other newspapers and serials, almost all of the articles and opinion pieces are anonymous. However, I suspect that many of them are written by Fries. Once in awhile he will tip his hand, as in the piece about "glittering generalities" noted above.

Although a bulletin about education, Fries devoted a significant amount of space to military and other political issues. The publication took a negative position on the 1948 and 1951 Genocide Conventions, the 1950 Stockholm Peace Petition that sought to outlaw nuclear war, and the 1948 Universal Declaration of Human Rights, arguing that these proposals amounted to the first phase of implementing a world government that would destroy hard-won American freedoms. See Fries, "The Genocide Convention," 4; Fries, "The Stockholm Peace Petition," 1-3; and "Genocide Convention Side-Track for Human Rights Declaration," 5-6.

³⁰⁴ According to Frederic J. Brown, "With his dynamic personality and extensive contacts in Congress and the chemical industries, he quite literally kept the cws alive" (*Chemical Warfare*, 130). Edmund Russell called Fries "the single most influential individual in the history of American gas warfare" (*War and Nature*, 39). A British chemist who interviewed Fries stated in 1922 that "General Fries has become the recognised leader in the chemical warfare problem, and it may, without much fear, be said that to him primarily the service owes its present position" (Letters from America, 14).

³⁰⁵ Parsons, "The American Chemist in Warfare," 780. Parsons provides the most detailed history of the organization of American chemists during WWI. West's post-war work as a scientific bibliographer and librarian of sorts at the NRC, as Director of the Information Department, at Arthur D. Little, Inc., a management consulting

firm, and as research associate at the Institute of Paper Chemistry at Lawrence College, chronicled American science with dozens of NRC bulletins and bibliographies on topics as diverse as molasses, metallurgy, and conferred scientific doctorates.

³⁰⁶ In *Chemical Warfare*, the two authors quoted wholesale from papers found in chemistry journals and army files, and Fries and West acknowledged their rampant borrowing in the book's preface (vii). Much of *Chemical Warfare* compiled a series of papers written by Fries, while West published the book's first chapter on the history of chemical warfare in *Science*. The dual authorship appears to be a result of publishing separately-written papers under the same cover, rather than a result of collaborative writing.

Regarding Fries's authorship, "Gas in Defense," a paper held in the Munitions Supply Branch Library, is a draft of *Chemical Warfare*'s chapter "Defense Against Gas." "Chemical Warfare in Attack" is "The Offensive Use of Gas." "Gas in Attack and Defense" is a draft of the book's chapters of offensive and defensive chemical warfare and duplicates both "Gas in Defense" and "Gas in Attack." According to a footnote, Fries addressed students of the General Staff College in Washington on May 11, 1921, which became the basis for the *Chemical Warfare* chapter "Chemical Warfare in Relation to Strategy and Tactics" (363). "A History of Chemical Warfare in France," a paper held at the Edgewood Arsenal Historical Office, is probably a draft of *Chemical Warfare*'s "The Chemical Warfare Service in France," but I have been unable to verify this.

Regarding West's authorship, his "The History of Poison Gases" which is a reprint of his article in *Science*. West probably wrote all or the bulk of chapters 12-15 of *Chemical Warfare* on gas masks, absorbents, and other defensive measures, because gas masks and canisters were the focus of his research throughout 1918-1919 for the CWS Research Division at American University. West also wrote a general survey of the CWS's contributions to science, called "The Chemical Warfare Service."

Chapters 2, 3, and 4 refer to Fries in the third person, which perhaps indicates that West was sole or primary author of them. Other chapters do not refer to Fries in the third person, and Fries did not refer to himself in the third person in his other writings about chemical warfare. Later however, as editor of the *Friends of the Public Schools of America Bulletin*, Fries often referred to "the editor," which was Fries.

³⁰⁷ Carl W. Ackerman's introduction to Fries, "The Future of Poison Gas," 419.

³⁰⁸ Fries and West, *Chemical Warfare*, 65.

³⁰⁹ The Chemical Warfare Service, other military units, and civilian presses churned out chemical warfare textbooks throughout the 20th century apace with innovations in chemical agents, gas masks, and tactical and strategic methods. Training in gas preparation remained a constant concern as reflected by a 1942 technical manual which asserts that "the officer who expects to encounter chemical agents in the field must be thoroughly familiar with their physical and chemical characteristics, and should understand the general physical and chemical principles and laws which correlate the behavior of these agents with their properties." U.S. War Department, *Technical Manual No. 3-215*, 2. Other comprehensive "textbooks" in the tradition of Fries's and West's *Chemical Warfare* include *Gas and Flame in Modern Warfare* by Auld, the Army's *Chemical Warfare Service Field Manual*, *Chemicals in War* by Prentiss, *Chemical Warfare* by Wachtel, *Chemistry in Warfare* by Hessel, Martin, and Hessel, and *Gas Warfare: The Chemical Weapon, Its Use, and Protection Against It* by Waitt. [] Many other manuals on toxicology, medical treatment, gas masks, and other aspects of chemical warfare also appeared.

³¹⁰ Scott, *The Hague Conventions*, 116 and 225.

³¹¹ Article V also noted that most of the signatory powers had already banned chemical weapons in other treaties. Federal Trade Information Service, *Treaties and Resolutions*, 25.

³¹² Russell, *War and Nature*, 5. This passage appears often in chemical warfare advocacy, and Fries and West reproduced it *Chemical Warfare* (6).

³¹³ The concept of "humane war" had much older origins, and chemical weapons had been touted as humane since at least the American Civil War. According to military historians Bernard and Fawn Brodie's *From Crossbow to H-Bomb*, gunpowder spawned a popular 17th century myth that held "the invention of gunpowder made war less horrible," and a corollary claim held that, along with the compass and printing press, guns were one of the "three most beneficial" inventions. They quote John Donne's 1621 Christmas address. Donne said, "So by the benefit of this light of reason, they have found out Artillery, by which warres come to quicker ends than heretofore, and the great expence of blood is avoided; for the numbers of men slain now, since the invention of artillery, are much less than before, when the sword was the executioner" (70). In 1864, B. W. Richardson wrote: "I do not see that humanity should revolt, for would it not be better to destroy a host in Regent's Park by making the men fall as in a mystical sleep, than to let down on them another host to break their bones, tear their limbs asunder and gouge out their entrails with three-cornered pikes; leaving a vast majority undead, and writhing for hours in torments of the damned?" Quoted in Fries and West, *Chemical Warfare*, 5.

³¹⁴ Haldane, *Callinicus*, 52-53.

³¹⁵ Although “inhuman” and “inhumane” (and “human” and “humane”) connote different meanings, chemical warfare writers tended to treat these terms as synonymous. Fries and West, for instance, posed “humane” versus “inhuman.” To rank the two words in terms of their negative connotations, “inhuman” perhaps ranks as more derogative than “inhumane.” “Inhuman” connotes that its object is so despicable that it is beyond the scope of how humanity should be defined. “Inhumane” connotes that its object is at least “human,” but that its object is constrained by ethical and moral proscriptions. In *War and Nature*, Edmund Russell called the principle that any war-related activity can be conceived of as humane the “ideology of ‘civilized war’” (4). My analysis treats the two terms as synonymous. I have not found any indication that any participant in chemical warfare discourse has given a clear indication that he or she intended to connote one level of negative or positive description rather than another by using these terms.

³¹⁶ Haldane, *Callinicus*, 7.

³¹⁷ Fries, “Annual Report 1921,” 226. In a popular press article in *Current History*, Fries wrote almost the same of chemical bombs, which “have vastly decreased the possibilities of another long war. Every development of science that makes warfare more universal and more scientific makes for permanent peace by making war intolerable; and I, for one, believe that all nations should be given to understand that if we are forced into a war we shall use every known chemical method of warfare against hostile forces wherever they are located. That would be our permanent guarantee against attack” (Fries, “The Future of Poison Gas,” 422). Fries and West also proclaimed, “Let the world know that we propose to use gas against all troops that may be engaged against us, and that we propose to use it to the fullest extent of our ability. We believe that such a proposition will do more to head off war than all the peace propaganda since time began.” Furthermore, Fries and West averred in *Chemical Warfare* that if science gets pushed to the technical limits of producing destruction, “the end of war should be in sight” (433). Fries and West, *Chemical Warfare*, 371-372. In his Annual Report of the CWS for 1920, Fries made the same assertion, using the term “deter.” He wrote: “The knowledge among other countries that the United States is doing this [chemical warfare preparedness] will go a long way toward deterring them from forcing hostilities, knowing that the United States with its incomparable natural resources and highly developed manufacturing possibilities will be able to manufacture and to deliver on the field of battle a greater quantity of chemicals than any other single nation, or indeed any other group of nations.” Quoted in Brown, *Chemical Warfare*, 86-87. Fries wrote in “The Future of Poison Gas” that “The last year has seen also the absolute triumph of the most scientific nations over the savage, through the development of chemical warfare and aviation. No longer can an uprising in any country on the globe amount to anything unless those in control of it are supplied with the necessary aviation and chemical warfare materials” (420).

³¹⁸ The bulletin attributes the quote to Fries and not to West. Fries and West did make the caveat that abolishing war would also entail political negotiations, but their book clarified that chemical weapons would constitute the first significant step toward global reconciliation. Fries, it should be noted, detested the idea of “world government,” and when he edited the *Friends of the Public Schools of America Bulletin*, he and his wife Elizabeth who acted as associated editor, printed many anti-world government articles.

³¹⁹ British ambassador to the 1922 Conference on the Limitation of Armament, Arthur James Balfour, used this epithet to describe chemical warfare. Quoted in Fries, “Annual Report 1922,” 278.

³²⁰ Fries, “Uses and Dangers of Poisonous Gases,” 55. In early 1918, Fries even suggested to Pershing that the Army should gas the enemy without regard for civilian casualties. The Army did not pursue his suggestion and later he would advocate aerial gassing of only military targets. Brown, *Chemical Warfare*, 45, f.n. 98 and 164, f.n. 84.

³²¹ Irwin, *The Next War*, 44. Partially quoted in Brown, *Chemical Warfare*, 179-180. Irwin’s book went through nine printings between April and August, 1921.

³²² Fries and West, *Chemical Warfare*, 176. Mustard gas “attacks the whole respiratory system producing inflammation of the trachea and bronchi with necrosis of the mucous membrane. U.S. War Department, *Technical Manual No. 3-215*, 117.

³²³ Reports of mustard gases’ toxicological profiles are numerous. The first book-length medical report of dichlorethylsulphide was Warthin and Weller’s *The Medical Aspects of Mustard Gas Poisoning*, published in 1919, which drew from 49 already-published articles on the topic. “Exposure for a few minutes to a concentration of one part per 12 million parts of air causes irritation and fatal results follow exposure of thirty minutes to a concentration of one part per 30,000 parts per air.” Hessel, Martin, and Hessel, *Chemistry in Warfare*, 170. Initial appraisals also believed that its physiological effects were, for the most part, temporary and non-lethal, but the long-term health consequences for mustard gas casualties included a vast array of correlated health problems that often caused death long after the war or exposure during testing. See Pechura and Rall, *Veterans at Risk* and Goodwin, *Keen as Mustard*.

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- ³²⁴ The description seems to indicate an attack with multiple types of gas – mustard, from the relative silence of the shells and the blisters, and perhaps phosgene or chlorine from the choking and drowning. Owen wrote slightly different versions of “Dulce et Decorum est.” This version quoted in Gilbert, *The First World War*, 352-353.
- ³²⁵ Brice, *The Battle Book of Ypres*, 36-37.
- ³²⁶ Hessel, Martin, and Hessel, *Chemistry in Warfare*, 93; Brice, *The Battle Book of Ypres*, 182.
- ³²⁷ Auld’s *Gas and Flame* might be the source of this description (178). The German Army could have launched many more mustard gas shells in the Fall of 1917 than they did, but the gas’s persistency and toxicity caused the German army to pause to reconsider how to capitalize on these advantages without threatening its own troops.
- ³²⁸ Steel and Hart, *Passchendaele*, 279; and Macdonald, *They Called It Passchendaele*, 87.
- ³²⁹ Macdonald, *They Called It Passchendaele*, 87-88.
- ³³⁰ “Drops Balls of Gas on American Lines.”
- ³³¹ Brown, *Chemical Warfare*, 37.
- ³³² Warthin and Weller, *The Medical Aspects of Mustard Gas Poisoning*, 20.
- ³³³ Fries and West, *Chemical Warfare*, 426.
- ³³⁴ Allen, *Toward the Flame*, 92.
- ³³⁵ Allen, *Toward the Flame*, 93.
- ³³⁶ Brown, *Chemical Warfare*, 36.
- ³³⁷ Jones and Wessely, *Shell Shock to PTSD*, 40. Even chemical warfare advocate Prentiss acknowledged that “Nothing breaks a soldier’s will to fight so quickly as being gassed, even slightly. His imagination magnifies the real injury a hundredfold.” Quoted in Brown, *Chemical Warfare*, 153.
- ³³⁸ Fries and West, *Chemical Warfare*, 89.
- ³³⁹ “Submarines and Gas Condemned by Public.” Quoted in Brown, *Chemical Warfare*, 69.
- ³⁴⁰ See the front matter in Fries and West, *Chemical Warfare*.
- ³⁴¹ Kleber and Birdsell, *Chemicals in Combat*, 653.
- ³⁴² Fries and West, *Chemical Warfare*, 89.
- ³⁴³ General John J. Pershing was a notable pro-gas military commander. Along with armistice came a 97% demobilization of the CWS and millions of dollars of unfilled chemical production contracts. Brophy, Miles, and Cochrane, *The Chemical Warfare Service: From Laboratory to Field*, 24; and Fries, “Annual Report 1921,” 222.
- ³⁴⁴ Fries and West, *Chemical Warfare*, 90.
- ³⁴⁵ Reproduced in Brown, *Chemical Warfare*, 79.
- ³⁴⁶ In his foreword to *Chemical Warfare*, retired Major General William L. Sibert, whom Fries had just replaced as head of the CWS, described their pedagogical onus in terms of the public: “I trust that perusal [of the book] will create a public opinion that will insist upon chemical preparation for war” (x). Neither Sibert nor Fries and West originated this commonplace. It appears in both the “Publisher’s Note” and main text of Auld’s *Gas and Flame in Modern Warfare*. According to the publisher, ““Need for the education of vast numbers of men in various branches of Gas Service and those in camps on the position of Gas Warfare at the front, has made imperative the publication of this book, as has also the need of educating the public, owing to the many misleading newspaper reports, sometimes merely misinformative, sometimes distinctly mischievous, appearing from time to time” (v). Auld reiterated that, “So much had been written about this gas and so many mis-statements have been made concerning it that it is as well for the public to understand what mustard gas is, what it can do and what it cannot do” (169). Haldane wrote in *Callinicus*, “If, then, in future wars we are to avoid gross mismanagement in high places, and panic and stupidity among the masses, it is essential that everyone should learn a little elementary science, that politicians and soldiers should not be proud of their ignorance of it, that ordinary men and women should not be ashamed or afraid of knowing something of the working of their own bodies” (72). Decades later, Hammond wrote in *Poison Gas*: “The entire Free World, despite its intellectual sophistication, is being held hostage by fear. This fear of the unknown had proliferated for the past 80 years through propagand, unsound pronouncements of world leaders and misleading labels compounded by a public press that has neglected its own mandate to seek out and tell the truth. The culprit is the notion of gas as a weapon” (ix).
- ³⁴⁷ Fries and West, *Chemical Warfare*, 374, emphasis theirs. This belief in American fear and ignorance among chemical warfare advocates persisted. As Waitt put it during WWII, “Only the ignorant need fear gas.” *Gas Warfare*, 171.
- ³⁴⁸ Fries and West, *Chemical Warfare*, 414. According to one account of his pedagogical goals, Fries believed that chemical warfare is “a matter of vital public importance, on which the public cannot have too much enlightenment. He relies, in fact, for the success of his case on his appeal to public intelligence.” Fries, “Letters to America,” 15.
- ³⁴⁹ Fries and West, *Chemical Warfare*, vii.

³⁵⁰ Fries and West, *Chemical Warfare*, 370.

³⁵¹ Fries and West, *Chemical Warfare*, 438.

³⁵² Fries understood the persuasive force of well-placed statistical argument as evidenced by a Memorial Day address he delivered in 1931. He said, “There is an old and very true saying that ‘Figures won’t lie, but liars will figure...I say this just before I quote you some figures...’” “Memorial Day, 1931,” 3.

³⁵³ Fries and West, *Chemical Warfare*, vii.

³⁵⁴ Fries and West, *Chemical Warfare*, 388. It is difficult to ascertain the origin of this commonplace, which could have been Fries. In “Is Chemical Warfare More Inhuman than Gunfire?” Francine states that Fries “has dealt with this subject in a masterly and interesting way” (5). For similar statistical arguments that claim that actual casualties and fatalities that chemical warfare is not inhuman, see Colonel C. F. Brigham’s (of the Chemical Warfare Service) and W. Lee Lewis’s (the inventor of Lewisite) arguments in Villard, “Poison Gas,” 32; Crowell and Wilson, *The Armies of Industry*, 490-491; Francine, “Is Chemical Warfare More Inhuman than Gunfire?” 2; Haldane, *Callinicus*, 27 and 32-33; Gilchrist, *A Comparative Study of World War Casualties*, 46-50; Waitt, *Gas Warfare*, 5; United States Bureau of Naval Personnel, *Gas! Know Your Chemical Warfare*, 9; Hammond, *Poison Gas*, 35; Mauroni, *America’s Struggle with Chemical-Biological Warfare*, 5-6.

³⁵⁵ Fries and West, *Chemical Warfare*, 169. An “official list of casualties in battle as compiled by the Surgeon General’s office” cited by Fries and West calculated that chemical agents caused “1,400 of 46,519” of U.S. fatalities (388).

³⁵⁶ Fries and West, *Chemical Warfare*, 171.

³⁵⁷ Fries and West, *Chemical Warfare*, 417.

³⁵⁸ The “lethal concentration” of mustard gas is “30-minute exposure to 0.07 oz./1,000 cu. ft. air (when breathed).” War Department, *Military Chemistry*, 122. A “minimum effective concentration” of mustard gas that produces casualties is one part mustard gas to 12,500,000 parts of air. Manning, *War Gas Investigations*, 26.

³⁵⁹ Fries and West, *Chemical Warfare*, 86.

³⁶⁰ Fries and West, *Chemical Warfare*, 86-87.

³⁶¹ Fries and West, *Chemical Warfare*, 388. Similar passages appear on pp. 13 and 370. Chief of the CWS, Major General William Sibert, whom Fries later replaced, wrote in his 1918 official report that “gas is twelve times as humane as bullets and high explosives.” Sibert, 1918, 17. The difference between the 27.3 percent and 27.4 percent rates might be attributable to their use of different sources, or they may have been referring to different types of casualties, e.g., American casualties versus total war casualties.

³⁶² Fries and West, *Chemical Warfare*, 386.

³⁶³ Clausewitz, *On War*, 83-85.

³⁶⁴ Fries and West, *Chemical Warfare*, 150 and 176.

³⁶⁵ Fries and West, *Chemical Warfare*, 169. Also see pp. 178-179 and 437.

³⁶⁶ Fries and West, *Chemical Warfare*, 178. Fries reiterated a similar claim in a 1925 speech in which he said, “The battlefield today is not only the land occupied by our fighting forces but the whole country from boundary to boundary. Disaster may strike us thousands of miles from the cannons’ roar.” “Address, September 1, 1925,” 2.

³⁶⁷ Fries, “Chemical Warfare,” 424. Fries’s 1921 *Annual Report of the Chemical Warfare Service* echoed total war theory. He wrote, “The wars of to-day and those of the future will involve every activity of a nation and every inhabitant of that nation” (226).

³⁶⁸ Fries and West, *Chemical Warfare*, 383. Fries elaborated this claim in his essay “The Future of Poison Gas” where he wrote, “The war of today and of the future will involve every activity of a nation and of every inhabitant of that nation. The development of sanitation and preventative medicine, which has made possible the continual growth of great cities, has made possible also the maintenance in the field of numbers of men limited only by the manpower of nations” (421). Elsewhere in *Chemical Warfare* Fries and West concluded by concurring with Sibert’s preface to *Chemical Warfare* that “chemical materials as such become the most universal of all weapons of war” (436). In his 1924 CWS Report, Fries stated that “Chemistry is the most universal of sciences today and the most necessary to progress” (12), a sentence he reproduced in “The Deadly Weapons of Chemical Warfare” (435).

³⁶⁹ Fries went as far as expressing hope in his “Annual Report of 1922” that a study showing that mustard gas retarded the development of tuberculosis in guinea pigs would “believed there is a great field of usefulness for mustard gas from a prophylactic point of view” (282).

³⁷⁰ See Fries and West, *Chemical Warfare*, 427-434. Given an audience, Fries almost never failed to trumpet the peacetime uses of war gases, whether addressing veterans on Memorial Day and students at the Army Industrial College, reporting the annual business of the CWS to the President, writing about the “By-Products of Chemical Warfare” in *The Journal of Industrial and Engineering Chemistry*, *The Military Engineer*, and the popular monthly

Illustrated World, testifying before Congress, or writing letters. He distributed a sample pro-CWS resolution for chemical industry professionals to send to their congressmen. See Brown, *Chemical Warfare* 79.

³⁷¹ Fries and West, *Chemical Warfare*, 427, 433, and 436.

³⁷² See Russell, *War and Nature*.

³⁷³ Fries and West, *Chemical Warfare*, 169.

³⁷⁴ Fries and West, *Chemical Warfare*, 414-415. In a more famous example of continued opposition to gas, President Roosevelt, upon vetoing the designation of the CWS the Chemical Corps and making it its own branch of the U.S. Army, wrote that "It has been the policy of this Government to do everything in its power to outlaw the use of chemicals in warfare. Such use is inhuman and contrary to what modern civilization should stand for." Quoted in Brophy and Fisher, *The Chemical Warfare Service*, 22.

³⁷⁵ See United States War Department, *Chemical Warfare Service Field Manual*.

³⁷⁶ See Russell, *War and Nature*.

³⁷⁷ In 1991 SIPRI (Stockholm International for Peace Research Institute) calculated that more than 200,000 tons of mustard gas had been manufactured since 1916. Robinson and Trapp, "Production and Chemistry of Mustard Gas," 6.

³⁷⁸ The U.S., the U.K. France, Canada, Poland, the U.S.S.R., Hungary, Italy, Japan, and Germany all produced mustard gas "in significant quantities." The U.S. manufactured about 80,000 tons. Manley, "The Problem of Old Chemical Weapons," 6-7.

³⁷⁹ See Goodwin, *Keen as Mustard*.

³⁸⁰ Sutherland, "Thiodiglycol," 28; and Robinson and Trapp, "Production and Chemistry of Mustard Gas," 6.

³⁸¹ Robinson and Trapp, "Production and Chemistry of Mustard Gas," 6. Compare, "Thus, the TDG route [to mustard gas production] does not require a particularly sophisticated technological base for its conversion to mustard gas. TDG is also readily obtainable and easy to handle...there are hundreds of firms involved in some aspect of TDG commerce." Kaplan, et al., "Summary and Conclusions," 127.

³⁸² Sutherland, "Thiodiglycol," 24.

³⁸³ Fries, "Memorial Day Address, 1931."

³⁸⁴ Fries, "Uses and Dangers of Poisonous Gases," 56.

Chapter 5

Peaceful Bombs: Pragmatic Idealism in the Correspondence of Leo Szilard

“Do not destroy what you cannot create.”³⁸⁵ —Leo Szilard

Leo Szilard’s flash of insight in 1933 has become an atomic legend.³⁸⁶ As the Hungarian scientist waited for a red light and crossed London’s Southampton Row, his thoughts turned to a speech by nuclear physicist Lord Ernest Rutherford and to H. G. Wells’s 1914 novel *The World Set Free*. Szilard pondered how to break apart atoms to produce a vast amount of power. Rutherford said it was impossible. Wells imagined that it was. But in *The World Set Free*, the international proliferation of nuclear power and atomic bombs leads to global devastation and the subsequent creation of a world government. In Wells’s doomsday vision, “the whole world was flaring then into a monstrous phase of destruction. Power after power about the armed globe sought to anticipate attack by aggression. They went to war in a delirium of panic, in order to use their bombs first.”³⁸⁷ Owing to the ease of obtaining the “simple apparatus,” no institution could control the annihilation once it started. Wells wrote, “The power of destruction which had once been the ultimate privilege of government was now the only power left in the world—and it was everywhere.”³⁸⁸ So, when Szilard conceived how to create a nuclear chain reaction by dividing neutrons in 1933, the same year Wells predicted someone would make such a discovery, he conceived fission with a mental backdrop of utter destruction. Wells had taught him that the horrors of atomic war could overshadow the development of atomic energy, or make peace impossible. Despite such catastrophic predictions, Szilard became by his account, “obsessed” with the idea of fission.³⁸⁹

His early work on fission as well as his political foresight helped to spur the Manhattan Project.³⁹⁰ Szilard's most notable writing was an August 2nd, 1939 letter sent to President Roosevelt, through Albert Einstein's mediation, and with Einstein's signature. It resulted in Roosevelt setting up the Advisory Committee on Uranium and appointing Lyman Briggs to lead the investigation into nuclear energy's potential. Later, as an important member of the Project's Metallurgical Laboratory at the University of Chicago he constructed with Enrico Fermi the first atomic "pile," or reactor, and worked on reactor cooling systems.³⁹¹ Although he helped invent the Bomb and somewhat influenced its use, by the time of the Trinity test on July 16, 1945, Szilard had little political leverage left to direct scientific and governmental policy, though he still sought it avidly. In fact, his persistent attempts to influence policymakers to refrain from dropping the atomic bomb and to negotiate patent rights with the government were regarded by Manhattan Project managers as meddlesome and possibly treasonous. Chief of the Chicago Metallurgical Laboratory, physicist Arthur Holley Compton suggested to Gen. Leslie R. Groves, the military chief of the Manhattan Project, that the Army should spy on Szilard's contrarian activities. Groves himself thought Szilard a "villain," decrying "as far as I was concerned he might just as well have walked the plank!"—even as Groves conceded that the U.S. would not have produced the Bomb without Szilard's insistence.³⁹²

Nevertheless, Szilard persisted. His advocacy helped to pass the Atomic Energy Act of 1946, which granted control of atomic energy to the Atomic Energy Commission, a civilian group, rather than to the military.³⁹³ It also helped form the *Bulletin of the Atomic Scientists*, organized the Pugwash conferences that brought together leading international nuclear physicists, and founded the political action committee "Council for a Livable World," which today still lobbies for arms control and raises campaign money for like-minded politicians.

Consequently, Szilard won the 1959 Atoms for Peace award with physicist Eugene Wigner. But through this all, Szilard found himself in paradoxical positions: his professional stake in atomic power tempered his capacity to vilify the horrors of atomic war, and his moral repugnance toward atomic war tempered his capacity to tout the weapon. From his earliest insight into fission in 1933 to the bombing of Hiroshima, Szilard depicted scenarios of atomic annihilation in order to make his research sound appealing to military and political leaders. At the same time he argued for a type of atomic preservation – the hopes that nuclear power might in some way deter aggression and sustain humanity with an unlimited energy source. His writings were thus paradoxical as he simultaneously sought to create the most powerful weapon imaginable and to save the world from wartime destruction. Szilard believed that an American Bomb would create “a more livable world.”³⁹⁴ Yet he helped manufacture a more killable world.³⁹⁵ As such, much like Thomas Malthus, August Spies, and Amos A. Fries before him, Szilard had historical, political, and technological aspirations that confronted the Malthusian Paradox.³⁹⁶ His life’s work was focused on developing a technology that might be the means by which humanity annihilates itself, or might be the means by which humanity preserves itself from annihilation.

His rhetorical negotiation of the Paradox is best observed in his correspondences – the letters and memos he wrote to scientists, politicians, and technocrats to spur research into nuclear fission and the U.S.’s pursuit of atomic bombs, to advise how to organize the Manhattan Project, to advocate how to use atomic bombs, and to advance the ultimate abolishment of the weapon. These documents circulated to a limited but influential audience of persons, often with the authority to implement recommendations or convey them to powerful politicians. More than his more public documents—from speeches to articles and fiction—Szilard’s letters and memos had direct import for the development of the atomic bomb in the American arsenal and in American

policy. They thus provide a glimpse into Szilard's most consequential, historically speaking, rhetorical efforts to negotiate the Paradox.

I argue that Szilard confronted the Paradox in paradoxical fashion. Whereas Spies negotiated the Paradox by exploiting the instabilities of language and logic, and Fries and West attempted to stabilize them, Malthus relied on paradox throughout his correspondence. Specifically, Szilard asserted that he and other nuclear physicists best understood the full technical and political ramifications of atomic bombs, and therefore they should have enough political leverage to influence the militant or "peaceful" uses of atomic energy. As he attempted to gain a level of persuasive authority in between the realms of science and government, Szilard relied on paradox to do so. Paradox allowed him to seemingly hold not only two contrary positions at once, but two rhetorical *ethoi*—that of the "disinterested" scientist, on the one hand, and that of the wily political advocate on the other. Such a paradoxical *ethos*, I argue, not only buttressed Szilard's argument for the scientific *and* political authority of the scientific community, but also enable him to negotiate the paradoxical rhetorics of nuclear deterrence and the "pragmatic idealism" that underwrote it.

The remainder of this chapter unfolds in three parts. First, I examine Szilard's contrary *ethoi*. Second, I describe how he delved into deterrence policy debate – a debate itself fraught with paradoxical discourse – with his own version of "atomic bomb talking." Third, I describe how Szilard's rhetoric exhibited a logic of pragmatic idealism that his personal model of communication corroborated, and that his eventual advocacy of "minimal deterrence" exemplified. But all this, I suggest, was premised on the logic of fear. I therefore conclude by examining Szilard's desire to instill fear of the Bomb in humanity.

An Appeal to the Disinterested Scientific Ethos, Impassioned Atomic Bargaining, and Building a Unified Scientific Voice

Szilard used the overarching logic that atomic bombs could bring both annihilation and preservation to situate scientists between scientific work and policy advocacy, and to carve out a legitimate scientific presence in politics. He was caught between two ideals, one scientific and the other political, that presented him with the difficult rhetorical task of convincing two disparate audiences about what they should do about atomic bombs. Szilard therefore faced a near impossible dilemma to persuade scientists that they should think more like politicians, and to persuade politicians to think more like scientists. While Szilard attempted to get nuclear physicists to maintain inconspicuous secrecy about the probable destructive results of their research, he provoked politicians to legitimate that research—only to aver that the government should abandon atomic bombs as counterproductively too destructive.

Among his scientific colleagues, Szilard argued for the importance of a disinterested scientific ethos for both political integrity and political effectiveness. But for Szilard, this disinterested ethos was elusive in his interactions with politicians and technocrats, with whom he was zealous, wily, and provocative. Such tension between his *ethoi* suggested a larger communicative tension between science and politics. Szilard seems to have recognized this tension, and his efforts to build a cohesive, authoritative, and collective scientific voice for nuclear policy debates can be understood as an ambitious attempt to resolve it. In a high stakes endeavor to devise wartime nuclear policy, where much chaos, complexity, and rhetorical instability competed with dogmatic categorical convictions and rhetorical rigidity, Szilard's paradoxical rhetoric revealed a simple truth to both scientists and policymakers: they wielded the simultaneous capacity to annihilate humanity and to preserve it. Therefore, they should formulate

policy with utmost prudence, and only the unified voice of the scientific community offered the most knowledgeable voice for policymakers to heed. Szilard's work on fission in the lab and his *realpolitik* work in policy debates thus helped ensconce the Malthusian Paradox as a bureaucratic and political problem at the highest administrative levels of governance.

Disinterested Scientific Ethos

When Szilard corresponded with physicists in 1935 and 1936 regarding how they should share nuclear research, he urged “disinterest.”³⁹⁷ In Szilard's usage, “disinterest” referred to an objective scientific freedom from any personal interests that could derive from experimentation. Physicists must, Szilard argued, remain aloof from base personal motives lest they appear mercenary. In a June 3, 1935 letter to physicist F. A. Lindemann Szilard, recommended two principles to remain objective toward fission: (1) physicists should keep their research secret, only sharing it with trusted colleagues, and (2) they should apply for patents only when they knew what their political or technological applications would be. These two principles, however, were more than recommendations; they indicated the type of scientific ethos Szilard wanted his colleagues to exhibit.

This ethos was especially critical before the powers of atomic energy. The military and financial ramifications entailed by releasing an inordinate amount of explosive energy did not seem to allow for much impartiality. But Szilard saw that displaying such an objective attitude could benefit physicists by later situating physicists as the best arbiters of how to use the products of their own invention, whether for annihilation amidst the chaos of war, or for monetary gain in a stable peacetime economy. In a May 27th, 1936 letter to physicist John D. Cockcroft Szilard wrote, “If such multiple neutrons exist, we may envisage, if we wish to do so,

the theoretical possibility of an industrial revolution in a not too distant future. In that case patents might be used by scientists in a disinterested attempt to exercise some measure of influence over a politically dangerous development.”³⁹⁸ If physicists published fission theory too soon, a dangerous government could appropriate it – like that of Nazi Germany – or its industrial implications might not be apparent, which could stifle their careers. Constructing a disinterested ethos was thus, in part at least, a rhetorical strategy meant to pay off later, depending upon how history would unfold, with either political leverage regarding foreign policy or economic leverage regarding atomic power.

In one respect, this scientific ethos was a soft approach to moderate between malicious international politics and what Szilard saw as a general tendency among scientists to ignore the political ramifications of their research.³⁹⁹ In March, 1936, Szilard made this goal explicit in a letter to Enrico Fermi: “I feel that I must not consider these patents as my private property and that if they are of any importance, they should be controlled with a view of public policy.”⁴⁰⁰ Regarding his theoretical fission patents, Szilard wrote to famed nuclear physicist Lord Ernest Rutherford the same day he wrote to Cockroft (May 27th, 1936): “I cannot consider patents relating to nuclear physics as my property in any sense whatever. It would seem that if such patents are important, they ought to be administered in a disinterested way by disinterested persons.”⁴⁰¹ Other scientists, Szilard intimated, should have the same goal. In this way some measure of substantial control might be exerted over the political appropriation of their science.

But to achieve this goal, scientists needed to think in terms of politics and economics. The disinterested scientific ethos entailed for Szilard a political and economic appeal, and therefore it was not just a matter of “good science.” He described how the most direct action that nuclear physicists could take to gain political leverage was to eschew potential monetary gain

from fission. Refusing compensation would dissociate their work from business, politics, and the military, even though Szilard knew it would be bound to all three realms. “It would not seem right to me that physicists who take out such patents should derive financial or other privileges from them and some sort of disinterested control ought to be found, if industrial applications are considered to be of some importance,” Szilard wrote in the same 1936 letter to Cockcroft.⁴⁰² Abandoning financial considerations meant nuclear scientists could work for the common good in politics without conflicting interests.

These positions were articulated as Szilard pursued atomic energy in a concerted and aggressive manner, with full awareness of its weapons application. Thus, even as he urged an impartial ethos, his ethical position, as one of the producers of atomic-bomb knowhow, was already precarious. Getting rich from a technology capable of destroying the entire world would corrupt any potential political wisdom they might gain from their unique technical knowledge. They would be seen as military-industrial partisans rather than sage intellectuals. For this reason, Szilard indicated that physicists might retain or gain traction over the political uses of fission by absolving themselves of profit. But as the atomic bomb moved from being a theoretical possibility to an imminent one, Szilard could not remain disinterested. He was deeply disquieted. The impartial attitude on the part of nuclear scientists that he had hoped would position him and his colleagues to save the world from ruin itself began to appear more and more precarious. With the annihilation or preservation of humanity in the balance, Szilard recognized that the disinterested scientific ethos was no longer rhetorically viable.

Atomic Realpolitik

In the 1930s, in addition to urging scientists to maintain a disinterested scientific ethos, Szilard had exhorted scientists to keep their research secret by adopting a form of “private publication.”⁴⁰³ But with the usefulness of their scientific ethos for gaining political clout cast in doubt, Szilard devised that releasing his research might be another way to leverage a place for both him and his science in government circles. His push for funding became more urgent after his joint fission experiments with Fermi in 1939 and the knowledge that Nazi Germany was pursuing an atomic weapon. He faced an overwhelming rhetorical task as he, an unknown foreign exile, attempted to insert himself into American politics as *the* expert on atomic bombs. He simultaneously argued that atomic bombs were a means to use annihilation to bring immediate peace, but the means to post-war peace would bring ultimate annihilation. Thenceforward, Szilard dropped his disinterested scientific ethos and became an impassioned advocate.

Szilard began to use the tactics of *realpolitik*—subterfuge, provocation, and threats—to navigate and influence political power structures to fund his research. He engaged in a risky type of atomic bargaining, insinuating that he would release information about how to build a catastrophic weapon (to scientific publications, other governments, or industry) if the government refused to back his work with official money and power. The implication of his threat was apparent: if the U.S. wanted to assure its own preservation in the face of a looming global war, then it needed to fund Szilard’s project. If the U.S. government would not fund him, then other entities, including Germany, could wield Szilard’s theory of nuclear power simply by reading about fission in respected physics journals.

Szilard's first foray into *realpolitik* with FDR's government involved generating governmental interest in his research when there was little. On April 5, 1940, after his and Einstein's joint letter to President Roosevelt failed to produce immediate funding, Szilard wrote to John T. Tate, editor of *The Physical Review* regarding his paper, "Divergent Chain Reactions in Systems Composed of Uranium and Carbon." "I am anxious that this manuscript should not be sent to print until I have definitely heard from the Administration that there is no objection to its publication," wrote Szilard.⁴⁰⁴ In fact, the government appeared to have zero interest in whether Szilard published the manuscript or not. Later, he reflected that "I had assumed that once we had demonstrated that in the fission of uranium neutrons are emitted, there would be no difficulty in getting people interested; but I was wrong."⁴⁰⁵ Szilard hoped that by convincing Tate of the national importance of his research, he could use publication—more directly, the threat of publication—to push the administration to pay more attention. His major problem was thus generating interest in his research at the same time his priority was secrecy.

The next month, still waiting for the government to step in and fund a classified research project into fission, Szilard got Einstein to voice his appeal. As a foreigner and a political outsider who lacked a more straightforward means to make his recommendations known to the upper echelon of the U.S. government, he had few options other than using Einstein's authority to obtain some political clout. In March, 1940, Einstein wrote to Alexander Sachs, one of Roosevelt's scientific advisors and Szilard's and Einstein's presidential intermediary.

Dr. Szilard has shown me the manuscript he is sending to the Physics Review in which he describes in detail a method for setting up a chain reaction in uranium. The papers will appear in print unless they are held up, and the question arises whether something ought to be done to withhold publication. The answer to this question will depend on the general policy which is being adopted by the Administration with respect to uranium.⁴⁰⁶

Opaque when taken out of context of Szilard's correspondence over the preceding year, Einstein's reference to uranium policies alluded to Szilard's initial attempts to get the U.S. to intercede in the world uranium market to retard German bomb research.⁴⁰⁷ Using Einstein as an intermediary, he wanted to begin influencing how the U.S. government acted toward the discovery of fission, especially regarding whether it would initiate the foreign policies necessary to guarantee the U.S. could secure uranium deposits instead of Germany. Szilard's appeal, as conveyed by Einstein's letter, elucidated his grander ambitions. He did not want to control only the first atomic pile's mere documentation. He was interested in more than "holding his papers up" and secrecy. Szilard wanted to move from being a scientific expert to a policy advisor.

This ploy worked, as the Briggs Committee granted a modest \$4,000 for his and Fermi's experiments. The next month, in June of 1940, the Office of Scientific Research and Development [OSRD], under the directorship of Vannevar Bush, took over uranium research, which marked the first systematic stage of the U.S. government's organization of the Manhattan Project.

Szilard's and Einstein's pressure had secured governmental interest in nuclear research, but in October, 1940 Szilard thought progress was still too slow and funding inadequate, so he increased the intensity of his provocation. He wrote to Prof. George B. Pegram chair of Columbia University's Physics Department (where Szilard was supposed to begin his research) that the U.S. government had provided "no assurance that further support will be forthcoming."⁴⁰⁸ Consequently, he suggested he might have to release secret nuclear patents to the Canadian and British governments.

If Dr. Briggs does not see any objection I might apply for a secret patent in Canada and in England, which I would assign without financial compensation to the respective governments, but I shall, of course, refrain from doing this unless I hear from Dr. Briggs

that there would be no objection on his part or on the part of any other Government agency which is interested in this matter.⁴⁰⁹

Short of handing the patents over to these foreign governments, Szilard proposed that if he still was without “adequate government support,” he would seek foundational support from Rockefeller or Carnegie, and that he was not above releasing the patents to industry.⁴¹⁰ With his open willingness to disperse secret documents Szilard increased the pressure on the OSRD to act before they lost control of classified weapons research during wartime. Whether a direct result of Szilard’s gambit or not, the “Uranium Committee,” then under the direction of Bush and the National Defense Research Committee [NDRC], released \$40,000 on November 1st for Szilard to build a Uranium-Carbon reactor. Thereby, his various attempts to bargain with the U.S. government to pay attention to the threat posed by fission, to fund fission research, to pay attention to the world’s uranium supply, and to maintain strict secrecy helped engineer the first chain reaction—which took place a year later at the University of Chicago. Szilard’s wily and somewhat risky political interventions succeeded in the sense that he had negotiated a small amount of political traction as he brought about the meshing of scientific, military, and political goals that would coalesce as the Manhattan Engineering District in August, 1942.

However, Szilard’s later attempts to use his newfound political voice within the scheme of the Manhattan Project met with less success. Having already used his knowledge of fission as a political bargaining tool, he attempted to do the same with General Leslie A. Groves, military chief of the Manhattan Project, with patents derived from his work on reactor cooling systems. As historian Richard Rhodes wrote, “Szilard had believed he would have equal voice in fission development. Since he had now been compartmentalized [in the Chicago Metallurgical Laboratory], his freedom of speech restrained, his loyalty challenged, he was prepared to actuate the only leverage at hand, his legal right to his inventions.”⁴¹¹ The Manhattan Engineering

District maintained strict control over all patents, and General Groves locked out Szilard for most of 1943 as he annoyed his supervisors with endless quibbling about the status of his patents.⁴¹² Bush suspected Szilard of careerism, writing to Conant in January 1944, “I think Szilard is interested primarily in building a record on the basis of which to make a ‘stink’ after the war is over.”⁴¹³ After the war, Groves said Szilard was “the kind of man that any employer would have fired as a troublemaker,” and “What a pain in the neck that Szilard was!”⁴¹⁴

Regardless of the personal enmity he garnered from his strong-arm tactics, Szilard had used the rhetorical tactics of *realpolitik* to strike a bargain that would have world-historical consequences not only as it helped spur the Manhattan Project and thus Hiroshima and Nagasaki, but also as it inaugurated an era of nuclear deterrence, nuclear proliferation, and the ongoing threat of worldwide nuclear annihilation. In the face of so much looming disaster, Szilard turned to the collective wisdom of scientific “truth” to intervene in nuclear politics.

The Collective Scientific Voice

When science confronted the problems of the Bomb, Szilard argued that it should do so as a unified body, a body not only certain of its scientific truths, but a body certain of its political convictions. He argued that the formation of a unified scientific front could underwrite policy with the truth of science. Szilard sought to solve nuclear problems by throwing the massed weight of a large group of intellectuals behind his policy work. The U.S. government would have to reckon with a formidable dissenting “body” of scientific brains. Szilard’s pursuit of a collective scientific voice of truth in a nuclear age was rooted in both his experience in Europe and his experiences in the Manhattan Project. As early as 1930, Szilard had strategized that a collection of elite, youthful thinkers that he called the “Society of the Friends of the Bund”

should convene to steer the course of European politics toward democracy.⁴¹⁵ He thus envisioned that science was a key to political progress. Paradoxically, however, Szilard attempted to get scientists to use their scientific knowhow to dissent against the product of their scientific knowhow, to use their professional authority to demonstrate they may have been professionally mistaken to design the Bomb. Implicit in this paradox was a sense of scientific responsibility: the ones most responsible for creating the means of annihilation should be the ones to devise how to avoid annihilation. Szilard's plan thus seemed to embody technological paradox in the scientific collective.

In fact, the collective ethos of science became an issue in the Manhattan Project, where Szilard worried about the compartmentalization of research. In a February, 1944 memorandum sent to Vannevar Bush, Szilard complained that scientists could not “form a well-founded opinion and even if they individually arrive at definite opinions they are not able to put collective recommendations on record.”⁴¹⁶ In turn, “there can be no judgment on which the administration can base sound decisions.”⁴¹⁷ As individuals, scientists had little to offer, Szilard indicated. Rather, the “collective recommendations” of scientists were vital to any policy decisions. Such collective judgments were not just a matter of “truth;” they were a matter of power. As Szilard further wrote to Bush:

If there had been a mechanism for putting this collective opinion on record it would have been difficult for the authorities who were responsible for taking far-reaching decisions to make the mistakes which were made because those in authority would have been faced with the choice of following the collective recommendation of the scientists or taking the full responsibility of going against a practically unanimous recommendation.⁴¹⁸

The U.S. government, however, did not want “science” to function of as a voice of power. In fact, to protect power and assure the success of the Manhattan Project, General Groves mandated

the compartmentalization of scientific minds, leaving a vision of the whole “collective opinion” for a select few.

Szilard’s failure to influence the Manhattan Project administration to stop compartmentalizing research and information did not halt his attempts to harness the collective opinion of scientists to influence the deployment of the Bomb, however. As the Trinity test approached, Szilard moved from recommending collective action to organizing it. Szilard appealed straight to President Roosevelt. In a memorandum from March 25, 1945, Szilard constructed a collective voice for his colleagues in opposition to deploying an atomic bomb.⁴¹⁹ He wrote, “many of those scientists who are in a position to make allowances for future development of this field believe that we are at present moving along a road leading to the destruction of the strong position that the United States hitherto occupied in the world.”⁴²⁰ Instead of dropping the bomb, “science” recommended military restraint as the proper course. Szilard then described the exterministic scenario he wished to avoid. He wrote, “Under the conditions expected to prevail six years from now, most of our major cities might be completely destroyed in one single sudden attack and their populations might perish.”⁴²¹ The gravity of the situation should have, according to Szilard, given decision-making authority to the collective body of “men who have firsthand knowledge of the facts involved, that is, by the small group of scientists who are actively engaged in this work.”⁴²² By this logic, Szilard equated collective scientific knowledge with prudent political knowledge as the “true knowledge” of the Bomb. The nuclear physicists were singular people, advocating military restraint at a singular moment. Nobody else on the planet knew what they knew. According to Szilard, the U.S. government could assure its preservation in the face of speculative cataclysmic destruction only by heeding the collective recommendations of these physicists.

The day after the Trinity test, Szilard drafted “A Petition to the President of the United States.” Recollecting his impetus to write it Szilard said, “I thought that the time had come for the scientists to go on record against the use of the bomb against the cities of Japan on moral grounds.”⁴²³ To convince Truman of a moral case, he used some of the same appeals to rational scientific consensus that he had used in the Roosevelt memo. In the petition’s cover letter that exhorted fellow scientists to sign Szilard wrote, “I personally feel that it would be a matter of importance if a large number of scientists who have worked in this field went clearly and unmistakably on record as to their opposition on moral grounds to these bombs in the present phase of the war.”⁴²⁴ The moral claim, he suggested, was founded in scientific knowledge about “responsibility.” “The fact that the people of the United States are unaware of the choice which faces us increases our responsibility in this matter since those of us who have worked on ‘atomic power’ represent a sample of the population and they alone are in a position to form an opinion and declare their stand,” Szilard continued.⁴²⁵ Szilard therefore defined the role of nuclear physicists as one of unequaled moral importance that carried with it a huge burden of responsibility. The petition’s cover letter advanced an embodied synecdoche in which the scientists represented the whole of the U.S. population. If the average citizen had zero political agency to alter atomic bomb policy, especially amidst the ultra-secrecy of the Manhattan Project, then the few citizens and exiles who did know were beholden to pressure the government for restraint and lucid deliberation about future consequences. Szilard thus took it upon himself to “form an opinion” for “we the undersigned scientists” and their truth-centered, rational brainpower in order to act in their behalf. Only sixty-eight scientists signed.

When Truman authorized dropping Fat Man and Little Boy on Hiroshima and Nagasaki, power once again seemed to rebuff the voice of scientific truth. Szilard nevertheless remained

resolute that their collective opinion could influence future deployment. That politicians sometimes listened to Manhattan Project scientists and kept them “on tap” gave Szilard some hope.⁴²⁶ In the Cold War, Szilard gave up neither his efforts to stem the arms race, nor his efforts to unite a body of scientists to fight the unethical uses of atomic energy betwixt the threat nuclear war and promise of nuclear deterrence.

“A Melancholy Paradox:” Deterrence Theory and Szilard’s Atomic Bomb Talking

With the atomic bomb looming as what must have seemed an almost indomitable global force, deterrence theory ensconced the Paradox as official foreign policy for the nuclear superpowers. A holdover from criminal justice and WWI chemical warfare arguments, deterrence became a pervasive ideology with the development of the Bomb.⁴²⁷ Nuclear strategist and critic Herman Kahn defined deterrence as the creation of a “reliable balance of terror.”⁴²⁸ Albert Wohlstetter called it “a delicate balance of terror.”⁴²⁹ In Wohlstetter’s estimation, “If peace were founded firmly on mutual terror, and mutual terror on symmetrical nuclear capabilities, this would be, as Churchill has said, ‘a melancholy paradox;’ none the less a most comforting one.”⁴³⁰ “Deterrence” seeks to dissuade enemy attacks by promising annihilation as retribution, which, in theory, avoids war. Moreover, deterrence assumes that the more devastating the threat, the more powerful the deterrent; consequently, it can lead to weapons escalation. Deterrence relies on the same technology to simultaneously threaten humanity with annihilation and to preserve humanity from annihilation. Thus, political philosopher Gregory S. Kavka asserted that “Deterrence is a parent of paradox.”⁴³¹ I would suggest the opposite: paradox is a parent of deterrence.

Szilard speculated about deterrence even before the Trinity Shot, and his negative assessment of deterrence's viability was at the center of his apprehension about the effects of an atomic bomb. Szilard's advocacy for the atomic bomb—like that of a number of his scientific colleagues—was rooted in a concern about the intentions of Germany. He argued that the U.S. should rush to construct the Bomb to deter a catastrophic German offensive. "Nobody," he wrote in a May 26, 1942 letter to FDR's scientific advisor Vannevar Bush, "can tell now whether we shall be ready before German bombs wipe out American cities."⁴³² Nevertheless, Szilard never recommended using the atomic bomb on Germany or on any other enemy state. Rather, in keeping with deterrence, he envisioned that this most violent device might temper the extent of Germany's war effort.

Szilard held that atomic deterrence could work in the short term with respect to Germany, but he predicted that deterrence would fail to maintain peace in the long term. In subsequent 1942 correspondence to Bush (and other Project managers) he warned, "What the existence of these bombs will mean we all know. It will bring disaster upon the world even if we anticipate them and win the war, but lose the peace that will follow."⁴³³ "Losing the peace" would mean atomic annihilation, since, as Szilard asserted, a deterrent based on an atomic arsenal would do little to stop states from pursuing their own nuclear weapons program. With nuclear parity, Szilard envisioned, deterrence would not work to absolutely halt war when one belligerent could still wipe out another before they had a chance to respond in kind. The massively destructive force of the Bomb might deter certain acts of violence, but wars would still be fought.

Regardless of these grave reservations about the long-term prospects for a deterrent based on atomic arsenals, Szilard participated in the extremes of language that would be used by later nuclear deterrence advocates, whether under the aegis of "massive retaliation" in the 1950s or

mutual assured destruction (MAD) in the 1960s. He rhetorically amplified the Bomb's destructive power to the point that all people, civilization, and life on planet earth faced instant extinction.

Indeed, what would become the rhetoric of MAD brought all of humanity under its spectral mushroom clouds. Reflecting on the significance of each of its pivotal terms shows how this new form of "bomb talking" acted in tandem with technology to hold everyone hostage under a guise of force that seemed impossible to counter with either rhetoric or technology, which left only policy to preserve humanity. "Mutuality" indicated that nuclear powers agreed to acquiesce to the Bomb as the arbiter of foreign relations, and that they agreed that peace required them to threaten each other with catastrophe. "Assured" indicated that the agreement had attained a level of guaranteed inevitability and permanence among atomic powers. Stockpiles became the guarantor of the bargain. "Destruction" indicated the exigency that MAD sought to avoid, and thereby the policy adopted destruction as the primary stasis point to deliberate. In this way, MAD established the hyperbole of weapons rhetoric as official policy, such that MAD deterrence required "saturation parity," and eventually "overkill," a state of nuclear stalemate in which nuclear powers maintained an arsenal that could destroy the world's population many times over.

Well before anyone proposed MAD, Szilard's atomic bomb talking foreshadowed how the effects of failed deterrence would later be amplified in war discourse. *Civilization* was at stake, he argued in 1934, sounding like H. G. Wells: "The discoveries of scientists have given weapons to mankind which may destroy our present civilization if we do not succeed in avoiding further wars."⁴³⁴ Eight years later, with the world embroiled in war, he amplified the Bomb's destructive power as it got closer to completion. In a September, 1942 memo to Manhattan

Project personnel called “What Is Wrong with Us?” he described “a world in which a lone airplane could appear over a big city like Chicago, drop his bomb, and thereby destroy the city in a city in a single flash. Not one house may be left standing and the radioactive substances scattered by the bomb may make the area uninhabitable for some time to come.”⁴³⁵

In a 1945 memo for a meeting with President Truman’s soon-to-be secretary of state James Byrnes (the original draft of which he had written for FDR), Szilard argued for the global scope of the Bomb’s threat, the global scope of any measures to control it, and the ease with which enemy scientists could reproduce American results.

From now on the destructive power which can be accumulated by other countries as well as the United States can easily reach the level at which all the cities of the “enemy” can be destroyed in one single sudden attack. The expenditure in money and material which is necessary to reach this level is so small that any of the major powers can easily afford it provided they adopt “modern” production methods.⁴³⁶

The memo further claimed that if Russia obtained two tons of plutonium, it “would be sufficient to destroy all of our major cities in a single attack,” and “In case of war, all of our major cities might vanish within a few hours.”⁴³⁷ Szilard thus argued for the imperative of global controls on any and all atomic materials, controls that “would ultimately have to extend to every territory on earth.”⁴³⁸

In “A Petition to the President of the United States” that he drafted July 17, 1945 – the day after the Trinity explosion, Szilard reasserted the massive dangers of the Bomb. “The development of atomic power will provide the nations with new means of destruction,” he warned. “The atomic bombs at our disposal represent only the first step in this direction, and there is almost no limit to the destructive power which will become available in the course of their future development.”⁴³⁹ Even if the Trinity explosion at Alamogordo Air Force Base was huge, Szilard went further, envisioning an atomic future with “no limit,” one that would bring

“devastation on an unimaginable scale.”⁴⁴⁰ Again he argued for control, concluding, “If after the war a situation is allowed to develop in the world which permits rival powers to be in uncontrolled possession of these new means of destruction, the cities of the United States as well as the cities of other nations will be in continuous danger of sudden annihilation.”⁴⁴¹

Yet, these assertions about the Bomb’s ominous future comprised not only the logic that made deterrence theory persuasive, but also provided the terminology of nuclear proliferation. Ironically, while Szilard warned policy makers against nuclear weapons, his exterministic language made the case for deterrence and proliferation by corroborating the magnitude of destruction promised by those who praised the power of the Bomb. The scale of destruction promised in words amplified the material stakes of violence. If every government possessed civilization-smashing weaponry, none would attack. The Bomb’s horribleness seemed like its most preservative function.

Such amplification brought Szilard squarely before the paradoxes of bomb talking. The preservation of civilization necessitated the ability to destroy it. Despite some umbrage, by Herman Kahn and others, that the hyperbolic magnitude of Bomb rhetoric did not match the magnitude of actual destruction the weapon could wreak, language like Szilard’s became the norm for atomic bomb talking.⁴⁴² Descriptions of “large-scale extermination” and “sudden annihilation,” as Szilard wrote to his Metallurgical Laboratory colleagues in September 1945, soon became banal.⁴⁴³ Instead of dissuading his readers with these catastrophic scenarios, he offered policy makers and the military a compelling language by which to argue for the importance of nuclear weapons. Thus, as an early participant in nuclear discourse, Szilard paradoxically helped frame a nuclear strategy he would oppose. His subsequent letters and memos, in an era of foreign policy marked by the dominance of deterrence, represented a type of

historical, political, and technological damage control as he attempted, with varied success, to remain a relevant voice.

The Pragmatic Idealism of Szilard's Model of Communication

While Szilard pursued the goals of saving the world and making it more livable too, the grandeur of these goals entailed working toward them in small incremental steps. He advanced scientist-by-scientist, politician-by-politician, and policy-by-policy toward nuclear arms control, then reduction, then elimination. The rhetorical tactics that Szilard used to control nuclear information – appealing to a disinterested scientific ethos, impassioned political bargaining, and appealing to a unified scientific voice – were calculated according to the practical push and pull of negotiating the probabilities of atomic annihilation and atomic peace.⁴⁴⁴ For this reason, his everyday language displayed a tactical pragmatism that he exercised in the long and unfinished quest for peace. Thereby his rhetoric operated according to a logic of “pragmatic idealism” that empowered Szilard to be paradoxical – to simultaneously argue for and against atomic bombs. Szilard never wrote of pragmatic idealism, but his friend and colleague Jonas Salk identified its presence in Szilard's work. Salk reflected, “In his special ways, through a quest for knowledge and through the force of his pragmatic idealism, he sought to create a more peaceful world.”⁴⁴⁵

Pragmatic idealism made Szilard's bomb talking sound reasonable as he entered the manipulative world of political rhetoric where his scientific principles might not find traction. If one rhetorical tactic failed, he could pragmatically jettison it to pursue another tactic without undermining the final goal. I suggest that the logic of pragmatic idealism offered a rhetorical mode to negotiate the paradoxes of technology, not only to Szilard, but to other rhetors who confront technology that could both annihilate humanity or preserve it from annihilation.

Pragmatic idealism offers a way of thinking that keeps the polarized extremes of total extermination and permanent peace in mind without hampering day-to-day affairs. Szilard indicated this logical tendency in his work by conceiving an idealized concept of scientific language that functioned as a counterpart to pragmatic political language. With two realms of language conceptually opposed, Szilard formed an overarching rhetorical strategy that bridged the idealism of scientific communication with the pragmatism of political communication.

Two philosophers writing in different millennia about how practical rhetoric interacts with lofty goals, Aristotle and Nicholas Rescher, help elucidate Szilard's communication model. Aristotle synthesized the squabbling of Plato and Gorgias over the definition of rhetoric by defining it as the counterpart of philosophical dialectic, which brought pragmatics and ideals into the same realm of activity. Further, Aristotle defined *phronēsis* as the action of a prudent individual who identifies the available means of persuasion as an act of creating a better world based on a lofty ideal.⁴⁴⁶ A prudent individual must balance the reasonable with the desirable, and the desirable with the practical.⁴⁴⁷ Many centuries later, Rescher named and began publishing a systematic description of pragmatic idealism as a philosophical school in 1992.⁴⁴⁸ To describe how the usually differentiated concepts of pragmatism and idealism mingle Rescher wrote, "insofar as realism stands on [a] pragmatic basis, it does not rest on considerations of independent substantiating evidence about how things actually stand in the world, but rather it is established by considering, as a matter of practical reasoning, how we do (and must) think about the world within the context of the projects to which we stand committed."⁴⁴⁹ This type of idealism derives from method and not substance, and thereby "facilitates acceptance" of objects within the context of ideal principles. Rescher did not intend to equivocate "realism" with "idealism," but he did argue that these discrete epistemological and political concepts overlap by

informing each other's development in practice. Szilard, for instance, held the conviction that his prudent actions bettered humanity both when he spurred nuclear research and sought to abolish its dangerous products, but he dissociated, to an extent, his ideals from his many attempts at policy intervention to make his arguments appear more realistic. Szilard never would have abandoned his ideals, while he did abandon rhetorical tactics when the argument warranted doing so. To paraphrase Aristotle and Rescher, Szilard's rhetoric prudently pursued manufacturing a weapon capable of wreaking annihilation as a pragmatic way to achieve the desirable goal of world peace. He, as a matter of practical reasoning, rhetorically intervened in a political realm bent on implementing foreign policy based on exterminism as a means to attain his commitment to disarmament. Szilard's pragmatic idealism was thus paradoxical. It allowed him to work toward producing the atomic bomb *and* work toward abolishing the weapon.

Szilard's model of communication clarified the ideal way he intended to use language to pursue "a more livable world," or in other words, how he would pragmatically work toward peace. The model of communication appeared in Szilard's personal "10 Commandments," which his literary executors claimed "reflect Szilard's spirit like a portrait," making it vital to an understanding of his rhetoric.⁴⁵⁰ The third commandment exhorted, "Speak to all men as you do to yourself, with no concern for the effect you make, so that you do not shut them out from your world: lest in isolation the meaning of life slips out of sight and you lose the belief in the perfection of creation."⁴⁵¹ For someone who helped create the Bomb, Szilard's attitude about communication was dangerous. As an anti-rhetorical stance that rejected the importance of "effects," he rejected the ramifications of the words he used to spur Bomb research. Once a scientist resorts to persuasion, he argued, he or she abandons truth for manipulation of effects, and loses anti-rhetorical superiority.

Szilard did not really live according to this third commandment, because it referred to scientific communication, which he dissociated from political communication. This dissociation meant he could be quite concerned with the “effects” of political language without breaking his life philosophy.⁴⁵² According to Szilard’s argument, politics can evade truth, and science can evade rhetorical effect.⁴⁵³ When politics enters the realm of science and science the realm of politics, science gets debased as truth becomes obscured by unsavory motivations. His voluminous political advocacy intervening in weapons and war policies belied his beliefs that scientists have little power and that he should ignore the “effect he made” when speaking about what he considered the truth. When science and politics collided, neither political rhetoric nor scientific clarity could devise the best policies in isolation from each other.

Szilard clarified his dissociation of scientific and political communication in the short story “The Voice of the Dolphins.” Regarding his efforts at arms control, he concluded that scientists would have a greater chance of solving the problem than politicians. According to Szilard, “when a scientist says something, his colleagues must ask themselves only whether it is true.”⁴⁵⁴ Furthermore, “Scientists rarely think that they are in full possession of the truth, and a scientist’s aim in a discussion with his colleagues is not to persuade but to clarify. It was clarification rather than persuasion that was needed in the past to arrive at the solution of the great scientific problems.”⁴⁵⁵ In this view of scientific communication, the only questions that arise are ones of truth and falsity, so communication consists of describing and conveying the results of research. Truth and science have neither political motives, nor persuasive purposes and “effects,” while rhetrickery infuses politics.⁴⁵⁶

Szilard’s model of communication somewhat resembled G. Thomas Goodnight’s description of the personal, technical, and public spheres.⁴⁵⁷ But whereas Goodnight argued that

the different spheres merge with each other and get co-opted as arguments and debates develop, Szilard resisted the idea that the technical speech of nuclear scientists could blend with the speech of wartime politicians and still retain any integrity. Scientists, according to Szilard's rather Platonic conception of rhetoric, should avoid manipulating language for political purposes, because he asserted that if scientists used political language, they would degrade the truth of their research. Effects could be ignored, Szilard argued, because as a scientist, the only way other scientists would pay attention to him was if he spoke truth. To settle a scientific disagreement open and clear communication of information was key, and therefore the scientific model was preferable.⁴⁵⁸

Thus the main difference between politicians and scientists hinged on their differing regard for the truth in communication. In contrast to scientific communication, Szilard asserted that in the political realm, "when a politician says something, his colleagues must first ask, 'Why does he say it?'; later on they may or may not get around to asking whether it happens to be true."⁴⁵⁹ Szilard defined a politician as "a man who thinks he is in possession of the truth and knows what needs to be done; thus his only problem is to persuade people to do what needs to be done."⁴⁶⁰ Szilard thus recognized that both politicians and scientists needed to rely on each other to devise atomic policy at a time when many politicians viewed outspoken scientists as meddlers.

Rather than abandon the fate of the world to politicians, Szilard attempted to import the truthful language of science into politics as a pragmatic way to fuse the truth of fission to political gambits for domestic and international power. Hence, Szilard's communication model had import for his scientific intervention into nuclear policy as he sought to influence policymakers to adopt a more scientific mindset and a more scientific type of communication. If the different spheres of intellectual activity required different types of communication, then

when they met, it would entail different means to understanding, argumentation, and persuasion in order to deliberate. Szilard's political interventions were therefore a type of rhetorical information control that attempted to bridge communication between scientists and politicians, and this bridge entailed rhetorical invention that would bring the two models into alignment when they, by necessity, had to interact. He needed to control the dangerous information in order to accomplish his varied goals of building bombs, keeping the science secret, and then abolishing it. Thereby, his language was partly based in the pragmatic engagement with politics and partly based in the ideal truth revealed by science.

For Szilard "the facts" of atomic fission provided a way to negotiate the conflict between political rhetoric and scientific truth.⁴⁶¹ In a 1943 conversation with Hans Bethe, Szilard recalled saying, "I am going to write down all that is going on these days in the [Manhattan] project. I am just going to write down the facts—not for anyone to read, just for God." When Bethe asked "Don't you think God knows the facts?" Szilard replied, "Maybe he does...but not *this* version of the facts."⁴⁶² Szilard recognized that in the political sphere, he could rearrange facts in myriad ways to present the competing political arguments without losing sight of the scientific principles that undergirded nuclear fission. Scientific facts and political facts did not match each other, but rather than being a constraint, the flexibility of evidence empowered both his pragmatism and idealism as he attempted to get the government to pay attention to his policy ideas. His self-proclaimed "addiction to the truth" should therefore not be confused with an addiction to factualness. Controlling how his correspondents interpreted "the facts" thus became a primary concern of Szilard's interventions in nuclear policy. Aligning the facts of nuclear research, international political goals, and weapons deployment could serve both the truth of fission and amelioration of its devastating power

Thus, Szilard argued that political language should become more scientific in order to avoid nuclear war. In “The Voice of the Dolphins” Szilard wrote about politicians who believed that “scientists should be on tap but not on top.” This dictum meant that “scientists must not concern themselves with devising and proposing policies; they ought to limit themselves to answering such technical questions as they may be asked. Thus, it may well be that the scientists gave the wrong answers because they were asked the wrong questions.”⁴⁶³ This attitude indicated to Szilard that politicians failed to understand the Bomb’s technical problems and therefore failed to grasp its political ramifications.⁴⁶⁴ Szilard claimed that political solutions would become apparent faster if politicians abandoned their exclusion of scientists from policy making to learn more about atomic bombs, and if they followed a scientific model of communication. He wrote that, “scientific problems had been solved with amazing rapidity because they had been constantly exposed to discussion among scientists, and thus it appeared reasonable to expect that the solution of political problems could be greatly speeded up also if they were subjected to the *same kind* of discussion.”⁴⁶⁵ Thus, politicians should aim for clarification rather than persuasion. Szilard told an audience, gathered to honor *The Nation* magazine in December 1945, that by aiming for clarification of the truth, politics could approach science in its quest for the impossible. Szilard said, “The crisis which is upon us may not find its ultimate solution until the statesmen catch up with the scientists and politics, too, becomes [like science] the art of the impossible.”⁴⁶⁶ While the Bomb had been an impossible sci-fi prediction, scientists found a way to materialize it. The new impossible task was avoiding annihilation. Remaining ignorant of the Bomb’s social, cultural, and political ramifications that scientists like Szilard predicted would not solve the problems that the weapon appeared destined to cause.

After the Bomb, confronted with the sudden dominance of deterrence theory and nuclear proliferation in military and political policy, Szilard's pragmatic idealism manifested during the Cold War as a moderate argument for "minimal deterrence" that met arms race advocates and abolitionists half way. His advocacy of minimal deterrence exemplified how his communication model functioned according to pragmatic idealism. Minimal, or minimum, deterrence holds that only a few bombs are necessary to deter enemy aggression.⁴⁶⁷ A median point between abolishment and overkill, it broke his ideal conception of a peaceful world because the strategy still relied on using the weapons he wanted to abolish. Although minimal deterrence looked like a defeat of his quest to abolish the Bomb, it was Szilard's best effort at political cunning, a pragmatic, incremental step toward the goal.⁴⁶⁸ It was damage control for nuclear proliferation. Szilard's version of the policy recommended both that the U.S. and U.S.S.R. should mine about a dozen of each other's cities to enable minimum level retaliation in the event of war, and that each state's citizens should perform rigorous public inspections of each other's weapons programs. His most famous iterations of the minimal deterrent argument appeared in fiction as "The Voice of the Dolphins" and "The Mined Cities" wherein about a dozen bombs provided "insurance" in the event of enemy hostility.⁴⁶⁹ Not only would such Bombs provide retaliatory insurance, but their continued existence would make sure that fear would dictate that policy decisions would be rational rather than rash. Fear should force decision makers to use restraint and caution. Szilard's begrudging advocacy of minimal deterrence became more prominent in his writings as prospects for abolition declined in the 1950s and early 1960s. Minimal deterrence did not make arms control impossible and in contrast to the careening arms race, reducing nuclear stockpiles to small arsenals did appear like a significant step toward eliminating them in the long term.

Thus, minimal deterrence contradicted his ideal goal of eliminating nuclear weapons, while it empowered his negotiations with Bomb-struck politicians. The argument for minimal deterrence ideally worked toward peace and pragmatically legitimated the weapon. Like the concept of WMD deterrence in general, the strategy was therefore paradoxical in the way it relied on the means to exterminate large populations to guarantee that those same populations would not get exterminated. Szilard just called for restraint and fewer atomic bombs to complete the task of deterring global war than those who advocated massive nuclear escalation and proliferation. In a sense, pragmatic idealism worked as a “failsafe” – it empowered entente without abandoning disarmament. If one tactic failed, the ideal was still safe, but new tactics needed invention in order to attain it. In the face of the overwhelming catastrophic destruction wrought in WWII and the 20th century, Szilard understood that no lone rhetorical tactic would end humanity’s reliance on atomic bombs. Therefore, a pragmatic idealism accorded Szilard the ability to pick and choose how best to negotiate the Malthusian Paradox.

Conclusion

Szilard did not succeed in convincing Truman to refrain from bombing Japan. But the first atomic blasts still served a pragmatic purpose within Szilard’s desire for world peace. Szilard asserted that a demonstration of the Bomb’s destructive capacity would rally public support of lasting peace by embedding a powerful sense of dread and foreboding into people’s minds. In a January, 1944 letter to Vannevar Bush Szilard wrote, “If peace is organized before it has penetrated the public’s mind that the potentialities of atomic bombs are a reality, it will be impossible to have a peace based on reality.”⁴⁷⁰ Szilard waffled in 1944 and 1945 about whether the U.S. should destroy a populated or pre-depopulated city, but Bush ended up concurring that a

destructive demonstration was necessary to scare people into political pragmatism.⁴⁷¹ Only by fearing the atom could citizens and politicians best choose how to control it. He wrote, “it will hardly be possible to get political action along that line unless high efficiency atomic bombs have actually been used in this war and the fact of their destructive power has deeply penetrated the mind of the public.”⁴⁷² Irrespective of whether deterrence would succeed in the short or long term, fear would dominate policymaking. The peace, though, would not last long according to Szilard, and the nuclear powers continued to skirmish and battle. The terror, though, lasted a bit longer than peace.

The first three atomic bombs—exploded at Alamogordo, Hiroshima, and Nagasaki—presented humanity with a weapon to worry about. Anxiety about the bomb proliferated. People reported a rupture of perception that had to be surmounted. The Trinity test stunned its witnesses and seemed to make all other weapons obsolete. In the words of General Thomas F. Farrell, witness to the Trinity blast, “All seemed to feel that they had been present at the birth of a new age—the Age of Atomic Energy—and felt their profound responsibility to help in guiding into right channels the tremendous forces which had been unlocked for the first time in history.”⁴⁷³ Farrell was just one person of countless numbers who proclaimed the birth of a new era – “the atomic age.” *Life* magazine, for instance, stated that “Aug. 5, 1945 is the day men formally began a new epoch in their history.”⁴⁷⁴ Elsewhere, the same issue of *Life* declared, “In a fraction of a second on Aug. 5, 1945 American scientists not only destroyed Hiroshima, Japan, but with it many human concepts—chief among them our ideas of how to wage war,” and “what is to come transcends all man’s experience of what has gone before.”⁴⁷⁵ Szilard also placed great historical importance on nuclear physics, stating that Joliot’s discovery of neutrons “changed the course of history.”⁴⁷⁶ Even though it did not cause the majority of the war’s casualties and fatalities, the

Bomb provided the exclamation point to the conflict. The lasting impression left by the Bomb made the weapon seem deterministic of almost all aspects of subsequent life.

The weapon seemed to obtain more influence as a symbol than its actual limited deployment as a weapon would seem to permit. That one bomb produced so much power and so much destruction amazed everybody to the point of saturating culture. As a ubiquitous symbol, politicians could rhetorically “drop the bomb” as a commonplace symbol of Cold War politics. Thus, post-Bomb weapons rhetoric remained relatively static, adapting to the new weapon but exhibiting the same paradoxical traits of older versions of bomb talking. Regarding the Bomb’s iconicity, its apparent singularity is not rhetorical, not political, and not deterministic. Nuclear weapons rhetoric draws from and resembles the history of weapons rhetoric; the ultimate weapon has not produced peace through deterrence; and it shares technological “power” to impact and motivate people with devices that have much more presence to people’s everyday lives than the remote silos and submarines that store nuclear stockpiles.

Later bomb talkers, like President Eisenhower, could appropriate well-established paradoxical arguments for retaining and increasing a nuclear arsenal in the name of peace. And if Szilard’s quest for peace represented a minority opinion during WWII, that stance shifted as the Cold War ensued and it became official, if not actual, policy to use the weapon for peace rather than destruction. In the early Cold War, atoms were for peace, not war. Whereas Szilard desired to achieve peace through abolition, or at least reduction, and a real desire for disarmament, Eisenhower desired peace through escalation and threat and a false appeal to disarmament hopes. In both policy ideas the same paradoxical rhetoric of mass disaster mitigated the ideal of peace. According to Ned O’Gorman, “Eisenhower cast the nation on a mission for world peace even as he and others in his administration spoke of massive nuclear retaliation, added substantially to

the U.S. inventory of thermonuclear warheads, and introduced the nuclear ballistic missile to the nation's arsenal."⁴⁷⁷ And as Martin J. Medhurst noted, although Eisenhower's "Atoms for Peace" speech had explicit references to disarmament, that step toward atomic peace functioned as a psychological ruse.⁴⁷⁸ Thus Eisenhower's policy further entrenched the ideology of deterrence and reiterated the Paradox anew: atomic peace meant enduring the permanent threat of atomic annihilation to avoid atomic annihilation.

The atomic bomb's symbolic power has, perhaps, faded somewhat, replaced by new weapons and new threats. And despite the Bomb's usefulness as a military, political, and cultural symbol, it did not alter the world as much as hyperbole suggested. Regarding the effect of the Bomb on politics, French social historian Raymond Aron argued that the Bomb did not cause any substantive change in international relations.⁴⁷⁹ It was just another weapon, a more powerful weapon to be sure, but just a weapon. During the Cold War states operated much as they had before Hiroshima. States did not cease to conduct their wars by other non-nuclear means. As such, the political significance of the Bomb was overstated in its capacity to wage destruction, win wars, or prevent wars, even as a monolith of foreign relations. The atomic bomb resembles most weapons in its purpose, if not their magnitude of destruction. In Chicago, a hand gun threatens death and chaos to high school students more so than a terrorist's improvised dirty bomb, much less a Soviet-era ICBM. The "facts" of atomic bombs and all other weapons can get rearranged to tell a variety of paradoxical narratives about people's future.

³⁸⁵ Szilard, *His Version of the Facts*, vi.

³⁸⁶ Biographical details come from Szilard's reminiscences in *His Version of the Facts* and Lanouette's biography of Szilard, *Genius in the Shadows*.

³⁸⁷ Wells, *The World Set Free*, 80.

³⁸⁸ Wells, *The World Set Free*, 80.

³⁸⁹ Szilard, *His Version of the Facts*, 17.

³⁹⁰ Szilard, *His Version of the Facts*, 94-96. Many of the proposals for how to organize research into atomic energy that he outlined in a August, 1940 memorandum to Alexander Sachs were realized as the Manhattan Engineering District took shape. Szilard, *His Version of the Facts*, 137-139. Not all atomic historians share the belief that

Szilard's prodding influenced the U.S.'s pursuit of the Bomb, because as a foreigner, the Briggs Committee excluded Szilard to an extent. See Bundy, *Danger and Survival*, 36.

³⁹¹ The 'Metallurgical Laboratory' was "a code name chosen to conceal the nature of the work being done there." Groves, *Now It Can Be Told*, 9.

³⁹² Quoted in Lanouette, *Genius in the Shadows*, 308 and in Brodie and Brodie, *From Crossbow to H-Bomb*, 253. According to the "Notes of the Interim Committee Meeting, May 31, 1945," Groves already had plans to jettison and suppress scientists who lacked discretion and loyalty. Reproduced in Sherwin, *A World Destroyed*, 302.

³⁹³ Szilard helped Byron Miller and Edward Levi to draft the bill. Szilard had lobbied and testified before congress to help defeat the May-Johnson Bill that would have granted control of nuclear energy to the U.S. military.

³⁹⁴ Szilard, *His Version of the Facts*, xvii.

³⁹⁵ His literary executors explained his conflicted motivations: "he pressed the Americans to make nuclear weapons before Nazi Germany did; he was then among the first to fight against the actual use of the bombs he had done much to create." Spencer R. Wear's and Gertrude Weiss Szilard's "Preface" to Szilard, *His Version of the Facts*, xvii. Journalist Edward R. Murrow made a similar assertion: his work on the Bomb "has left him with one driving purpose, and that is to try to help dismantle the era of terror he helped to create." Quoted in Lanouette, *Genius in the Shadows*, 411. Michael Bess, in his study of Szilard's and others' peace-making strategies wrote "that weapons have become powerful enough to threaten the entire biosphere... is a dilemma that humankind has yet to resolve in any satisfactory way: how to secure the peace, without risking collective suicide, in a world of such fearsome armaments and belligerent ideologies" *Realism, Utopia, and the Mushroom Cloud*, xv. Regarding Szilard's paradoxical career, Bess wrote: "Implicit in Szilard's statement [that solving technological problems first requires solving 'the problems of human behavior'] was a paradox lying at the heart of industrial civilization: while human mastery over nature steadily increases, humanity's control over its own destiny becomes more and more problematic" (53). Bess also named paradox as the motivator of Szilard's science: "Like Einstein and Bohr, Szilard tended to approach scientific questions with an eye to their bearing on the fundamental mysteries of nature; he was actually more at ease with those answers that bordered on mathematical or metaphysical paradox than with straightforward, one-dimensional models projecting mechanical laws" (56). Szilard, of course, was not the only person who displayed these paradoxical tendencies, because as I have argued, the Paradox confronts all weapons rhetors. Sherwin's *A World Destroyed* examines the work of "atomic scientists who sought to save the new world while creating the means of destroying the old" as some of the book's "principal subjects" (3). Martin J. Medhurst has, for example, argued that Eisenhower's "Atoms for Peace" speech "confronted his audience with the paradox of a warrior who hates to speak of war, thereby distinguishing the persona of the General from that of the statesman. The General spoke the language of war; the President speaks the language of peace." Medhurst, "Eisenhower's 'Atoms for Peace,'" 209.

³⁹⁶ According her "Preface" to his *Scientific Papers*, Gertrude Weiss Szilard, Szilard's wife and literary executor, stated that Szilard "had a sense of history... and carefully preserved all notebooks, correspondence, and drafts of his writings and even filed documents of special importance in folders marked "History" (xix). Physicist Hans Bethe accused Szilard of paradoxical thinking, stating that his "ideas often were expressed in paradoxes, and the paradoxes were not always understood." Quoted in Lanouette, *Genius in the Shadows*, xix. Lanouette wrote that "Paradoxes fascinated Szilard because he considered them clues to defects in our understanding of the world." (*Genius in the Shadows*, 384).

³⁹⁷ According to Szilard's friend Edward Shils, Szilard spoke of "everything," including east European foodstuffs, in a "disinterested and precise way." "Leo Szilard: A Memoir," 37.

³⁹⁸ Szilard, *His Version of the Facts*, 47.

³⁹⁹ Throughout the late 1930s, Szilard pressed other nuclear scientists to suppress their fission research in light of atomic weaponry.

⁴⁰⁰ Quoted in Lanouette, *Genius in the Shadows*, 158.

⁴⁰¹ Szilard, *His Version of the Facts*, 46.

⁴⁰² Szilard, *His Version of the Facts*, 47.

⁴⁰³ Szilard, *His Version of the Facts*, 136. In May 30, 1940 correspondence with physicists Louis A. Turner and Harold C. Urey, Szilard proposed that "free discussion of all result and ideas among as many physicists as is practicable should not be inhibited" and that all participants be "trustworthy" and pledge to withhold information from everyone else (128 and 130). Physicist Louis A. Turner, among others like his oft-partner Enrico Fermi and French physicist Frédéric Joliot, did not comply with Szilard's plan. In somewhat remarkable fashion, Szilard expressed incredulity about his colleagues claims that nuclear fission had already gained international fame when he was the one responsible for disseminating documents throughout Europe and the U.S. Szilard had mailed

“dangerous manuscripts” around the world, yet he wanted to keep the information from nefarious abusers of the science. See Szilard, *His Version of the Facts*, 57, 69-70, and 77.

⁴⁰⁴ Szilard, *His Version of the Facts*, 118.

⁴⁰⁵ Szilard, *His Version of the Facts*, 115.

⁴⁰⁶ Szilard, *His Version of the Facts*, 121.

⁴⁰⁷ Germany had already seized Czechoslovakian uranium mines and could take over large deposits in the Belgian Congo if and when Germany invaded Belgium.

⁴⁰⁸ Szilard, *His Version of the Facts*, 141.

⁴⁰⁹ Szilard, *His Version of the Facts*, 140.

⁴¹⁰ Szilard, *His Version of the Facts*, 141.

⁴¹¹ Rhodes, *The Making of the Atomic Bomb*, 504.

⁴¹² Szilard, *His Version of the Facts*, 163. For an overview of the Project’s system of controlling patents under the direction of Captain R. A. Lavender, USN, Retired, see Groves, *Now It Can Be Told*, 418-420.

⁴¹³ Quoted in Sherwin, *A World Destroyed*, 117.

⁴¹⁴ Quoted in Rhodes, *The Making of the Atomic Bomb*, 502, and quoted in Sherwin, *A World Destroyed*, 116-117.

⁴¹⁵ As the editors of *His Version of the Facts* noted, the Bund represented the first of many such endeavors, including his much later, and more successful, work helping to organize the “Pugwash Movement,” “The Emergency Committee of Atomic Scientists,” and the “Council for a Livable World,” as well as other abortive endeavors like the “Angels Project” that Szilard proposed in 1962 to bring together U.S. and Soviet policymakers to stop the arms race. Szilard, *His Version of the Facts*, 22.

⁴¹⁶ Szilard, *His Version of the Facts*, 164.

⁴¹⁷ Szilard, *His Version of the Facts*, 164.

⁴¹⁸ Szilard, *His Version of the Facts*, 176.

⁴¹⁹ After Roosevelt’s death, Szilard revised the memo for his meeting with James Byrnes.

⁴²⁰ Szilard, *His Version of the Facts*, 206.

⁴²¹ Szilard, *His Version of the Facts*, 206.

⁴²² Szilard, *His Version of the Facts*, 206.

⁴²³ Szilard, *His Version of the Facts*, 187.

⁴²⁴ Szilard, *His Version of the Facts*, 210.

⁴²⁵ Szilard, *His Version of the Facts*, 210.

⁴²⁶ Szilard, *His Version of the Facts*, 213 and 224.

⁴²⁷ According to deterrence scholar Lawrence Freedman, “Deterrence can be a technique, a doctrine and a state of mind” (*Deterrence*, 116).

⁴²⁸ Kahn, “The Nature and Feasibility of War and Deterrence,” 28.

⁴²⁹ Wohlstetter, “A Delicate Balance of Terror.”

⁴³⁰ Wohlstetter, “A Delicate Balance of Terror,” 212. Wohlstetter attempts to dispel faith in the myth of deterrence, while also stating that the superpowers cannot abandon deterrence. He concludes: “What can we say then, in sum, of the balance of terror theory of automatic deterrence? It is a contribution to the rhetoric rather than the logic of war in the thermonuclear age” (234). I aver that deterrence is more than rhetoric and logic, but a pervasive Cold War ideology.

⁴³¹ Kavka, *Moral Paradoxes of Nuclear Deterrence*, 15.

⁴³² Szilard, *His Version of the Facts*, 152.

⁴³³ Szilard, *His Version of the Facts*, 154. Szilard, perhaps, expressed a war cliché. In a diary entry written from Versailles in March, 1919 Harold Nicolson wrote: “It will be too awful if, after winning the war we are to lose the peace.” Quoted in Johnson and MacLeod, “The War the Victors Lost,” 221.

⁴³⁴ Szilard, *His Version of the Facts*, 37.

⁴³⁵ Szilard, *His Version of the Facts*, 95, 125, and 154.

⁴³⁶ Szilard, *His Version of the Facts*, 198.

⁴³⁷ Szilard, *His Version of the Facts*, 197. The concentration of the U.S.’s population in cities, Szilard argued, made the country an even easier target for destruction because fewer bombs could do more damage than American bombs could do to Russia’s more sparse population centers.

⁴³⁸ Szilard, *His Version of the Facts*, 198. Reflecting on the Bomb’s creation in November 1945 and using similar commonplaces of weapons rhetoric, Oppenheimer noted that soon the weapon would be “very cheap” for anyone with the motivation to make it, and that they will “be universal if people wish to make them universal.”

“Oppenheimer’s Speech to Los Alamos Scientists,” reproduced in Kelly, *The Manhattan Project*, 370.

- ⁴³⁹ Szilard, *His Version of the Facts*, 211.
- ⁴⁴⁰ Szilard, *His Version of the Facts*, 211.
- ⁴⁴¹ Szilard, *His Version of the Facts*, 211.
- ⁴⁴² Kahn, *On Thermonuclear War*, 9.
- ⁴⁴³ Quoted in Lanouette, *Genius in the Shadows*, 278.
- ⁴⁴⁴ Ned O’Gorman argued that Eisenhower’s “rhetorical structure is intimately related to [his] political philosophy, his practical concerns, his political anxieties, and to the very real problem of the Bomb.” “Eisenhower and the American Sublime,” 46.
- ⁴⁴⁵ From Salk’s introduction to Lanouette, *Genius in the Shadows*, xiii.
- ⁴⁴⁶ Aristotle, *On Rhetoric*, 36 (1355a).
- ⁴⁴⁷ Self, “Rhetoric and Phronesis,” 134. Lois S. Self noted the inseparability of rhetoric and *phronēsis* in Aristotle’s work, and argued that Aristotelian rhetoric and “practical wisdom” must be understood together for multiple reasons: the similarities in Aristotle’s descriptions of the two terms, Aristotle’s idea that excellence in rhetoric requires practical wisdom, Aristotle’s statement that the study of rhetoric branches from both dialectic and ethics, and “the desirable relationship of the man of practical wisdom to the public closely parallels the relationship Aristotle posits between the rhetor and the audience in the *Rhetoric*” (“Rhetoric and Phronesis,” 131). Or as Danielle Allen puts it, “The point is to display to an audience that one’s habitual thought processes lead to pragmatically successful endeavors” (*Talking to Strangers*, 145). This conception of political action became the basis of subsequent rhetorical theory starting with at least Isocrates to influence contemporary rhetoricians like Allen. Phillip Sipiora wrote that, “Isocrates postulates a symbiotic relationship between *phronesis* and effective discourse. Rhetoric cannot be successful without their conjunction and Isocrates’ entire educational program is predicated upon the notion that rhetoric and practical wisdom are interdependent” (“Introduction,” 9).
- ⁴⁴⁸ Rescher, *A System of Pragmatic Idealism*, 3 vols.
- ⁴⁴⁹ Rescher, “Pragmatic Idealism and Metaphysical Realism,” 397.
- ⁴⁵⁰ Szilard, *His Version of the Facts*, xviii
- ⁴⁵¹ Szilard, *His Version of the Facts*, vi.
- ⁴⁵² Other politicians and their advisors, like President Kennedy’s security adviser McGeorge Bundy, also believed in the separation of science and politics into discrete spheres of activity and bristled at the attempts of scientists to intervene in nuclear policy. Bundy, *Danger and Survival*, 46 and 89.
- ⁴⁵³ According to Szilard, he had always considered science and politics separate realms. In a 1953 speech at Brandeis University he said, “When I was a young boy, I had two great interests in life; one was physics and the other politics. I kept these two interests in two compartments, and it never occurred to me that these two compartments could ever merge into one. To my interest in politics, I probably owe my life; and to my interest in physics, I owe my livelihood.” Quoted in Gertrude Weiss Szilard’s “Preface” to Szilard, *Scientific Papers*, xix.
- ⁴⁵⁴ Szilard, *The Voice of the Dolphins*, 53.
- ⁴⁵⁵ Szilard, *The Voice of the Dolphins*, 54.
- ⁴⁵⁶ Lanouette reported that according to Szilard, “Besides being more clever than congressmen...scientists should lead his movement because—unlike politicians—they have ‘integrity and purity.’” And when asked about his Council for a Livable World’s lobbying of the Senate, Szilard said, “Because there are fewer of them, and they’re easier to buy.” Lanouette, *Genius in the Shadows*, 450 and 454.
- ⁴⁵⁷ Goodnight, “The Personal, Technical, and Public Spheres of Argument.”
- ⁴⁵⁸ Bess writes that, “At the heart of Szilard’s thinking, in these short-term proposals for stabilizing the arms race, just as in his long-range hopes for disarmament, lay the goal of enhancing communication between” the U.S. and the U.S.S.R. *Realism, Utopia, and the Mushroom Cloud*, 69.
- ⁴⁵⁹ Szilard, *The Voice of the Dolphins*, 54.
- ⁴⁶⁰ Szilard, *The Voice of the Dolphins*, 54.
- ⁴⁶¹ Szilard, *His Version of the Facts*, 3. In Szilard’s fictional “My Trial as a War Criminal,” his main line of defense was telling the truth. Szilard, *The Voice of the Dolphins*, 106.
- ⁴⁶² Szilard, *His Version of the Facts*, 149, emphasis his. The editors of *His Version of the Facts* cite this reminiscence as the reason for their titling of the book.
- ⁴⁶³ Szilard, *The Voice of the Dolphins*, 48.
- ⁴⁶⁴ Szilard, *The Voice of the Dolphins*, 48.
- ⁴⁶⁵ Szilard, *The Voice of the Dolphins*, 53, emphasis his.
- ⁴⁶⁶ Quoted in Lanouette, *Genius in the Shadows*, 301.

⁴⁶⁷ See “‘Minimal Deterrent’ vs. Saturation Parity” in Szilard, *Toward a Livable World*, 407-421. According to Lanouette, Szilard first proposed minimal deterrence at the first Pugwash Conference in 1957 (*Genius in the Shadows*, 371).

⁴⁶⁸ In his analysis of the term “Cold War,” Robert L. Scott wrote about the relationship between oxymoron and ambivalence that “once in our reflective consciousness the term seems strange, even inappropriate. Can a war be cold? If so, it is an oxymoron expressing some degree of ambivalence. Even the most vigorous of cold warriors, those completely convinced of the diabolical nature and intentions of their nation’s adversaries, are ambivalent; that is, their words and actions have thus far stopped short, and stopping short is essential to the meaning of cold war. Ambivalence is built into the concept.” Scott, “Cold War and Rhetoric,” 4.

⁴⁶⁹ See Szilard’s short stories “The Voice of the Dolphins” and “The Mined Cities” in *The Voice of the Dolphins*, as well as an essay published in the *Bulletin of the Atomic Scientists*, “‘Minimal Deterrent’ vs. Saturation Parity” in Szilard, *Toward a Livable World*, 407-421. In his introduction to *The Voice of the Dolphins*, Barton J. Bernstein described the bifurcated directions of Szilard’s advocacy. He wrote, “Driven by the fear of mass nuclear destruction, he worked as a political thinker and genial agitator at two levels: formulating long-term strategies to eliminate the bomb and create world peace; and devising short-term tactics to get through a period of crisis and avoid war” (15).

⁴⁷⁰ Szilard, *His Version of the Facts*, 163.

⁴⁷¹ See Sherwin, *A World Destroyed*, 288.

⁴⁷² Szilard, *His Version of the Facts*, 163.

⁴⁷³ Reproduced in Groves, *Now It Can Be Told*, 437 and Kelly, *The Manhattan Project*, 295.

⁴⁷⁴ “The Atomic Bomb: Its First Explosion Opens a New Era.”

⁴⁷⁵ Baldwin, “The Atom Bomb and Future War,” 17. David Seed uses these *Life* quotations to introduce his article on the apocalyptic styles of the Manhattan Project’s official chronicler, William L. Laurence, and John Hersey in “The Dawn of the Atomic Age.”

⁴⁷⁶ Szilard, *Scientific Papers*, 180.

⁴⁷⁷ O’Gorman, “Eisenhower and the American Sublime,” 56.

⁴⁷⁸ Medhurst, Eisenhower’s ‘Atoms for Peace,’” 205 and 213-218.

⁴⁷⁹ Aron, *Century of Total War*, 149.

Chapter 6

Conclusion: The Paradox Abides

“The point is not that atomic weapons constitute a new argument. There have always been good arguments.”⁴⁸⁰ —Robert Oppenheimer

Robert Oppenheimer, speaking to Los Alamos scientists in late 1945, indicated that atomic bombs possessed a persuasive character beyond their technical capacity to destroy that both complemented their functional military purposes and integrated their sheer power with politics, culture, and society. The relative stability of weapons rhetoric affirms this inseparability of weapons and the language used to advocate and resist them. As the preceding chapters show, weapons rhetors tended to reiterate certain arguments and rhetorical tactics that have characterized how people communicate about weapons from ancient Greece to contemporary terrorism. Rather than being a conscious attempt by rhetors to delve into history and memory for inventive cues and commonplaces, the relative stability of weapons rhetoric derives, I have argued, from the ubiquitous presence of the technological conundrum that I call the Malthusian Paradox. The boon and doom of dangerous technologies confronts weapons rhetors with a significant restraint that they must negotiate lest they produce an incomplete argument that ignores the destructive aspects of weapons to tout their preservative power, or ignores their preservative aspects to tout their destructive power. Over time, the ways of describing, advocating, and resisting weapons have coalesced into an observable template of rhetorical choices that get appended and amended according to varying contexts. The hyperbole used to describe the destructive power of different weapons, for instance, is more or less plausible

depending on circumstances. While a dynamite bombing killed one person at Haymarket, one mustard gas shelling decimated an entire battalion at Ypres III, and the nuclear bombings of Hiroshima and Nagasaki killed hundreds of thousands of city dwellers, all three weapons were described as capable of destroying the entirety of human civilization. Such amplification fits a variety of political circumstances from instilling revolutionary fortitude in workers to justifying the “military-industrial complex.”

Yet, the constancy of weapons discourse does not present an insurmountable obstacle to rhetorical invention. It also frees rhetors to calibrate their rhetoric and arguments to new inventions, changing political contexts, and the sizes of populations that must be saved or annihilated in war. Unlike the seeming generic ubiquity of amplification and hyperbole in weapons rhetoric, other rhetorical and argumentative strategies, such as Spies’s cultivation of his own martyrdom, Fries’s and West’s unwavering faith in statistics, and Szilard’s deployment of scientific consensus, each fit the specific situations of their utterance and would not have translated well to different conflicts fought with different weapons. Despite its constancy over time, weapons rhetoric does not constitute a static discourse but a vibrant one, characterized by novelty as much as normalcy.

Yet, when weapons rhetors confront the Paradox again and again, certain overriding rhetorical strategies do emerge that depict a dominant network of WMD discourse. Weapons rhetoric helps the public to imagine weapons so that incongruous practical and ideal goals seem capable of equal, contemporaneous achievement. This discourse helps to constitute how individuals and populations understand how they live and think while designing, manufacturing, advocating, deploying, fearing, reviling, and resisting WMDs. The Paradox in this way contributes to the invention of shared technological and cultural condition across different times,

places, and contexts – a cultural condition characterized by the proliferation of new mass-produced weapons capable of causing destruction on a theretofore unimaginable scale. This technological condition and these elements of weapons rhetoric have a continuing history. They neither originated nor ceased the moment everyone seemed to become terrified of an imagined global nuclear holocaust. The Bomb did not alter weapons rhetoric at first blast, and neither did the Bomb nor its rhetoric originate in tandem.⁴⁸¹

The amplification, statistical proofs, metaphors, and fearful appeals to force, among the other tactics used by the figures in this study, appear and disappear into this complex process, arraying weapons with arguments. In this way, the dominant network of weapons discourse sometimes dominates all political discourse in a literal sense. This dominant discourse sometimes hijacks other political communication and makes it a weapon's subordinate. If people believe weapons advocates, political expediency must be oriented around the likelihood of whether or not people will resort to killing each other with one of many weapons. WMDs thereby have sometimes become the justification for a wide range of U.S. foreign policies from Cold War maintenance and halting the Domino Effect in Vietnam to supporting Iraq and Afghan rebels with weapons before conducting wars of occupation against the former allies. Hannah Arendt wrote of how the means to extermination can dominate political discourse such that “the great political issue of freedom versus total domination is overshadowed by the fear of extinction.”⁴⁸² Because the Bomb materialized a ubiquitous technological anxiety, the Bomb made extinction immanent and imminent and therefore the way people communicated about the weapon became a literal dominant network of discourse that extended influence into far-reaching realms of foreign and domestic policy. In a type of technological circular reasoning, the Bomb

became both the means of conducting foreign policy and the indispensable proof why to enact those policies.

This last point is a key element in the historical trajectory of weapons rhetoric from Malthus to Manhattan Project: although “deterrence” or other factors may have halted nuclear holocaust thus far, militaries remain free to annihilate populations with all other types of “conventional weapons.” The Bomb has not caused “total extinction,” and Omega Man fantasies remain the purview of science fiction. However, any one arbitrary population can obtain, with little difficulty, the means to annihilate an enemy population. The industrialized production of such weapons and the resultant massive arsenals deliver the means to exterminate people like rats or commit genocides. Witness Chemical Ali’s gas attack on the Kurdish city of Halabja in 1988 and the Rwandan civil war. Weapons that now seem anachronistic, but which rhetors once touted as capable of wreaking enormous destruction, still retain the same power to kill regardless of new, more destructive weapons. The technical capacity of the Bomb to possibly end war is null even though it has empowered states to explode entire enemy states.

That technology and rhetoric worked together to enforce fear of agricultural growth, dynamite bombs, mustard gas, and MAD lends credence to Paul Virilio’s argument that weaponry and language globalize violence by conflating speed, time, space, and information. From Virilio’s perspective, technological improvements in weaponry and communication technologies get reflected in the language used to describe them so that language performs the function of weapons of mass destruction. He argued, “This is the very aim of strategic information: to morally and physically deny the adversary the chance to rework his hypotheses, by redefining the space he must cross or the time he has to live.”⁴⁸³ War, language, and

technology combine to appropriate all activities under the purview of a monumental history and make weapons appear deterministic above all else.

In the face of any new ultimate weapon-of-the-moment, this dominant network of discourse presents an all-encompassing, globalized ideology that sweeps all humans into the psychological and physical range of threatening technologies, defining what it means to be “civilized,” “human,” and “humane.” In turn, inventing machines that promise to both wreak destruction and ensure preservation comes to seem logical. The logics that underpin industrialization, overpopulation, total war, mass production, technological appropriation, the democratization of technology, deterrence, escalation, and mutual assured destruction come to seem sensible justifications for the management of populations’ collective fate, even when they appear logically incompatible.

Throughout the preceding analyses I have also endeavored to elucidate the constant tension between rhetoric and violence that weapons help to mediate. Whether one deploys weapons rhetoric, weapons, or both indicates the viability of an individual’s or group’s political agency. Thus, weapons rhetoric functions at the tipping point between communication and destruction. Weapons rhetoric is perhaps the most violent rhetoric short of committing actual bloodshed. And when weapons rhetoric pushes upon this intangible limit, those moments define the character of the conflict that ensues – how and when people will live or die. In one such moment, at Haymarket, Spies pushed his exhortations to dynamite the capitalist establishment to the maximum limit so that when the Haymarket bomb exploded, his bomb talking became coterminous with bomb throwing, regardless of whether he meant it to or not.

The limit that marks the difference between deploying rhetoric versus deploying weapons materializes the ever-changing balance between those who possesses the means to stop

threatening their adversaries and to begin attacking them, and those who do not. The viability of political agency seems to depend on the sometimes equal and sometimes unequal distribution of weapons between revolutionaries and governments. Since industrial mass production arose, new weapons that once may have seemed mysteriously controlled by large companies and governments became well-distributed across diverse populations. Hierarchical control dissipated as the sheer amount of production and their destiny in the consumer marketplace demystified and distributed them. In 1886, dynamite was thus both the weapon of choice for anarchists and the U.S. Army owing to its ease of manufacture and procurement. In the 1920s, Fries recognized the threat posed by chemical weapons in the hands of communists for the same reasons. The same goes for the Bomb. The Bomb is no longer the sole purview of state governments. While H. G. Wells's predicted the ease of obtaining the "simple apparatus" in *The World Set Free*, the missing nuclear devices that disappeared with the Soviet Union's dissolution, the diffusion of nuclear power technology, and the training of untold engineers and scientists have led terrorism policy experts to worry that, like the prevalence of dynamite in 1886, mustard gas in 1918, and ammonium nitrate and thiodiglycol now, the threat of nuclear power is everywhere.⁴⁸⁴

Thus, to review and update some of the rhetorical themes analyzed thus far, a glance at a few examples gleaned from "nuclear terrorism" discourse provides a final contemporary view of the Paradox's ongoing vitality. American nuclear terrorism discourse tends to not stress the great boon of nuclear energy to humanity. Instead, the power of nuclear weapons to maintain U.S. military dominance is assumed, and the more crucial question has become how to re-configure deterrence as the most powerful means of annihilation becomes easier to obtain.

Testifying before the Senate in April, 2008, Under Secretary for Intelligence and Analysis Charles E. Allen spoke of a speculative terrorist bomb. He described how "an

improvised nuclear device will lack the sophistication of a state-developed weapon, might be produced one at a time, with simple or no safety or controls.”⁴⁸⁵ Allen denied the capacity of a terrorist to produce a nuclear device comparable to a “state-developed” one. Rather than threatening less destruction, though, Allen intimated that an “improvised” nuclear bomb presents an even larger threat owing to its simplicity. The lack of safety features and sophistication results in a powerful weapon that a terrorist or other political actor can obtain with much less difficulty than the complex models and protocols that go into producing a state’s stockpile. The “simplicity” of the mechanism thus defines the limit between rhetorical threat and physical threat that a terrorist is able to invent.⁴⁸⁶

As U.S. officials present their case against the depravity of nuclear terrorists, they have attempted to demonstrate the threat is credible enough to warrant a crackdown, yet not credible enough to warrant undue anxiety and fear.⁴⁸⁷ For this reason, when American politicians appeal to fear to justify the interminable “war on terror,” they often reiterate commonplace weapons hyperbole whether they mean to or not. According to Senator Joseph Lieberman, “The American people face no greater or more urgent danger than a terrorist attack with a nuclear weapon. . . . Black markets trade in nuclear secrets and materials. Terrorists are determined to buy, build, or steal a nuclear weapon.”⁴⁸⁸ The scenario described by Lieberman remains neither “inevitable” nor impossible.⁴⁸⁹ Lieberman argued that the diffusion of complex technologies to disperse groups of people poses an immediate and serious threat to national safety. Lieberman turned the logic that democratizing technology should help humanity into a justification for the war on terror, because, he indicated, democratizing the Bomb undermines security. The boon of nuclear energy to humanity became once again its most “urgent danger.” Nuclear weapons, through their symbolic appropriation by terrorists, show that the most sophisticated and powerful weapons can spin out of governmental control when rendered “simple,” even as nuclear terrorism remains a

mere speculative catastrophe. The supposed simplicity and diffusion of nuclear bombs thereby became an ongoing justification for the tenacious pursuit and suppression of terrorist activities.

In a remark made by Senator Susan M. Collins about nuclear terrorism before Congress, she delved into the humane weapons debate to depict effects of a terrorist attack. She testified that, “A nuclear bomb is the ultimate terrorist weapon, causing an unimaginable amount of death, suffering, and horror – precisely the kind of frightening and inhumane outcome that terrorists seek.”⁴⁹⁰ Unlike Fries and West, who dissociated the humaneness and inhumanity of mustard gas by separating material and psychological effects, Collins combined them. The Scope of destruction caused by the “ultimate terrorist weapon” is “unimaginable” because of death *and* horror. The speculative result is “inhumane” owing to the sheer enormity of the possible explosion to inflict injuries on bodies and to inflict a national psychological burden. The symbolic and material effects of nuclear terrorism join together at a terrorist’s rhetorical and technological inventive limit. The nuclear threat of violence is terrorists’ most extreme rhetorical strategy and their most extreme violent action at the last range of their capacity to negotiate. Yet the U.S.’s nuclear stockpile guarantees that anyone who commits an act of nuclear terrorism could get annihilated in kind. For those fighting capitalist domination and U.S. foreign policy, victory in either battle would be a desirable “precise” political outcome of nuclear terrorism, whether rhetorical or actual. Escalation and deterrence continue to explode each other’s logic.

However, lest politicians give the impression that their governance cannot control this colossal predicament, U.S. officials have also downplayed the threat posed by nuclear terrorism, diminishing the effects of a successful attack. The U.S. government must convince citizens that a nuclear explosion will not be *that* bad. “It’s more survivable than most people think. The key is avoiding nuclear fallout,” said an anonymous official in December, 2010.⁴⁹¹ This quotation refers to a government document, *Planning Guidance for Response to a Nuclear Detonation*, published in

2010 by a diverse interagency policy task force.⁴⁹² Overall the document emphasized the number of lives saved if people would shelter themselves from fallout in basements and cars. Seeking shelter from radiation will save lives, but the Bomb poses many more perils than radiation that must be survived. And like Fries and West sometimes ignored the deployment of mustard gas in tandem with other weapons in different contexts, this document's emphasis somewhat dissociated the effects of radiation from the effects of the initial blast and other catastrophic hardships caused by a surprise nuclear explosion. By glossing over the devastation wrought by a blast and the chaos that would ensue, the government makes survival seem like a much more simple prospect than the scenarios depicted by Lieberman and Collins. A new radiation proof version of "duck and cover" has arisen, indicating that augmented amplification remains a commonplace of weapons discourse. Destructive power gets amped up and diminished to make the war on terror sound prudent.

The testimony of Deputy Secretary of Homeland Security Jane Holl Lute before the United States Senate Committee on Homeland Security and Governmental Affairs on September 15, 2010 indicated how government officials continue to simultaneously amplify and diminish nuclear terrorism's potential destructive effects. She stated, "Few would disagree that the detonation of a nuclear device in a U.S. city would have devastating consequences. I don't need to itemize damage and casualty estimates for you." She proceeded to cite an April, 2009 speech in which President Barack Obama "affirmed that terrorist acquisition of a nuclear weapon is the 'most immediate and extreme threat to global security.'" Despite the presence of innumerable other weapons available in far greater numbers, Lute and Obama amplified the threat to elevate the destructive power and probability of one nuclear incident over that of all other weapons available to terrorists. Yet, Lute turned to the technical and material aspects of nuclear terrorism to downplay the possibility that such an incident would even occur. In addition to obtaining

either HEU (highly enriched uranium) or plutonium, a state or non-state terrorist organization, according to Lute, “would also necessitate financial, technical, and logistical resources to construct or modify the device (in most cases), transport it to the target, perhaps across multiple international borders and by various modes of conveyance, and detonate; all without being detected.”⁴⁹³ This list of difficult and risky steps that a terrorist must take in order to commit an act of nuclear terrorism implied that such an undertaking has little plausibility of happening. People should be afraid, very afraid of nuclear-capable terrorists, but not so afraid that they live in a constant state of paranoia and convinced that the U.S. government can do as little to halt a nuclear terrorist as it did to prevent 9/11. Bluster, devices, and words intermingled in Lute’s testimony to create a mirage of semi-preparedness.

In sum, the long historical trajectory from Malthus to Szilard and beyond demonstrates that while discourse shrieks radical newness at the innovation of each device in an endless chain of dangerous technologies, certain rhetorical strategies and tactics have become commonplaces that appear in a disparate array of document types used by people from multifarious political perspectives. And the necessity of negotiating the ever-present problem of the Malthusian Paradox is one primary reason why weapons rhetoric demonstrates this consistency over time. Hence, the usefulness of longitudinal case studies to rhetoricians who seek an understanding of how rhetoric and argumentation function both in specific contexts and in chronological relationship to each other. From early 19th century anxieties about overpopulation and war to speculation about nuclear terrorism, I have endeavored to show how rhetorical forces have contributed to weapons development in tandem with actual machines and within ideological frameworks that brought people “before the bomb” in body and in mind.

Although weapons advocates may downplay a weapon's destructive power, the inventiveness of rhetoric, technologies, and ideas cannot hide what weapons reveal through their killing force – that people have justified reasons to question, wonder about, and fear weapons that could end up annihilating their worlds. The Paradox, as it confronts people with all of its myriad commonplaces, and quirks, contradictions, and complexities reveals an unappealing truth that even powerful individuals, like Maj. Gen. Amos A. Fries, struggle to control the simultaneous rhetorical and destructive forces of weapons. Much like the fraught tension at the limit between violence and rhetoric, the Paradox reveals how language can either fail to control a dangerous technology or to finally exercise control over one just at the moment when an ultimate civilization-smashing, exterministic force looms. At this palpable limit between war and peace, the Paradox demonstrates whether the action a rhetor must take is one of communal preservation or collective violence. To paraphrase Oppenheimer, there have always been good arguments to make more fertilizer and to make more explosives.

⁴⁸⁰ Reproduced in Kelly, *The Manhattan Project*, 370.

⁴⁸¹ Flippant claims that the Bomb altered humanity's basic means of understanding and communicating around. In Hannah Arendt's essay "Understanding and Politics," she avered that totalitarian governments seemed to jar humanity so harshly that people lost their "tools of understanding" politics and human behavior. She wrote, "the very event, the phenomenon, which we try—and must try—to understand has deprived us of our traditional tools of understanding" (310). In her analysis of SDI rhetoric, Rebecca S. Bjork began by stating Trinity "shattered humanity's symbolic construction of the meaning of war" (*The Strategic Defense Initiative*). Because rhetoric impinges upon symbolism, understanding, and communication at myriad levels, these claims insinuate that rhetoric also changed the moment the Trinity Shot exploded.

⁴⁸² Arendt, "Rand School Lecture," 221.

⁴⁸³ Virilio, *Popular Defense & Ecological Struggles*, 17.

⁴⁸⁴ Wells, *The World Set Free*, 80.

⁴⁸⁵ Allen, "Testimony."

⁴⁸⁶ Ned O'Gorman and Kevin Hamilton argued in "At the Interface" that terrorists' and rogue states' lack of technical mastery over nuclear control interfaces delegitimized their nuclear capabilities according to the "modern" and "western" rationalities of legitimate nuclear states that purport to control nuclear weapons with technical mastery. Media representations of non-state or rogue state nuclear powers that ignore their technical capacity suggest "their function is less to inform publics about the dangers of nuclear terrorism and more to perpetuate the ideologies of Western modernity itself" (60). The ability to rationalize nuclear legitimacy according to available technical knowledge and equipment complicates the "simplicity" of the Bomb by making it seem that illegitimate nuclear powers do not so much break technological rules, but ideological rules. The "simplicity" by which nuclear terrorists might acquire weapons breaks the technological rules by subverting the complexity of official international nuclear weapons management.

⁴⁸⁷ Historians Guy Oakes and Ira Chernus argued that the U.S. government worked hard to manage Americans' understanding of nuclear weapons by instilling a pragmatic, rather than crippling, fear of the Bomb. In *The Imaginary War* Oakes argued that the U.S. government's civil defense programs were an elaborate, if self-defeating, system of "emotional management" that attempted to turn Americans' "nuclear terror" into "a more pragmatic nuclear fear" (33). The U.S. government had to "conventionalize" nuclear weapons in order to reduce their effects as "an instrument of mass terror" (51 and 36). In *Apocalypse Management* Chernus argued that President Eisenhower initiated a "new linguistic paradigm" called apocalypse management that functioned to promote stability in a permanently evil world fraught with nuclear weapons (2). Chernus noted that apocalypse management was paradoxical on multiple levels as Eisenhower administered the somewhat peaceful cold war. According to Chernus, "The pursuit of national security through nuclear weaponry ended up only entrenching the nation more deeply in its state of national insecurity" (215).

⁴⁸⁸ Lieberman, "Opening Statement."

⁴⁸⁹ For an overview of competing policy diagnoses for the probability of nuclear terrorism, see Kapur, "Deterring Nuclear Terrorists," 109.

⁴⁹⁰ Collins, "Opening Statement."

⁴⁹¹ Quoted in Broad, "New Advice on the Unthinkable," A3.

⁴⁹² National Security Staff Interagency Policy Coordination Subcommittee for Preparedness & Response to Nuclear Threats, *Planning Guidance to a Nuclear Detonation*.

⁴⁹³ Lute, "Testimony."

Afterword:

Technē – Technology/Rhetoric/Philosophy

In order to delve into the complex relationship between weapons, rhetoric, and the Malthusian Paradox, I asked two primary research questions central to the concept of *technē*: How does technological invention influence rhetorical invention, and how does technological invention influence rhetorical invention? *Technē* grants greater insight into technology rhetoric than just an appraisal of either language or technological design, because its multifaceted inventiveness – characterized by technology, rhetoric, and as I will argue, philosophy – together transform and remake the human environment.⁴⁹⁴ The ancient concept of *technē* may have strong ties to paradox, as suggested by Janet Atwill, but in this afterword I turn my attention away from paradox and toward *technē*.⁴⁹⁵ As intrinsic aspects of technological behavior the co-creative powers of *technē* mesh together and impinge upon each other – technology by making in the concrete and material sense, rhetoric by motivating people to innovate, produce, use, and resist technology, and philosophy by making in the ideological and conceptual sense. Together these varieties of invention function as intermediaries between the environment and its perpetual recreation through innovation.⁴⁹⁶ It is in this sense that *technē* functioned as a type of critical lens for my research. And it is as a critical lens, I suggest, that *technē* helps to explain how people control invention and how invention controls them. *Technē* persuades, and *technē* empowers the invention of machines and the concepts that make sense of them. Without the desirability of killing large numbers of enemy citizens fashioned by ideology, rhetorical appeals and mechanical functionality, hyperbolic depictions of WMDs, for instance, would undermine their own uses. In the remainder of this afterword, I first provide a historical gloss on *technē*'s

etymology. Second, I discuss the theoretical background for this conception of *technē* by examining pertinent rhetorical and technology studies scholarship. I then expand the concept of *technē* to include philosophical invention by examining Martin Heidegger's philosophy of technology. Thus, *technē* brings together three critical fields of inquiry that seek to understand the function of technology in society.

The Greek etymological roots of “technology” – *technē* and *logos* – point toward an understanding of the term that incorporates a wide range of activities requiring artistic skill and craft. According to rhetorician Richard Mckeon, the two terms must be united in order to understand and critique technology, and rhetoric provides their conceptual link as exemplary of both *logos* and *technē*. McKeon considered *technē* an integration of the inventive capacity of these two types of *technai* (technology and rhetoric) in order to define what he called “architectonic art.” The systematized organization of architectonic art is “an art of structuring all principles and products of knowing, doing, and making” that uses “a comprehensive form of the rhetorical device of ‘schematization,’” and such “comprehensive schematization” of behavior derives from both rhetoric and technology.⁴⁹⁷ McKeon explained the link between rhetoric and technology by noting that “The architectonic productive art in the age of ‘technology’ is obviously technology itself given a rhetorical transformation.”⁴⁹⁸ Rhetoric can be considered “the *logos of technē*” in the sense that it encompasses the interrelationship of the world-making capacity of language and the world-making preponderance of machines without abandoning the Aristotelian notion that rhetoric comprises both art and method, or “techno-logy.”⁴⁹⁹

Some rhetorical scholarship has recognized the complex interplay of rhetoric and technology, if not philosophy, and has taken up questions about materiality and rhetoric that suggest the usefulness of *technē* as a critical concept. Lloyd Bitzer, Michael Calvin McGee,

Celeste Condit, Kenneth Burke, and Carol Blair have all written about how bodies, material, and rhetoric interact to produce meaning. I suggest that extending and developing their research entails paying heed to how the functions and capacities of technologies complement and/or undermine the rhetorical tactics and strategies that support and challenge machines and systems. In contrast to many theories of materiality that conceptualize rhetoric as neo-Marxist ideology or forms of Foucauldian governmentality, and thereby move away from the artifacts to become a type of meta-materiality, *technē* keeps the material functions of technologies and their destructive effects close at hand. Yet, it still remains cognizant of inventive immaterial forces – the over-arching concepts of universal power and ideology.

Lloyd Bitzer’s famous definition of rhetoric provides a starting point to expand the rhetorical understanding of *technē*. By defining rhetoric as “a mode of altering reality, not by direct application of energy to objects, but by the creation of discourse which changes reality through the mediation of thought and action,” Bitzer emphasized that rhetors “create discourse” in specific “rhetorical situations” that the material environment “constrains.”⁵⁰⁰ Therefore, rhetors must pay heed to material contingencies in order to “change reality.” But emphasizing material contingency casts doubt upon Bitzer’s dissociation of the “direct application of energy to objects” from rhetoric, owing to the intricate melding of rhetoric and energized objects inherent in the concept of *technē*. I thus propose that uniting Bitzer’s negative, dissociating clause with the rest of his definition of rhetoric grants greater insight into technology rhetoric. To rewrite his definition in line with the concept of *technē*, rhetoric *and* the “direct application of energy to objects” work together as discourse and context impinge upon each other.

In contrast to Bitzer, Michael Calvin McGee argued for a more rigorous incorporation of materiality into rhetorical theory. According to McGee, a competent rhetorician will use “a

material conception of rhetoric, if only in formulary recognition of situational constraints on a would-be advocate's choice of strategy and technique."⁵⁰¹ In order to provide plausible impetus to action, rhetorical invention must make sense in regard to material contingency, and McGee's essay, "A Materialist's Conception of Rhetoric," called attention to how rhetorical critics should incorporate cognizance of the physical world into their theories. Because rhetoric is "an object, as material and as omnipresent as air and water," rhetorical theory must appraise the impact of rhetoric's physical properties.⁵⁰² Therefore, McGee suggested that "a theory of rhetoric can be legitimate only when measured, directly and explicitly, against the objects it purportedly describes and explains."⁵⁰³ Extending this assertion to technology rhetoric indicates that "measurement" must incorporate cognizance of mechanical properties in order to understand their influence on human behavior, so a rhetorician must take the specific design and functionality of a machine into account in order to consider the full rhetorical situation.

Celeste Condit and Jack Selzer made similar arguments about the importance of material context to rhetoric with implied pertinence to technology rhetoric. Condit argued that any rhetorical critique must include an adequate representation of materiality in order to prove its pertinence to human relations. She wrote, "The combination of object and process is necessary for understanding how it is that language has effects in the world—that is, for understanding how meaning is something real, something material, and not merely a function of disembodied spirit or mind."⁵⁰⁴ She therefore suggested adding a "physical component" to the concept of historical materialism. Attention to technological functionality would accomplish Condit's proposal. Jack Selzer concurred that "language is not the only medium or material that speaks."⁵⁰⁵ Technologies "have explicitly coercive functions that rehearse the highly persuasive if less overt ways in which other material realities, cultural practices, and physical bodies shape and persuade," Selzer

continued.⁵⁰⁶ To extend Selzer's argument, *technē* calls for examination of both the material aspects technology rhetoric and of "the rhetorical character" of technology.⁵⁰⁷

Kenneth Burke also recognized the double movement between material and rhetorical world-making with his concept of recalcitrance. According to Burke, "A statement is an attitude rephrased in accordance with the strategy of revision made necessary by the recalcitrance of the materials employed for embodying this attitude."⁵⁰⁸ Furthermore, "recalcitrance forces a speaker to revise their original statements to "induce cooperation."⁵⁰⁹ If an audience's cooperation becomes induced, then the rhetor has successfully melded language with the audience's conception of material factuality. The recalcitrance of "Big Technology" forces rhetors, to an extent, to adjust their language in accordance with how people understand their relationship to machines, a relationship that is both material and ideological.⁵¹⁰

Carole Blair made a similar argument regarding public memorial sites by describing how the physical construction of monuments guides human behavior. According to Blair, "These sites . . . suggest—sometimes prescribe—pathways for a visitor to traverse, and those pathways influence reception significantly."⁵¹¹ The physical artifact thus determines human behavior to an extent, but of course the visitors at memorial sites need not traverse pathways in a pre-mapped pattern when they could choose to clamber over the stones instead. People appropriate artifacts for many uses non intended by their designers, as do rhetors who confront technology.

Technē thus takes up these rhetorical readings of materiality and extends them by calling for a specific focus on incorporating the functional design of technologies into criticism. Technology is persuasive, as technology critics have noted. According to Andrew Feenberg, "Technologies are not mere means to ends; they also shape worlds."⁵¹² Langdon Winner concurred that technologies "are powerful forces acting to reshape [human] activity and its

meaning.”⁵¹³ And if viewed from an overarching perspective, Kenneth Burke’s writing about technology indicates that it operates as a type of rhetorical force.⁵¹⁴ Weapons are not mere tools with which to contextualize rhetorical events, but rather, the weapons and rhetoric are inseparable and cannot, I argue, be understood without each other.

Some technology critics, like Donald A. Norman, Oswald Spengler, and Langdon Winner have also pointed toward the usefulness of melding rhetoric, technology, and philosophy under the term *technē*. Norman’s distinction between “affordances” and “constraints” in *The Design of Everyday Things* indicates how design influences behavior. Norman asked, “How can design signal the appropriate actions?”⁵¹⁵ To answer, he posited that “the natural constraints of objects, physical constraints...limit what can be done,” and “the affordances of objects which convey messages about their possible uses, actions, and functions...suggest the range of possibilities.”⁵¹⁶ A technology’s affordances and constraints limit its ability to suggest its rhetorical uses, and therefore technology impacts rhetoric by constraining and freeing the rhetor at the same time. Norman wrote, “The thoughtful use of affordances and constraints together in design lets a user determine readily the proper course of action, even in a novel situation.”⁵¹⁷ In terms of *technē*’s inventive scope, the recalcitrance of physical design both limits a rhetor’s inventive capacity and opens up a limitless range of world-making opportunities.

Oswald Spengler’s *Man and Technics* advanced a similar formative notion of technology. Spengler defined technology, or *die Technik*, as “the tactics of all living. It is the inner form of the procedure of conflict, with which life is synonymous.”⁵¹⁸ Rather than emphasizing only the artifact, his definition located the essence of technology in strategy and “tactics,” such that technology is a motivated “procedure.” Spengler refined his concept of *Technik* in an additional negative definition that also highlighted procedure: “Technics is not to be understood in terms of

the implement. What matters is not how one fashions things, but what one does with them; not the weapon, but the battle.” Furthermore, “There are innumerable techniques in which no implements are used at all,” such as diplomacy and “the technics of administration, which consists in keeping the State in form for the struggles of political history. There are chemical and gas-warfare techniques... Always it is a matter of purposive activity, never of things.”⁵¹⁹ This far-reaching conception of technology and technique as a type of purposive activity encompassed rhetoric as an active element of technical work when Spengler extended technology to include actions that are inherently persuasive, such as diplomacy. Spengler elaborated that “Technics in man’s life is conscious, arbitrary, alterable, personal, inventive. It is learned and improved. Man has become the creator of his tactics of living—that is his grandeur and his doom.”⁵²⁰ Therefore, *die Technik* is both mechanical and rhetorical in its construction of humanity’s technological condition.

Technology critics have also advanced the idea that technologies are inherently political, which further indicates the usefulness of conceiving rhetoric, technology, and philosophy as co-creative. Technology impacts politics in tandem with rhetoric and philosophy as people deliberate dangerous technologies, the results of which alter how individuals confront states and how states confront people. Delineating the political effects of technologies is central to philosopher of technology Langdon Winner’s scholarship. In *Autonomous Technology*, he called for a type of “political technology,” to pay heed to both how devices are designed for political ends and to how devices can get appropriated, redesigned, and manipulated by politics.⁵²¹ Extending Lewis Mumford’s contention that two types of political technologies exist (authoritarian and democratic), Winner expanded the concept of “political technology” in *The Whale and the Reactor* to argue that all technologies have political characteristics, if they are not

“inherently political artifacts,” like the Bomb.⁵²² Because an artifact’s design and functions open up a range of social activity, their use entails political ramifications, whether intended or not. Hence, technologies are imbued with political implications and contingencies in two ways. First, some artifacts are designed to influence a specific political issue; and second, some artifacts cannot exist without specific political and economic conditions.⁵²³ Winner concluded that tempering technological change with democratic wisdom would recognize the political character of technological problems, and thereby provide a path towards solving humanity’s technological problems.⁵²⁴ Technology’s politically motivated design and the political context in which innovation happens contribute to determining human behavior, and owing to their political nature, the physical makeup of technological artifacts imbues them with what seems like rhetorical force. According to Winner, “The issues that divide or unite people in society are settled not only in the institutions and practices of politics proper, but also, and less obviously, in tangible arrangements of steel and concrete, wires and semiconductors, nuts and bolts.”⁵²⁵ Technologies thus motivate people to engage in political behavior, or not, much like rhetoric does.

I further suggest that because philosophizing resembles a type of skilled invention, it should be included under the umbrella concept of *technē*. Philosophy is not considered a traditional type of *technē*, but philosophy can be conceived as the skilled “art of forming, inventing, and fabricating concepts,” in the words of Deleuze and Guattari.⁵²⁶ Calling philosophy a type of *technē* is especially useful when examining dangerous technologies, because understanding either how a philosophical position helps to create a condition of society, or how a societal condition helps to inform its philosophical theorization, also leads to an understanding of a potential way to dismantle a problem and its philosophical counterpart with the same creative

forces.⁵²⁷ Technology scholar Andrew Feenberg argued that Heidegger, for instance, espoused a philosophy of technology that “constitutes a new type of cultural system that restructures the entire social world as an object of control,” and as a consequence of this technological world-restructuring, “technology is not simply a means but has become an environment and a way of life.”⁵²⁸ Philosophy invents the world alongside rhetoric and technology, which demonstrates the material ramifications of philosophy as it participates in, for instance, the rationalization of WMD ideology. The failure of rhetoric to solve the complex dilemmas posed by dangerous technologies contributes to the widespread belief that technology has come to alienate, dominate, and overwhelm humanity in all aspects of life, including rhetoric. Technology has become a universal and insurmountable problem, which has become a common *topos* of technology discourse. Heidegger’s philosophy of technology exemplifies this perspective, but its explicit appropriation of *technē* indicates that attention paid to invention could help to reverse technological fatalism. For these reasons, philosophy deserves consideration as a type of *technē*.⁵²⁹

In “The Question Concerning Technology,” Martin Heidegger portrayed humanity as doomed to suffer technology’s apparent total domination of human life. Much like Ellul’s conception of “the technological society,” Heidegger argued that the ubiquity of technology in human affairs constitutes one of technology’s fundamental characteristics, and that the “essence of technology,” *Gestell*, “enframes” humanity within technology. Heidegger defined this “frame holding sway” as a process in which “the essence of man is framed, claimed, and challenged by a power which manifests itself in the essence of technology, a power which man himself does not control.”⁵³⁰ Heidegger’s conception of autonomous technology’s *Gestell* leaves humanity as mere “standing-reserve,” or a type of ordered living power supply to the technological order.⁵³¹

After asserting the futility of using language to solve technological problems, Heidegger later gave up hope that humanity could solve its technological predicaments, and turned to God for salvation.⁵³² Ascribing accountability for technological change to divine power stripped instrumental rhetorical agency from people. Moreover, many examinations of weapons rhetoric seem to corroborate Heidegger's assertion that rhetoric fails to alter the apparent domination of humanity by technology. Rhetorical scholarship has portrayed a bleak outlook for humanity in which rhetors, such as "Nuclear Freeze" proponents and nuclear power technocrats, fail to solve the complex dilemmas posed by nuclear weapons and energy.⁵³³

However, before he asserted that "only a god can save us," Heidegger proposed that *technē* offers humanity a way of formulating a solution to technological problems. Although Heidegger's religious turn abrogated his claims in "The Question Concerning Technology," his previous philosophy of technology resurrected rhetorical force from technological subjugation, because *Technē* is inherent to both the creation of technological problems and their correctives. Despite the bleak situation faced by humanity, enframed by *Gestell*, Heidegger proposed that while "technology" is one materialization of "*technē*," the two terms are not synonymous because technology refers to an end product, while *technē* refers to the inventive means that empowered the production of technology. Heidegger therefore argued that the only way to reorder humanity's relationship with technology is to implement the non-technological essence of technology, *technē*, which could "come to presence" the "possible arising of the saving power." Similar to artistic *poiēsis*, which was once "also called *technē*," *technē* reveals, or "brings forth truth into the splendor of radiant appearing."⁵³⁴ This creative revealing subjugated humanity to enframing technology, but the essence of *technē* is not in itself technical. Therefore, *technē* has the potential to reveal another creative being in the world that is less technologically

menacing. Heidegger quoted poet Friedrich Hölderlin to describe this dual function of *technē*: “But where danger is, grows/The saving power also.”⁵³⁵ In more concrete terms Heidegger wrote that, “Because the essence of technology is nothing technological, essential reflection upon technology and decisive confrontation with it must happen in a realm that is, on the one hand, akin to the essence of technology, and, on the other, fundamentally different from it.”⁵³⁶ Artistic creation and knowledge, if forward looking, may therefore “presence” a solution to modernity’s technological enframing, which indicates that humanity can use the same inventive forces that have led to its subjugation to invent a way to free humanity. So, if *technē* is the solution, that solution must be communicated to others with rhetoric to presence being.⁵³⁷ Understanding the full range of *technē* that grants humanity the capacity to use rhetoric to invent solutions to technological problems would offer a more programmatic character to Heidegger’s rather vague theorizations about how to cure society of its technological ills.

In response to the fatalism and the overwhelming technological force posited by Heidegger, rhetoric offers one possible means to begin refusing, chipping away at, undermining, and attacking “the technological society.” Technology does seem to dominate society in many ways, but humanity retains some degree of autonomy from its machines and systems, such that the dark abyss of Ellul’s *la technique* and Heidegger’s *Gestell* appears abstract, a mere philosophical construction. People can refuse to believe Ellul’s thesis that all communication is “propaganda.” And if humanity must refuse “the technological society,” then it can use rhetoric to invent ways to do so. Janet Atwill asserted that this transformative power imbues *technē*: “*Technē* challenges those forces and limits [compulsion, necessity, and fate] with its power to discover and invent new paths.”⁵³⁸ And *technē* “makes intervention and invention possible,” she wrote.⁵³⁹ If the *technē* of rhetoric entails the “art of discovering the available means of

persuasion,” then in a society that appears wholly integrated with technology, that art must persuade people by both negotiating the philosophical and ideological concepts of human society that define it as “technological,” as well as negotiating the preponderance of machines.⁵⁴⁰

Empowered by *technē* critics can help elucidate society’s responses to a world not yet universally subjugated to technology, but teetering on the brink. Rhetors have the freedom to resist the technological system and reveal that resistance to others rather than waiting around for a god to save humanity.

⁴⁹⁴ Steve Fuller anticipated the pertinence of *technē* to both rhetorical scholarship and Science and Technology Studies [STS] by calling for a rhetorical intervention into technology studies. In *Philosophy, Rhetoric, & the End of Knowledge*, Fuller posited that injecting STS with a deeper understanding of rhetoric will result in technology scholarship more relevant to all academic disciplines. Fuller’s argument points toward the concept of *technē* by describing both rhetoric and the quest for scientific and technological knowledge in terms of their creative capacity. Fuller explained that, “the idea that the ultimate ground for the ‘Knowledge is Power’ equation is *rhetorical*. For the thread that connects the history of science from the Greeks to the present day is that people come to be convinced that particular forms of knowledge are embodied in the world—in skillful people and crafted goods—and are, in that sense, the hidden sources of power over the world” (115).

⁴⁹⁵ Janet Atwill has pointed out how the concept of *technē* has close ties to the Paradox. She wrote, “If *tychē* is identified with fate, then *technē* would be one of fate’s most threatening adversaries—or humankind’s most beneficial ally” (Atwill, *Rhetoric Reclaimed*, 94). Also see Atwill’s *Rhetoric Reclaimed* for an extensive etymology of the term *technē*, and a history of its usage.

⁴⁹⁶ Richard Doyle developed a sense of the movement between technology and communication in a theory of material rhetoric that he terms “rhetorical software.” He drew attention to “the relational and material interactions that make possible the emergence of scientific statements. While highlighting the textuality of scientific practices, the term avoids a textual determinism: as any user of software knows, software is usable only within a network of hardware” *On Beyond Living*, 7.

⁴⁹⁷ McKeon, “The Uses of Rhetoric in a Technological Age,” 2.

⁴⁹⁸ McKeon, “The Uses of Rhetoric in a Technological Age,” 12.

⁴⁹⁹ McKeon, “The Uses of Rhetoric in a Technological Age,” 13. In *Metaphysics*, Aristotle linked *technē* and *logos* to help define human existence. He wrote that, in addition to experience, “the human race lives also by art [*technē*] and reasoning [*logos*]” (689 [980b]). Also see George A. Kennedy’s appraisal of Aristotle’s rhetoric in the introduction to Aristotle, *On Rhetoric*, 12-13.

⁵⁰⁰ Bitzer, “The Rhetorical Situation,” 60.

⁵⁰¹ McGee, “A Materialist’s Conception of Rhetoric,” 29. McGee used a nuclear explosion and radiation analogy to describe the situating of rhetoric in materiality (39).

⁵⁰² McGee, “Materialist’s Conception,” 26.

⁵⁰³ McGee, “Materialist’s Conception,” 26.

⁵⁰⁴ Condit, “The Materiality of Coding,” 336.

⁵⁰⁵ Condit, “The Materiality of Coding,” 338; and Selzer, “Habeas Corpus,” 8.

⁵⁰⁶ Selzer, “Habeas Corpus,” 8.

⁵⁰⁷ Selzer, “Habeas Corpus,” 9.

⁵⁰⁸ Burke, *Permanence and Change*, 255.

⁵⁰⁹ Burke, *Permanence and Change*, 258-259; and Burke, *A Rhetoric of Motives*, 43.

⁵¹⁰ For an analysis of Burke’s rhetorical concept of Big Technology, see Hill, “The Human Barnyard.”

⁵¹¹ Blair, “Contemporary U.S. Memorial Sites as Exemplars of Rhetoric’s Materiality,” 47.

⁵¹² Feenberg, *Transforming Technology*, 124.

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- ⁵¹³ Winner, *The Whale and the Reactor*, 6.
- ⁵¹⁴ Hill, "The Human Barnyard."
- ⁵¹⁵ Norman, *Design of Everyday Things*, 82.
- ⁵¹⁶ Norman, *Design of Everyday Things*, 82.
- ⁵¹⁷ Norman, *Design of Everyday Things*, 82.
- ⁵¹⁸ Translation mine. In German: "Die Technik ist die Taktik des ganzen Lebens. Sie ist die innere Form des Verfahrens im Kampf, der mit dem Leben selbst gleichbedeutend ist" (7). Jacques Ellul's concept of *la technique* comes close to paralleling Spengler's concept of *die Technik*, because both authors referred to the pervasive ordering of all aspects of human life. In their perspective, technology comprises not only machines, but also systems, techniques, and designs.
- ⁵¹⁹ Spengler, *Man and Technics*, 10-11, emphasis his.
- ⁵²⁰ Spengler, *Man and Technics*, 30, emphasis his.
- ⁵²¹ Winner, *Autonomous Technology*, 333.
- ⁵²² Mumford, "Authoritarian and Democratic Technics"; and Winner, *The Whale and the Reactor*, 34.
- ⁵²³ Winner, *The Whale and the Reactor*, 22.
- ⁵²⁴ Winner, *The Whale and the Reactor*, 55.
- ⁵²⁵ Winner, *The Whale and the Reactor*, 29.
- ⁵²⁶ Deleuze and Guattari, *What Is Philosophy?* 2.
- ⁵²⁷ Elaine Scarry wrote about the influence of objects on ontological production and the influence of ontological production on objects: "The imagination's object is not simply to alter the external world, or to alter the human being in his or her full array of capacities and needs, but also and more specifically, to alter the power of alteration itself, to act on and continually revise the nature of creating." *The Body in Pain*, 324.
- ⁵²⁸ Feenberg, *Critical Theory of Technology*, 7-8.
- ⁵²⁹ Furthermore, one of Heidegger's students, Greek Philosopher Kostas Axelos, used Heidegger's "The Question Concerning Technology" as impetus to theorize his own philosophy of technology based on "the *logos of technē*." *Alienation, Praxis, & Technē in the Thought of Karl Marx*, xv and 331.
- ⁵³⁰ Heidegger, "Only a God Can Save Us," 107.
- ⁵³¹ Heidegger, *The Question Concerning Technology*, 17.
- ⁵³² Heidegger, "Only a God Can Save Us," 107. Ellul did the same. See "On Dialectic," 297 and 308; and Ellul, "Nature, Technique, and Artificiality," 268.
- ⁵³³ See Farrell and Goodnight, "Accidental Rhetoric"; Fisher, "Narration as a Human Communication Paradigm"; Goodnight, "On Questions of Evacuation and Survival in Nuclear Conflict"; Hogan, *The Nuclear Freeze Campaign*; and Ivie, "Metaphor and the Rhetorical Invention of Cold War 'Idealists.'"
- ⁵³⁴ Heidegger, "The Question Concerning Technology," 32 and 34.
- ⁵³⁵ Heidegger, "The Question Concerning Technology," 28 and 34.
- ⁵³⁶ Heidegger, "The Question Concerning Technology," 35.
- ⁵³⁷ In *Being and Time*, Heidegger asserted that "Aristotle's *Rhetoric* must be understood as the first systematic hermeneutic of the everydayness of being-with-one-another," indicating that rhetoric functions to communicate alterations to typical human behavior (130). Cliff Christians argued in "Ellul on Solution" that for Ellul's solution to become a feasible challenge to "the technological society" it must be communicated to others in order to induce others to also adopt a viable solution.
- ⁵³⁸ Atwill, *Rhetoric Reclaimed*, 48.
- ⁵³⁹ Atwill, *Rhetoric Reclaimed*, 96.
- ⁵⁴⁰ Aristotle, *On Rhetoric*, 36 [1355b].

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