

Global Warming and the Dialectic of Enlightenment  
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“[T]he sovereignty of man lieth hid in knowledge.”<sup>1</sup>  
-Francis Bacon

“In the most general sense of progressive thought, the Enlightenment has always aimed at liberating men from fear and establishing their sovereignty. Yet the fully enlightened earth radiates disaster triumphant.”<sup>2</sup>  
-Max Horkheimer and Theodor Adorno

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<sup>1</sup> Francis Bacon quoted in Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment* (New York: Herder and Herder, 1969), 3.

<sup>2</sup> Horkheimer and Adorno, 3.

*Abstract: Writing in 1947, Horkheimer and Adorno announced that, contrary to the beliefs of many of the most prominent seventeenth and eighteenth century intellectuals, “Enlightenment is totalitarian.” The two Frankfurt School critical theorists argued that rationalization of nature and society is inextricable from the domination of each. While enlightened man thought he had escaped myth, he found it had only returned with a monstrous new systematized power, exemplified in fascism. Horkheimer and Adorno’s student Habermas holds that the liberating prospect of Enlightenment is not lost, and that it can be reclaimed by engaging in “communicative rationality,” which allows for normative reflection where “instrumental rationality” does not. With the concept of communicative rationality, Habermas rises to the challenge posed by his teachers that “the Enlightenment must consider itself, if men are not to be wholly betrayed.” In this paper I explore the path of Enlightenment’s dialectic and analyze its pertinence to the problem of global warming. I describe how the Enlightenment relationship to nature both created anthropogenic global warming and allows us to diagnose it, and argue that the best way to address climate change effectively is to reinvigorate the practice of the Enlightenment’s political principles.*

Global warming is a unique and incredibly important problem for humankind to address. The last few centuries of accelerated technological innovation and industrial production have resulted in atmospheric change that threatens to devastate much of the life on this planet, raise the sea level, cause heat waves, heavy rainfall, extreme high tides, tropical cyclones and droughts.<sup>3</sup> Identifying the phenomenon of anthropogenic global warming and predicting the level of devastation from it requires the scientific method, that same rationalized and systematized probing of nature whose application led to the problem. Diminishing the future devastation requires modern society to change deeply entrenched activities and systems. If greenhouse gasses from industrial processes are trapping abnormal amounts of heat from sunlight and increasing the temperature of the earth, then people concerned about the future of the species and life on earth generally will want to mitigate the ongoing human-caused damage.

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<sup>3</sup> Intergovernmental Panel on Climate Change Working Group II, *Climate Change 2001: Impacts, Adaptation, and Vulnerability*, Third Assessment (Cambridge: Cambridge University Press, 2001), 3-17.

Changing major economic and social processes is no easy task, to put it lightly. In order to prevent extreme global temperature increases, industrialized countries like the United States must considerably cut greenhouse gas contributions from transportation, heat, energy, and agriculture as well as consider how land use affects global climate. Both citizens and businesses would need to make significant changes to their daily practices, and alternative energy sources would likely need to be seriously pursued. Even cutting emissions to previous levels would not halt the warming that is already underway.<sup>4</sup> President George W. Bush has said that the U.S. will not sign the Kyoto Protocol, which sets deadlines for reduced greenhouse gas emissions, because doing so would harm the American economy to an unacceptable extent. He also disagrees with the portion of the protocol that allows developing nations such as China and India to be held to different emissions standards than the U.S.<sup>5</sup> Although the U.S. is among the top emitters of greenhouse gasses, determination to keep its current economic machinations without major alterations precludes meaningful effort to mitigate anthropogenic global warming.

Human-induced climate change is not the first issue that raises questions about how the human relationship to nature affects human political relationships. Scientific knowledge and extraction of specific natural resources are prerequisites to the creation of modern weapons, which have unquestionably impacted humankind in scores of wars and conflicts. Conversely, the same can be said of modern medicine: The body and the

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<sup>4</sup> Intergovernmental Panel on Climate Change Working Group I, "Summary for Policy Makers," *Climate Change 2007: The Physical Science Basis*. Solomon et al. ed. (New York: Cambridge University Press, 2007, accessed January 21, 2008); available from [http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1\\_Print\\_SPM.pdf](http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Print_SPM.pdf), 12-16.

<sup>5</sup> George W. Bush, "Letter from the President to Senators Hagel, Helms, Craig, and Roberts" (March 13, 2001, accessed January 21, 2008); available from <http://www.whitehouse.gov/news/releases/2001/03/20010314.html>.

natural elements surrounding it are studied so as to prolong and protect human life. Whereas the human import of weapons and medicine is direct, the effects of emitting large amounts of greenhouse gasses, for the good of our present economy, are indirect and intergenerational. If major emitters such as the U.S. and China continue burning fossil fuels at the present rate or greater, an unknown but large number of people will be adversely, if not fatally, affected in the future. Technology is purposive and meant to affect human life, while the multi-century process of changing the earth's climate, and thereby living conditions for people not yet born, is incidental. Despite global warming's accidental cause, however, it is deeply tied in to the creation and production of modern technologies. While not deliberate, its existence, causes and remedies have come to light and now comprise a new technological challenge.

Before technologically-induced climate change, the technologically facilitated horror of the twentieth century caused many to question and perhaps disavow the Enlightenment concept of progress. After gassed trenches, firebombed cities, concentration camps, and the total destruction wreaked by the atom bomb, it seemed that humans sought to unravel nature's secrets in order to bludgeon each other with them. Science's systematized knowledge could in many cases answer the question of *how* to do something, but the coterminous collapse of a common moral system in the West left a void to answer whether that something *should* be done. This quandary is called the dialectic of enlightenment.

Though the original thinkers who wrote about the dialectic of enlightenment were concerned with the products of rationality that affected humans directly and negatively, such as modern weaponry and state tyranny, the indirect effects of industrial greenhouse

emissions intersect at many points with the dialectic. Most obviously, anthropogenic global warming is a product of centuries of science and technology. The Enlightenment sought to liberate humankind from the tyranny of rulers as well as the “tyranny of nature.”<sup>6</sup> The concerted effort to battle the tyranny of nature, however, may have contained its own foil. Centuries of exploiting the natural world for human purposes have upset a balance and could unleash an unprecedented natural tyranny in the form of extreme climate events, higher temperature and higher sea level. On another level, diagnosing the problem and its causes would not be possible without the scientific worldview and institutions that we now take for granted. The experimental method, now ubiquitous, is not much older than the beginning of industrialization; Francis Bacon championed the method in the early seventeenth century, about one hundred and fifty years before the industrial revolution, generally dated around 1750. If the U.S. rises to the challenge posed by global warming, it at least has a method by which to find solutions. Science’s expertise is finding the *how*. The crucial element, however, will prove to be finding the *should*. In order to address human-caused climate change, “[a]ll it takes is political will,” according to Al Gore.<sup>7</sup> The former vice president makes it sound very easy. When one considers, however, that for more than a century the *how* governing the American economy has been *how can we best exploit the earth’s resources for today?*, establishing whether we *should rethink our entire approach to nature and change our whole system accordingly for the good of future generations* can seem quite daunting, especially when powerful economic entities are so vested in the status quo.

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<sup>6</sup> Lewis P. Hinchman, “Long Ago and Far Away,” *Polity* 31, no. 2 (Winter 1998): 353.

<sup>7</sup> Al Gore, “The time to act is now: the climate crisis and the need for leadership” (*Salon.com*, November 4, 2005, accessed December 17, 2007); available from <http://dir.salon.com/story/opinion/feature/2005/11/04/gore/index.html>.

In response to this challenge, I argue that global warming constitutes another step in the dialectic of enlightenment, and that, as a phenomenon, human-induced climate change calls into question the modern human relationships to the political, the natural, and the rational in novel ways. I begin this paper with a brief examination of early Enlightenment thought.<sup>8</sup> Next, I provide an interpretive overview of the Western approach to nature, with respect to both humankind's knowledge of nature and the uses to which that knowledge is put. From there, I explore what some major thinkers from the 1600s to the present write about how that approach to nature affects the social-political realm, including the concept of the dialectic of enlightenment. Lastly, I appraise how the problem of global warming fits into existing frameworks of modern rationality as well as the ways in which it ushers in new challenges to enlightenment.

### The History

Starting particularly in the eighteenth century, writing abounds on the nature of the Enlightenment and its meaning for society. Perhaps most famous of all is Immanuel Kant's 1784 response to the question, "What is Enlightenment?" Kant's essay begins:

Enlightenment is man's emergence from his self-imposed immaturity. Immaturity is the inability to use one's understanding without guidance from another. This immaturity is self-imposed when its cause lies not in lack of understanding, but in lack of resolve and courage to use it without guidance from another. *Sapere Aude!* [dare to know] "Have courage to use your own understanding!"—that is the motto of enlightenment.<sup>9</sup>

From the concept of "guidance from another," Kant explains how this immature, misplaced trust unjustly puts people at the bottom of the chain of political order. Reason

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<sup>8</sup> When capitalized, 'Enlightenment' will refer to the historical period, and when in lower case, 'enlightenment' will refer to the broader process of rationalization, either of natural or political thought.

<sup>9</sup> Immanuel Kant, "An Answer to the Question: What is Enlightenment," (1784, accessed 5 December 2007); available from <http://www.english.upenn.edu/~mgamer/Etexts/kant.html>; Internet.

is a tool for liberation. If people would shake their immaturity, trust their own reason, it would not be “so easy for others to establish themselves as their guardians.”<sup>10</sup> Only society’s guardians benefit from this asymmetry of knowledge and reason, which is why it is so important to Kant that people level the playing field by adopting rationality for themselves.

Some of Kant’s contemporaries, however, are skeptical that mankind can do without guardians. Edmund Burke’s equally famous indictment of revolutionary ideals targets not simply the arguments of Kant and other proponents of the Enlightenment but an event taken to be the manifestation of those ideas. In his *Reflections on the Revolution in France* (1790), Burke excoriates the theory and practice of “despising everything that belonged to you”<sup>11</sup> in the form of tradition, the seeming consequence of trusting in one’s own reason rather than in established authority and customs. Unlike Kant, Burke does not grant that all men are or can be prudentially wise and instead favors the wisdom of the ages that brought men their contemporary order. Although at times insufficient in some ways, tradition, for Burke, remains superior to the chaotic alternative. Addressing the revolutionaries in France, he writes, “You had all these advantages in your ancient states, but you chose to act as if you had never been molded into civil society and had everything to begin anew.”<sup>12</sup> Burke is not opposed to all revolutions (favoring the Americans and the Irish over their foreign colonizer), but believes it paramount that people respect their own organic traditions.

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<sup>10</sup> Ibid.

<sup>11</sup> Edmund Burke, *Reflections on the Revolution in France*, excerpts from Edmund Burke, Works (London, 1867, accessed 5 December 2007); available at <http://www.fordham.edu/halsall/mod/1791burke.html>; Internet.

<sup>12</sup> Ibid.

Similar questions and concerns are raised all over Europe at this time, most notably by groups specifically dedicated to determining what enlightenment is, how it ought to be carried forward, to what degree, and at what pace. In eighteenth century Berlin, members of the *Mittwochsgesellschaft*, calling themselves “Friends of the Enlightenment,” discuss and debate these matters within the context of Frederick the Great’s rule in Prussia, where the “Enlightened monarch” had recently eased censorship laws and punishments for religious unorthodoxy. Members lament the public’s poor performance at taking advantage of these freedoms. Even within their secret,<sup>13</sup> pro-Enlightenment society, doubts remain as to the safety of opening all matters to criticism. Members wonder whether “free and unrestricted discussion of religious, moral, and political concerns ... undermine the conventional mores and beliefs on which society rest[s]”?<sup>14</sup> One person from the *Mittwochsgesellschaft* assures the group of its mission in light of this specter. First, he mentions the recent successful hot-air balloon flight of the Montgolfier brothers, which he characterizes as a glowing example of the fruits of reason. He then acknowledges the uncertainty surrounding the question of whether enlightenment’s “great upheaval” will bring about “the betterment of society.” “Would one on account of this hesitate to promote progress?” he asks, and then concludes, “The discovery of eternal truths is in and for itself good; their control is a matter for Providence.”<sup>15</sup> The member’s answer demonstrates how supporters of the Enlightenment

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<sup>13</sup>James Schmidt, *What is Enlightenment? Eighteenth Century Answers and Twentieth Century Questions* (Berkeley: University of California Press, 1996), 3. The “Wednesday society” was underground “because ‘the seal of secrecy’ protected them from both the fear of offending patrons and the ‘thirst for honor or praise.’”

<sup>14</sup> *Ibid.*, 3-4.

<sup>15</sup> *Ibid.*, 4.



maintain their position in the face of Burke and other critics: knowledge is a worthy end in itself.

The comment regarding the hot-air balloon is a reminder that the Enlightenment challenges and changes relationships not only between individuals and society but also between humans and nature. In *Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500-1700*, Peter Dear traces the Scientific Revolution's major change in Western natural thought, which leads up to the Enlightenment. Whereas natural philosophy begins with the abstract and deductive Aristotelian tradition, in which experimentation is not regarded as the primary means by which one comes to understand the world,<sup>16</sup> it "reverses" into one that is practical, inductive, and most familiar to us today.

European learned culture ... had undergone a shift from a stress on the *vita contemplativa*, the "contemplative life," to a stress on the *vita activa*, the "active life" .... "Knowing *how*" was now starting to become as important as "knowing *why*." In the course of time, those two things would become ever more similar, as Europe learned more about the world in order to command it.<sup>17</sup>

This quotation brings us to the focus of this paper: The enlightened relationship between humans and nature affects the relationship between individuals and society, and vice versa. As we will see, how each of these relationships exactly affects the other is a matter of debate among numerous thinkers over the course of centuries. Foremost among the characteristics of the modern period is humankind's incredible manipulation of nature for specific ends, or "instrumental rationality." The liberal shift from monarchies and

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<sup>16</sup> "For Aristotelians ... the philosopher learned to understand nature by observing and contemplating its 'ordinary course,' not by interfering with that course and thereby corrupting it. Nature was not something to be controlled." From Peter Dear, *Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500-1700* (Princeton, N.J.: Princeton University Press, 2001), 7.

<sup>17</sup> *Ibid.*, 170.

aristocracies to democracies and republics ultimately coincides with the centuries (roughly the 1600s onward) of unprecedented technological innovation let loose by applied science. Kant encourages the citizen to discern political reality divorced from the self-interested traditions of his masters. Likewise, the most influential natural philosophers immediately preceding Kant want to uproot basic understandings about the universe with an eye to the technological usefulness the new knowledge can render.

Few scholars dispute that the Scientific Revolution constitutes a major historical change in the human-nature relationship.<sup>18</sup> A common starting point when thinking about this period is Copernicus's heliocentric theory of the universe in *On The Revolutions of Celestial Spheres*, which eventually and famously shatters the Christian dogma of an earth- and thereby a human-centered universe. Galileo continues in this direction, expanding upon and correcting Copernican theory along the way. The common theme running throughout the successive scientific discoveries is a rejection of Aristotelian, deductive natural thought. The empirical, inductive method that characterizes the Scientific Revolution and ultimately replaces the old natural philosophy is sometimes called the Baconian method, named after one of the most important scientific thinkers, Francis Bacon. Perhaps even more important than empiricism in the Baconian method is the practice of experimentation, for the crux of modern human-nature relations is "not just experiencing but planned experiencing"<sup>19</sup> and the applicable knowledge drawn from it.

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<sup>18</sup> Some disagree, however, that that the Scientific Revolution can be described accurately as a "rationalization" of science. See Thomas Kuhn *The Structure of Scientific Revolutions*, 3<sup>rd</sup> ed. (Chicago: University of Chicago Press, 1996). In any case, it undoubtedly counts as a serious break with tradition.

<sup>19</sup> See Robert. K. Faulkner, *Francis Bacon and the Project of Progress* (Lanham, M.D.: Rowman & Littlefield Publishers, 1993), 9.

Implicit in Kant's call to rationality is a consistency, a world of universals that each reasoning person can discover by oneself, without "guardians" as liaisons. Similarly, the natural world is consistent enough to be predictable. If a natural philosopher, by now a "scientist," does x, nature responds y with great regularity. The human utility is apparent; if one now wants y, one must experiment to find a causal x.

By no coincidence, Bacon understands well the social implications of his natural philosophy. His problem with *vita contemplativa* is that it lacks human utility. Nature ought not to be deduced and pondered upon in abstract scholarship, as in the old Aristotelian physics so prominent in academies into 1500, but rather interacted with experimentally and understood for the good of man. "[W]e cannot command nature except by obeying her," writes Bacon, a proponent and prophet of humankind's impending, systematized command of nature.<sup>20</sup> Experiments bring nature's laws to light, and obedience to those laws constitutes a form of command unique to the human species. Those with this scientific command will likewise be enabled to command others through technical superiority.

Bacon views extension of the state through the use of technology as a positive occurrence,<sup>21</sup> sharing none of our contemporary nervousness about authoritarianism or totalitarianism. He lauds the inventions of gunpowder and the compass for expanding civilization to "barbarous districts" and seems at times unambiguous about the positive effects his experimental method will have on humanity: "Discoveries carry blessings with them, and confer benefits without causing harm or sorrow to any."<sup>22</sup> Here it seems Bacon

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<sup>20</sup>Francis Bacon, *The New Organon*, Book Two in *Selected Philosophical Works*, ed. Rose-Mary Sargent (Indianapolis: Hackett Publishing, 1999), 147.

<sup>21</sup> Notably, he does this in the introduction to his 1620 *Novum Organum*, or the "new instrument."

<sup>22</sup> *Ibid.*, 146.

foresees the expansion of humankind's technological innovation as benefiting the species without exception.

Despite that last claim, though, Bacon does not hold unequivocally that application of the new science will exactly parallel positive political developments. Indeed, he anticipates that technology might well eclipse social interests, though he sees little that can be done to resolve this conflict:

Although the roads to human power and to human knowledge lie close together, and are nearly the same, nevertheless on account of the pernicious and inveterate habit of dwelling on abstractions, it is safer to begin and raise the sciences from those foundations which have relation to practice, and let the active part itself be as the seal which prints and determines the contemplative counterpart.<sup>23</sup>

Indeed, Bacon's observations prove remarkably correct. In the centuries following his death, the "contemplative counterpart" to applied science takes a back seat to the exciting innovations experimental empiricism produces. Enlightenment thinkers ebulliently wed reason and progress. Major Enlightenment philosopher and early political scientist Marquis de Condorcet speculates about the possibilities in production and medicine: unimaginable efficiency and cures for diseases. He wonders, "Would it be absurd, then, to suppose that this perfection of the humanity species [sic] might be capable of infinite progress?"<sup>24</sup> Hence, Europe sets out on the Baconian project; men learn to obey nature in order to control it, thus unleashing a power of mythological scale as myth simultaneously declines in the face of Enlightenment rationality.

In the twentieth century, critical theorists revisit Bacon's predicted dominance of "those foundations which have relation to practice" over their "contemplative

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<sup>23</sup>Ibid., 149.

<sup>24</sup> Quoted from Condorcet in John Barry, *Environment and Social Theory* 2<sup>nd</sup> Edition (London: Routledge, 2007), 43-44.

counterpart.” They analyze the tension within enlightenment: the way in which the application of knowledge from the scientific human-nature relationship overtakes contemplation. What was once gunpowder and the compass is now the atom bomb and murderous, high-tech government. Ultimately, the critical theorists lament the realization of Bacon’s prophecy and ponder social humankind’s escape from technological humankind’s hell. Bacon has foreseen what hundreds of years later is termed “the dialectic of enlightenment.”

An explanation is in order about the influences on which critical theorists have drawn, the concept of the dialectic in particular. The dialectic is commonly summarized as the process of antithesis meeting an original thesis and forming synthesis. To put it another way, an existing line of thinking contains a contradiction, at which time an opposing line of thinking emerges that proves equally unviable and a synthesis of the functioning elements of the two remains. Sometimes the synthesis contains contradictions of its own, and the process starts again with the old synthesis as a new thesis. The process is repeated until reaching a final state free of internal contradiction.<sup>25</sup> G.W.F. Hegel’s dialectic merits its own explanation because the concept becomes crucial to the twentieth century discussion of the dialectic of enlightenment. Hegel lays important foundations for Karl Marx, who in turn lays equally important foundations for the critical theorists who take Bacon’s prediction up again in light of both Hegel and Marx.

In the *Philosophy of History*, Hegel traces this abstract process of the dialectic in Western thought from Ancient Athens through the French Revolution. The thesis of Ancient Athens is its customary morality in which the good is that which is good for the

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<sup>25</sup> Both this paragraph and the following section on Hegel are drawn from Peter Singer, *Hegel: A Very Short Introduction* (Oxford: Oxford University Press, 2001), 14-31, 100-103.

city-state. Though communal values are shared there, they are passed down by tradition rather than agreed upon by each individual citizen using his own reasoning. Hegel calls this the form of freedom rather than the substance of freedom. To experience the substance of freedom, one must make a decision purely rationally and not because one has been told that such a decision is good. As an example of reliance on the opinions of others, the Greeks seek guidance from oracles before making important decisions rather than reasoning on their own, hardly an enlightened practice. For Hegel, Ancient Greek morality lacks the critical thought necessary to attain substantive freedom. When Socrates engages his fellow citizens in critical thought by aiming quandaries at their assumed morality, he is executed for corrupting the youth. Ancient Athens also depends on slave labor, a practice even more obviously in violation of the principles of freedom. Thus, Ancient Greece contains contradictions that obstruct its society from achieving the ultimate freedom toward which Hegel believes thought is destined.

Following the demise of the Ancient Greek city-states, the Roman Empire rules Europe brutally until its own collapse. Under the coercive Roman system, subjects do not experience even the form of freedom that the citizens of Athens had. As a result, the impulse toward freedom cannot be channeled into the physical world but is expressed in the spiritual world. Christianity begins with a marked asceticism<sup>26</sup> but, due to political events, betrays its original philosophy with respect to power and worldliness. In the fourth century AD, this religion's spiritual escape from Rome's earthly power becomes co-opted by the tyrannical power of the latter when Constantine makes Christianity the

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<sup>26</sup> Ibid., 23-24. This concept about the origins of asceticism is similar to Nietzsche's. See Friedrich Nietzsche, *On the Genealogy of Morals*, revised ed. (New York: Oxford University Press USA, 1998).

official religion of the empire. Christianity ultimately participates in the kind of domineering materialism it once rejected in favor of asceticism.

For Hegel, the next major historical development is the Protestant Reformation (circa 1517-1648), which posits man's freedom of critical inquiry. The tradition passed down by the clergy is no longer to be trusted, and each person is to do his own thinking (just as Kant implores in 1784) and communicating with God. Hegel does not describe the development as a solely religious one. He instead views the centuries that follow the historic break, with what had been one dominant church into many denominations of Protestantism, as a working out of the political implications of the new independence of thought.<sup>27</sup> In Hegel's analysis, Reformation Europe constitutes the antithesis to Ancient Athens' thesis. As Peter Singer writes, "The harmony of Greek community has been lost, but freedom is triumphant."<sup>28</sup>

The new freedom implicit in the logic of the Reformation fails in practice, however, due to its own abstract and radical nature. Reason manifests itself in the form of the Terror of the French Revolution; abstractions lead to violence in their practical implementation.<sup>29</sup> Neither Athens nor Reformation Europe prove sustainable, as Singer writes: "[B]oth customary harmony and abstract freedom of the individual are one-sided. They must be brought together, unified in a manner that preserves them, and avoids their different forms of one-sidedness."<sup>30</sup> The thesis and the antithesis must be synthesized in a manner that resolves the contradictions in each. Though many of his followers disagree

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<sup>27</sup>These implications include critiques of slavery and monarchy. See *ibid.*, 25-28.

<sup>28</sup> *Ibid.*, 102.

<sup>29</sup> *Ibid.*, 28-31.

<sup>30</sup> *Ibid.*, 102.

with him, Hegel concludes that his own German society provides this final synthesis.<sup>31</sup>

Hegel's broad sweep through Western Civilization in the *Philosophy of History* demonstrates an application of the dialectic from which the following thinkers build.

Marx applies Hegel's concept to the material world, a theory sometimes called "dialectical materialism."<sup>32</sup> As a materialist, Marx thinks physical, and specifically economic, realities determine thoughts and understanding, whereas Hegel's entire *Philosophy of History* argues that ideas determine historical outcomes. Rather than history leading to rationality's self-awareness<sup>33</sup> and implementation into society, Marx envisions the dialectic culminating in the alleviation of physical exploitation and the end of inequality. His utopia will be achieved when the workers of the world take over the factors of production (institutionalized applications of Bacon's method), install a dictatorship of the proletariat, and equally distribute the fruits of humankind's domination of nature.<sup>34</sup> Just as Hegel's dialectic travels through Athens and Protestant Europe, so Marx's dialectic passes through various forms of economic exploitation such as slavery, feudalism, and wage labor under capitalism. Each form contains its own untenable contradictions. Before the rise of these economic systems, humans are entitled to the products, however meager, of their own labor (the thesis). Under these systems of increasing production, the stored wealth of labor and the power that inevitably comes with disproportionate wealth flows not to the workers but to their masters, whether overseers, nobles, or capitalists (the antithesis). For Marx, this *materialist* dialectic

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<sup>31</sup> The Young Hegelians claim Hegel sells out by affirming ultimate freedom in the Prussian state. See Peter Singer, *Marx: A Very Short Introduction* (Oxford: Oxford University Press, 2000), 20-21.

<sup>32</sup> *Ibid.*, 17. See also 16-22, 32-38.

<sup>33</sup> As in Hegel's *Phenomenology of Mind*. See *ibid.*, 60-96.

<sup>34</sup> Karl Marx, *The Communist Manifesto*, in *Selected Writings* ed. Lawrence H. Simon. (Indianapolis: Hackett Publishing Company, Inc., 1994), 175-176.



ultimately resolves with the synthesis of communism: Humankind's productive capacity is greatly increased by industrialization and that productivity benefits everyone.

Hegel's dialectic lays important groundwork for Marx, whose theory of communism shakes worlds, ideal and material. Though Marx's predicted dialectical resolution (communism) proves no more satisfying than Hegel's (early nineteenth century Prussia), his thought returns us to the two relationships considered by Bacon: the individual to society and humans to nature. As Marx writes in his *Economic and Philosophical Manuscripts of 1844*, "Communism ... is the genuine resolution of the antagonism between man and nature and between man and man."<sup>35</sup> For Marx, the intersection and interplay between the scientific and political realms play center stage as he contemplates the dialectical history of the human race. Translating Marx into Bacon's terms, the dominance of "those foundations which have relation to practice" over their "contemplative counterpart" is not ultimately a problem: The preferable elements of the two, equality and productive capacity, eventually synthesize into a communist world.

In the context of Bacon, Hegel, and Marx, Horkheimer and Adorno's critique of enlightenment's inner tension, *Dialectic of Enlightenment* (originally published in 1947), continues the conversation about the two interrelated modern rationalities: natural and social. Analyzing the murderous and repressive use of rationality in the shadow of World War Two, the two Frankfurt School theorists conclude, "Enlightenment is totalitarian."<sup>36</sup> With this polemical statement, the authors shed the optimism that characterizes Hegel's and Marx's dialectics as well as the visions of progress dreamt by Bacon and Condorcet. Some readers, including the foremost student of the two authors, Jürgen Habermas,

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<sup>35</sup> Quoted in Singer, *Marx*, 37.

<sup>36</sup> Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment* (New York: Herder and Herder, 1969), 6.

interpret the book as ultimately fatalistic with respect to the liberating potential of rationality. Habermas calls *Dialectic of Enlightenment* Horkheimer and Adorno's "blackest, most nihilistic book."<sup>37</sup> The text is certainly littered with phrases and arguments that make modern violence and oppression seem inescapable: "What men want to learn from nature is how to use it in order wholly to dominate it and other men;"<sup>38</sup> "Misery ... grows immeasurably, together with the capacity to remove all misery permanently."<sup>39</sup> The implication of the first quotation is ominous given humankind's contemporary level and processes of learning; tyrannical power grows with that knowledge. The second quote, when taken in light of the implications of the first, suggests misery will continue to grow immeasurably in the modern world.

David Held disagrees, however, with Habermas's pessimistic reading of *Dialectic of Enlightenment*. He writes, "[T]he implied notion in the *Dialectic* of a *reconciliation* between humankind and nature, leaves open the possibility of a fully liberating reason."<sup>40</sup> Held perceives *Dialectic of Enlightenment* leaving a window open via the distinction between critical and instrumental rationality.<sup>41</sup> Indeed, Horkheimer and Adorno argue in the introduction that "the Enlightenment must consider itself, if men are not to be wholly betrayed,"<sup>42</sup> suggesting other, more humane possibilities for rationality. Horkheimer and Adorno allow that men might not be betrayed by enlightenment, though they find having optimism about rationality understandably difficult given its crucial role in the horrors of

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<sup>37</sup> Habermas, Jürgen, "The Entwinement of Myth and Enlightenment: Re-Reading *Dialectic of Enlightenment*," *New German Critique* 26 (Spring 1982): 13-30.

<sup>38</sup> Horkheimer and Adorno, 4. The phrase is not terribly different than Bacon's, but the tone and context in which it is stated are much darker.

<sup>39</sup> *Ibid.*, 38. Marx agrees with this, though for him, the conflict eventually resolves to the benefit of the majority under communism.

<sup>40</sup> David Held, *Introduction to Critical Theory* (Berkeley: University of California Press, 1980), 157; italics original.

<sup>41</sup> Especially when read in light of Horkheimer's *Eclipse of Reason*. See Held, 156-157.

<sup>42</sup> Horkheimer and Adorno, XV.

World War Two: the organization of the Nazi death camps, the atomic bomb, new forms of propaganda, and technological warfare generally.

Whatever Horkheimer and Adorno's level of hope, they add new elements to the discussion. In contrast to Bacon's original insight that the quest for knowledge springs from a positive desire for power, Held notes that Horkheimer and Adorno believe the desire for power emerges out of fear for survival: "Fear of the unknown in an environment which threatens survival is, according to Horkheimer and Adorno, the root of the desire to dominate nature and the basis of both ancient and modern systems of thought."<sup>43</sup> Power is not the end with knowledge as its means; rather alleviation of mortal fear is the end and knowledge (thereby power) is the means. This argument adds a twist to Bacon's more positive assumption about humankind's technological impulse and its true role in human existence.

Why does Held mention ancient "systems of thought" when it is the modern system of Bacon and beyond that seeks to dominate nature? As Bacon contrasts inductive reasoning to deductive reasoning, Horkheimer and Adorno contrast enlightenment to myth, but they do not believe that the two are opposites. Held writes, "Like science, myth and magic pursue objectives, but the way in which they do so are obviously not the same. The latter seek to achieve their goal by mimesis: the re-enactment in ritual of natural processes as an attempt to control and understand them."<sup>44</sup> Though magic seems ineffectual to us today, its motivation stems from the same inner place as the modern motivation for applied science: fear and the desire to ameliorate that fear by control. As technology is to science, so magic is to myth. Each tries to change the world for human

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<sup>43</sup> Held, 155.

<sup>44</sup> Ibid. See also Horkheimer and Adorno, 11.

purposes, just as myth and science both try to explain the world. For Horkheimer and Adorno, modern rationality is not a break from the ancient world or from pre-industrial cultures that rely on mythology but a new turn in the dialectic.

Viewed in this light, positivist social science, which the authors of *Dialectic of Enlightenment* take to task, is a paranoia more than an aspiration or an innocuous curiosity: “Although reason originated in the struggle to come to terms with nature, it turned ‘against the thinking subject.’”<sup>45</sup> Here the relationship between humans-nature rationality and individuals-society rationality takes a truly insidious turn. If the purpose of studying nature is to command it, as Bacon states, then the purpose of studying humans is to dominate them for fear of losing control.

Moreover, systematized study assumes a system. Repetition and predictability are prerequisites to rationality. When positivists apply empirical methodology to society, they implicitly assume they are studying a predictable and natural object. What they are studying in actuality, argue Horkheimer and Adorno, are created social conditions. By treating these conditions as objective and natural, positivists reify and affirm them; they ignore the normative implications of a dogmatic empiricism with society as its object of study. The social sciences, as distinct from the natural sciences, are therefore certain to remain conservative by nature of their logic: “The reduction of thought to a mathematical apparatus conceals the sanction of the world as its own yardstick. What appears to be the triumph of subjective rationality, the subjection of all reality to logical formalism, is paid for by the obedient subjection of reason to what is directly given.”<sup>46</sup> Horkheimer and Adorno lament, “Enlightenment has put aside the classic requirement of thinking about

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<sup>45</sup> Held, 155.

<sup>46</sup> Horkheimer and Adorno, 26.

thought.”<sup>47</sup> The authors understand their task of developing a critical theory as counterbalancing the positivists in addition to the devastating power of the unchecked application of systematized knowledge. They seek to challenge “what is directly given” and “think ... about thought.”

Habermas criticizes *Dialectic of Enlightenment* for being too pessimistic about the potential for rationality to liberate humankind. He adds nuance to Horkheimer and Adorno’s critique of instrumental reason but, more crucially, expounds on an alternative form of reason that he calls “communicative rationality,” which they called “critical rationality.” With communicative rationality, Habermas attempts to satisfy *Dialectic of Enlightenment*’s demand for “thinking about thought.” The concept of communicative rationality corresponds to what Dear refers to as *vita contemplativa* and what Bacon describes as a “contemplative counterpart” to action, just as instrumental rationality corresponds with *vita activa* or what Bacon called “those foundations which have relation to practice.”<sup>48</sup>

The functions of speech play an integral role for Habermas’s theory, from which he articulates an alternative, even prerequisite, rationality to the instrumental sort.<sup>49</sup> Communicative rationality precedes instrumental rationality in the following manner: Underlying the world of instrumental action is a social climate, or “lifeworld.” In the lifeworld, the undertaking in question (perhaps a specific technology or industry) is normatively sanctioned or in the very least permitted, and from there it develops along Baconian lines. Action spawns from discursive thought.

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<sup>47</sup> Ibid., 25.

<sup>48</sup> Francis Bacon, 149.

<sup>49</sup> James Gordon Finlayson, *Habermas: A Very Short Introduction* (Oxford: Oxford University Press, 2005), 28.

At the most basic level, as James Gordon Finlayson writes in *Habermas: A Very Short Introduction*, Habermas believes that the function of speech is to “bring interlocutors to a shared understanding and to establish intersubjective consensus”<sup>50</sup> from which organized action can then occur. When a listener accepts what another speaker is saying, the listener believes that the speaker can, if requested, offer him or her agreeable reasons to back up what is being said. Speakers know they need to use logic that others will be able to see. When a statement is challenged because its logic is unclear or disagreeable, “disrupted consensus” occurs.<sup>51</sup> The interlocutors then enter into discourse in an attempt to reestablish consensus, which may or may not result. Habermas sees the principles of that discourse to be consistency, sincerity, and the freedom of each speaker to introduce and question propositions; these criteria facilitate the process of reaching consensus.<sup>52</sup>

Habermas’s rules of discourse also characterize important principles of the Enlightenment and, thereby, modernity. He deals with this argument in *The Structural Transformation of the Public Sphere*. The author believes that the public sphere took its modern form in pre-Revolutionary France. He depicts it as a medium for interlocutors to engage in the above-described discourse on issues pertaining to the public. This form of open discourse occurred in the salons and by letter in Enlightenment-era France. This communicative and consensus-based rationality comprises what Habermas calls communicative action in his most famous work, the two-volume *Theory of Communicative Action*. Note the congruity between the reasoning in which a Habermasian listener engages when accepting or challenging statements by a speaker and

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<sup>50</sup> Ibid., 33.

<sup>51</sup> Ibid., 40-41.

<sup>52</sup> Ibid., 43.

Kant's exhortation to "[h]ave courage to use your own understanding!" Discursive statements imply a universality that can and, as Kant said, *should* be grasped by speaker and listener alike, using their "own understanding." Reasons for doing something ought to be seen as valid not only by the speaker or writer, but also by the listener or the reader. The Enlightenment champions the "non-coercive coercion of the better argument"<sup>53</sup> with the well-noted effect that authority and tradition, Kant's "guardians," no longer dictate what ought to be done in public matters.

Within a modern society, statements are made and accepted, or challenged, all the time. This discourse occurs in households, culture, media, and social organizations. Taken together, Habermas calls these relatively non-institutional spaces the "lifeworld." As Finlayson writes, "These unregulated spheres of sociality provide a repository of shared meanings and understandings and a social horizon for everyday encounters with other people."<sup>54</sup> In short, the lifeworld is where both contested and accepted ideas are born and circulate; it is the home of communicative rationality.

As communicative rationality is to the lifeworld, so instrumental rationality is to what Habermas calls the "system." Finlayson defines the system as "sedimented structures and established patterns of instrumental action," and counts money and power as the two sub-systems.<sup>55</sup> Finlayson also notes that Horkheimer and Adorno's critique of the unreflective state of enlightenment is aimed at what Habermas calls the system. The Nazis focused their instrumental rationality on the questions of *how* to exterminate the Jews and win the war, but Germans did not sufficiently challenge Hitler's *shoulds* with communicative rationality early on before it was too late. Modern weaponry generally

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<sup>53</sup> Habermas, "The Entwinement of Myth and Enlightenment," 14.

<sup>54</sup> Finlayson, 51-52.

<sup>55</sup> *Ibid.*, 53.

exemplifies humankind's ability to find the *how*, but the systems that produce atom bombs and bombers have left little room for societies to question whether these weapons *should* be made at all.

Habermas's added nuance to the dialectic of enlightenment is the lifeworld, a space to satisfy Horkheimer and Adorno's demand for "critical rationality" and "thinking about thought."<sup>56</sup> Habermas acknowledges the dangers of the system, which "steer[s] agents towards ends that are not related to understanding or consensus."<sup>57</sup> Habermas recognizes, however, that instrumental reason can be useful without being destructive and, in any event, cannot be abolished. Rather, it needs to be evaluated and re-evaluated through communicative rationality in the lifeworld.

Whereas Horkheimer and Adorno state, "Enlightenment is totalitarian," Habermas argues that it is only totalitarian insofar as the system "colonizes" the lifeworld. He traces this process from the middle of the nineteenth century to the mid twentieth century. He follows the manner in which corporate mass media "transmogrify" the dialogical society of letters into one-way "culture consumption." The early Enlightenment spaces for discourse change form, one might say from civic to economy of scale-style profit. As a result, the active, participatory element is lost. Once, people gathered to discuss public issues, now they sit relatively alone taking in the messages from television, radio and newspaper. Habermas writes, "Since the middle of the nineteenth century, the institutions that until then had ensured the coherence of the public as a critically debating entity have been weakened."<sup>58</sup> The weakening of critical debate contributes to the hellish world

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<sup>56</sup> Ibid., 54.

<sup>57</sup> Ibid., 55.

<sup>58</sup> Jürgen Habermas, *The Structural Transformation of the Public Sphere* (Cambridge, M.A.: The MIT Press, 1989), 162.



Horkheimer and Adorno describe. Structures of technological innovation proceed apace without a broader social assessment of the ends they seek or the effects they have.

For Habermas, the positive aspects of modernity can be retained and the negative ones can be changed; synthesis is possible. The path to achieving balance lies at the core of our fundamental social act: communication. Habermas argues that to return to *vita contemplativa*, we must step back from but not abandon the Baconian program and reason aloud to save reason itself from a system that, left to its own, does not serve humankind.

### Global Warming

We face today a new threat that touches on all of the above-described aspects and effects of rationality: global warming. The first effect is the phenomenon itself and its anthropogenic origins. In one respect, it seems incredible that humans could even be capable of altering the earth's temperature. Industrialization, a process wholly dependent upon the Baconian program, has made possible a much larger human population as well as increased the amount of greenhouse gasses in the earth's atmosphere.<sup>59</sup> Additional heat from the sun that would normally escape the atmosphere is being retained, a phenomenon that could increase the earth's temperature from 1.4 to 5.8 degrees Celsius in the coming century, depending on how much action industrial nations take now to curb their emissions.<sup>60</sup> Only Habermasian systems that institutionalize specific cases of

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<sup>59</sup>Intergovernmental Panel on Climate Change Working Group I, 2-5, 10-12. See also Al Gore: "Why is this happening? Because the relationship between humankind and the Earth has been utterly transformed. To begin with, we have quadrupled the population of our planet in the past hundred years. And secondly, the power of the technologies now at our disposal vastly magnifies the impact each individual can have on the natural world."

<sup>60</sup> Intergovernmental Panel on Climate Change Working Group II, 3.

instrumental rationality could cause anthropogenic global warming. Fossil fuels proved useful to humans and thus became integral to modern economies: They are mined and drilled, transported, and burnt on a massive scale. As Horkheimer and Adorno write, “reason itself has become a mere instrument of the all-inclusive economic apparatus.”<sup>61</sup> Until fairly recently, the lion’s share of rationality has focused on how best to exploit these resources rather than on examining the effects of exploitation. The instrumental practice of burning coal and oil made industrialization realizable; systematized (rationalized) mass extraction through mining combined with systematized transportation and burning made industrialization happen.

In one respect, environmental problems such as pollution and global warming complicate Bacon’s chief argument that “we cannot command nature except by obeying her.”<sup>62</sup> In Bacon’s terms, humans “obeyed” the laws of the energy stored in coal and oil and thereby “commanded” those resources. The twin backlash, however, of negative health effects from polluted air and water and eventual unlivable climate temperatures suggests that nature, in fact, has not been fully commanded. The particular goal of increasing energy supply is met by instrumentally exploiting key resources, but only at the expense of what might be the more general goal of acceptable living conditions. Bacon’s experimental method probes the particular; hence, it lends command only to the particular. When modern humans command the particular in the Baconian sense, they seldom consider the effects of their actions on general, broader environmental systems such as the atmosphere or the ecosystem. Not long into England’s industrialization, the conditions in cities like London, such as the air and water quality, deteriorated at great

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<sup>61</sup> Horkheimer and Adorno, 30.

<sup>62</sup> Francis Bacon, 147.

expense to the public. The conflict of interest between the industrialist's profit and the public concerns about pollution and quality of life was clear. The poet William Blake wrote of "these dark Satanic mills."

The cost of manipulating nature manifests itself not only in environmental degradation, but also in thought. For Bacon, humankind exchanges its time and resources for knowledge that can facilitate useful technology. For Horkheimer and Adorno, however, the token of exchange is not simply time and resources but also disenchantment;<sup>63</sup> instrumentally rational humans separate themselves from purely physical nature. When they probe nature for its usefulness to them, they forget the separation they have constructed between themselves and nature:

In thought, men distance themselves from nature in order thus imaginatively to present it to themselves—but only in order to determine how it is to be dominated. Like the thing ... the concept is the ideal tool, fit to do service for everything, wherever it can be applied. And so thought becomes illusionary whenever it seeks to deny the divisive function, distancing and objectification.<sup>64</sup>

When England industrialized, it appeared as though power from nature, in the form of coal, had moved from its natural realm into the separate realm of human use.<sup>65</sup> The separation of those realms, however, was "illusionary" once it was forgotten, employed dogmatically, and treated as a natural way of seeing the world. Despite the modern division between the human subject and the natural object (now so ingrained as to be invisible), nature is interconnected. It encompasses humans. When humans alter

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<sup>63</sup> Max Weber famously wrote of the Western "disenchantment with nature," wherein nature's intrinsic value (such as in animism) was lost.

<sup>64</sup> Horkheimer and Adorno, 39.

<sup>65</sup> In some respects, this idea draws from John Locke's labor theory of value, which states that humans create property by applying their labor to nature.

particular aspects of nature for their own use, they unwittingly alter nature more broadly, in all its interconnectivities.

Today's environmental problems highlight the flawed assumption, described by Horkheimer and Adorno, underlying Bacon's concept of "commanding" nature. A group of industrialists or a nation may very well use nature for their immediate gain, but the unpredictable broader effect for nearby residents or future generations can hardly be described as evidence of "command." The short-term human benefits of industrialization (energy, improved agricultural yields, and a more comfortable standard of living) were instantly clear, but humankind is still coming to terms with industrialization's long-term consequences. The consequences include not just modern warfare and oppression, the concerns of Horkheimer and Adorno, but toxins, greenhouse gasses, and a larger world population.<sup>66</sup> Bacon's categorical claim that "[d]iscoveries carry blessings with them, and confer benefits without causing harm or sorrow to any"<sup>67</sup> has been duly refuted. It remains to be seen, however, whether the net human utility of rationalized, systematized technology will be positive or negative. Command is a double-edged sword, often as oblivious to the general as it is effective on the particular. Whereas *Dialectic of Enlightenment* ponders the wielders and victims of command, global warming begs the question of command's unintended consequences.

The next intersection to be addressed between enlightenment and global warming is the empirical discovery that modern human processes raise the temperature of the earth. How does humankind become aware of the considerable print it has made on the earth and what that print means for the future? Only science can identify the problem,

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<sup>66</sup> In addition to pollution and climate change, one might also include the dependency of large populations on finite resources, being that oil and coal are basically buried pockets of the sun's stored energy.

<sup>67</sup> Bacon, 146.

despite, one might say, instrumental science itself being implicitly on trial. Without systematized, disenchanting knowledge of the world, the considerable energy from fossil fuels would never have been tapped and human population could never have grown as exponentially as it has,<sup>68</sup> nor could we ever become aware of any of this. The level of learning and division of labor necessary to evaluate global warming is, of course, considerable. The task of measuring the average temperature of the entire earth's surface atmosphere, let alone attributing causes of increase, would have been unimaginable in Bacon's time. Carried to its logical conclusion, however, his method would ultimately provide the phenomenon as well as the tools for probing it.

An additional word is in order about the Habermasian concept of the system. Bacon's experimental method allows humans to understand climate change, but academia, private sector research and development, and government science grants enable the system to be effective. There is always a sense in which the normative underwrites the empirical in the form of funding; scientists need incentive and support to research any phenomenon as complicated and on so large a scale as global warming. Do institutions of funding and legitimacy think research about a given phenomenon, such as global warming, *should* be supported? The method is not enough; in order for phenomena to be discovered and understood, an adequate scholarly system must be in place, and resources need to be allocated according to priority. This reality supports Habermas's position, that systems are necessary and can be of use to humankind.

Quite aside from the empirical question of global warming's existence and extent is the wide range of normative questions the phenomenon implies. This point returns to

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<sup>68</sup> Land use changes also contribute to global warming, changes not unrelated to the population boom of the last two and a half centuries, made possible by modernization.

the crucial quandary in the dialectic of enlightenment: Modern science and technology greatly expand the realm of undertakings humankind can figure out *how* to do, but modernity tells us nothing about what we *should* undertake. *Should* we stop and/or drastically alter the systems we have functioning today for the sake of the people of tomorrow? Mustering a meaningful “yes” in response to the question means changing deeply entrenched patterns of behavior. Systems make the reevaluation of broad (often institutionalized) social phenomena difficult. Entire industries, which are deeply rooted and unlikely to volunteer their own demise, exist because of the profitability of methods of electricity generation and transportation that pump carbon dioxide, the leading gas that contributes to global warming, into the atmosphere.<sup>69</sup> The same is true of the incredible number of cattle and livestock that industrial animal agriculture has created; these animals emit significant amounts of methane. How is the U.S. supposed to reform these systems to a degree that will make a difference in greenhouse gas emission? The solution pursued by countries that signed on to the Kyoto Protocol is for the government to limit the emissions of pertinent industries, such as electricity providers, car manufacturers, and certain agriculturalists.

A step back needs to be taken, however. What of the dissemination of climate scientists’ findings? Due to global warming’s incredible implications for the future, establishing its empirical existence and anthropogenic causes has become a unique challenge in the U.S., where major players in the greenhouse-gas-emitting system stand to lose a great deal. These vested interests take the battle for their *system* of profit into the

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<sup>69</sup>Intergovernmental Panel on Climate Change Working Group I, 2. Carbon is emitted by both coal power plants and automobiles.

*lifeworld*, a process Habermas describes as “colonization” of the lifeworld.<sup>70</sup> The most obvious manifestation of this colonization is the “debate” about global warming that continued to rage in the U.S. even after other nations began to take action on the issue by committing to the Kyoto Protocol’s emission reductions. In American discourse, the majority of climate scientists and the Nobel Prize Winning Intergovernmental Panel on Climate Change have not had the final, conclusive, or even authoritative word as to global warming’s reality or severity. Rather, in a misuse of communicative action, vested interests such as oil companies have funded think tanks to produce scientific-sounding studies to contradict and obfuscate the overarching message of the scientific community’s findings.<sup>71</sup> The interests of those “commanding” nature in environmentally deleterious ways are so entrenched in the American system that these elements of the system refuse to give up their short-term gains without a fight. As such, “[t]he skeptics want every uncertainty nailed down before any action is taken.”<sup>72</sup> In this situation, the goal of discourse is no longer consensus, as in Habermas’s ideal, but verbal confusion sufficient to preclude substantially altering the system presently in action. The lifeworld, where discourse reflects on the world, has become an arm of the system, politicizing and polarizing empirical claims that, stripped of their implications, are simply that: empirical.

Even without the disingenuous claims of vested interests, the process of establishing scientific realities poses a complicated problem for enlightened politics. How

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<sup>70</sup> Jürgen Habermas, *The Theory of Communicative Action: Lifeworld and System: A Critique of Functionalist Reason* (Boston: Beacon Press, 1987), 318-331.

<sup>71</sup>For example, the Competitive Enterprise Institute, whose employees travel the country trying to refute Al Gore’s *An Inconvenient Truth*, has received support from Alliance of Automobile Manufacturers, Exxon Mobil, the Pharmaceutical Research and Manufacturers of America, Pfizer, General Motors, the American Petroleum Institute, the American Plastics Council, the Chlorine Chemistry Council and Arch Coal. See Joel Achenbach, “The Tempest,” *Washington Post Magazine* (May 28, 2006, accessed January 21, 2008); available from

<http://www.washingtonpost.com/wp-dyn/content/article/2006/05/23/AR2006052301305.html>

<sup>72</sup> Achenbach.

is the average person supposed to evaluate complex scientific claims? Kant writes that people ought to reason “without guidance from another.” Is that even a realistic maxim for climate scientists? Although the scientific community works according to the principles of the scientific method, individual scientists must ultimately rely on the work, i.e. empirical claims, of others. No individual scientist could gather and evaluate all the pertinent data about global warming on his or her own. Temperatures are being recorded and monitored everyday all over the world. Though modern science is based on the replicable outcomes of experiments, it is not practical or even possible that each scientist challenge all empirical claims until they are each confirmed individually. The advancement of scientific learning has surpassed even the level of which Bacon dreamed, and because knowledge is now so accumulated, the product of so many thousands of lifetimes of intellectual work, it must be broken down and specialized. One person can no longer learn it all in his or her lifetime, as arguably was the case centuries ago. Though modern knowledge has the systems of tenure, funding, and peer review, and though it is based on the principles of the scientific method, it must now functionally be reduced to trust in others, however anathema that concept is to the Enlightenment. Citizens who are not scientists, or even citizens who are scientists but not specialists in climate change, must at some point rely on the findings of others and trust that the people studying global warming are adhering to the scientific method. This is not to say that global warming is not a real phenomenon, but rather that our knowledge about global warming’s reality cannot be arrived at individually, in Kant’s words, “without guidance from another.”

Global warming is not the first issue to raise the question of how specialized (in some cases “technocratic”) knowledge is to be dealt with in enlightened politics. Walter



Lippmann, for example, writes during the early twentieth century that modern society is so complicated that the average citizen cannot realistically be expected to comprehend it, and therefore requires elites with specialized knowledge.<sup>73</sup> Though Lippmann's assertion circumvents the process of discourse Habermas describes, and perhaps violates a basic, Kantian principle of the Enlightenment, global warming forces us to revisit the question of who decides.

Ideally, citizens in the American political system use their knowledge and interpretation of public affairs to vote for representatives who give the citizens' interests and principles voice in policy. Though future generations will be greatly affected by today's environmental choices, they have no direct input into these choices. It is therefore incumbent, one could argue, upon today's voters to guard the interests of those who are not yet born but who will be forced to adapt to a warmer climate and everything that entails. Despite the stark predictions of climatologists, however, the U.S. has moved notably slower to action than its industrialized counterparts. While oil-funded think tanks colonized public discourse to delay voter action, equally egregious in terms of Enlightenment principles has been the conduct of those already in government. Senator James Inhofe from Oklahoma called global warming "the greatest hoax ever perpetuated on the American people," and later defended and expanded upon his statement.<sup>74</sup> The Bush administration edited scientific reports that seriously challenged present systems.<sup>75</sup> Those in the U.S. pushing for action about global warming would be well served by a comparative examination of what makes the country politically different from its peer

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<sup>73</sup> See Walter Lippmann, *Public Opinion* (1920) and *The Phantom Public* (1927).

<sup>74</sup> James Inhofe, "Climate Change Update," 4 January, 2005. Available from <http://inhofe.senate.gov/pressreleases/climateupdate.htm>.

<sup>75</sup> Andrew Revkin, "Bush Aide Edited Climate Reports," *New York Times* 8 June, 2005, available <http://query.nytimes.com/gst/fullpage.html?res=9E0DE1D71338F93BA35755C0A9639C8B63>.

countries that are taking the problem seriously at the governmental level. What is the state of the lifeworld in those countries, and how are popular consensuses transferred into leadership and policy? Are greenhouse gas-emitting industries intent on and able to manipulate policy against consensus by using propaganda and governmental positions? What are the levels of public awareness about climate change on empirical issues, and what do people think needs to be done, if anything? A CBS/New York Times poll from April 2007 found that 52 percent of Americans thought global warming should be a “high priority” for government, with an additional 37 percent believing it to be a “serious problem” but not a high priority. Also, 78 percent thought it necessary to take steps “right away” to counter global warming.<sup>76</sup> The American lifeworld shows signs of concern, even in spite of some disingenuous discourse, yet the federal system is yet to respond meaningfully.

### Conclusion

Enlightenment made anthropogenic global warming possible, and it seems now that only enlightenment can avert the large scale disaster it threatens to cause. The rationality required now, however, is different than the rationality that discovered and systematized the use of fossil fuels. It is true that ingenuity and a certain kind of command of nature will still be necessary to abate the heating of the atmosphere, but most importantly for the U.S. is the rationality that debates and decides rather than the rationality that invents. Technical innovation rarely lacks in the U.S., but the riddle of overcoming entrenched interests remains to be solved. To expect environmentalists to

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<sup>76</sup> CBS/New York Times, “Americans’ views on the environment,” 26 April, 2007. Available from <http://www.cbsnews.com/stories/2007/04/26/opinion/polls/main2731709.shtml>.

win the lobbyist battle against the status quo is unrealistic; popular pressure needs to be exerted at the ballot box. Prerequisite to that pressure is enlightened discourse. “All it takes is the political will,” according to Al Gore, but the phrase entails more than winning the majority opinion. Is the electorate sufficiently educated and informed? It is being presented with the evidence of global warming and is it able to ask the many important questions of experts? Is it drawing its conclusions based on Enlightenment principles of rational discourse? Can and do people winnow out the noise made by those who wish to obfuscate the empirical? Once grasping the gravity of climate change, is the political system conducive to the political lifeworld? Is it as easy as it should be to dethrone incumbent politicians when necessary? The questions about what Habermas would call the ideal speech situation, where enlightened communicative rationality is the rule, are many. Questions, after all, spur dialogue and are essential to counter lifeworld-colonizing systems that sidestep discursive challenges. The overarching point is whether the lifeworld is sufficiently free from the system. If it is not, narrow interests will continue to frame human activity at great cost to the many, living and yet to be living.

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