

The rhetoric of climate change: Using Latour to compose a nonmodern approach to our modern  
climate crisis

by

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Climate change is the greatest threat facing humanity in the 21<sup>st</sup> century. Scientists from a variety of specialized fields, from biology and chemistry, to climatology and geology, are currently conducting research to understand and respond to the wide range of complex, global effects that are likely to occur as we pump more and more greenhouse gases into the atmosphere and the planet's surface temperature continues to rise. Despite efforts by the global scientific community, there is still a crucial element missing to fully understand this phenomenon known as climate change. Scholars and researchers outside of the "hard" sciences ask us to dispute this notion that climate change should be left to the scientists because, in addition to the physical effects, "climate change is an idea as well as an empirical reality" (Fiskio, p. 1). Many argue that climate change, and all scientific topics and inquiry, belong partially to the realm of the social and the rhetorical—shaped by language and understanding. Because scientific and technical lenses have only been able to achieve a partial view of climate change, and because climate change manifests important characteristics more suited to a sociomaterial perspective, rhetorical analysis has become an important tool to bring to bear upon

climate change. Of particular note, the work of sociologist Bruno Latour is useful in exploring the sociomaterial nature of such complex, global phenomena as climate change, and in articulating new methods of problem solving. Using Latour's concepts of hybrid phenomena, the agency of nonhuman actants, matters of fact and concern, and the analytical framework provided by Actor-Network Theory (ANT), this dissertation questions some of the foundational assumptions of our current technical, public, and political responses to climate change, all of which, Latour argues, stem from the Modernist divide between the social and the natural. This dissertation illustrates how a rhetorical understanding of climate change provides a more complete toolset for grappling with this truly global issue, for life in our new geological epoch known as the Anthropocene, and for considering how the ways we communicate and think about climate change are as important as the "brute facts" of science (Gross, 1996).



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Doctor of Philosophy in Rhetoric, Writing, and Professional Communication

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# Chapter 1: Introduction and Analytical Framework

## INTRODUCTION

Climate change is the greatest threat facing humanity in the 21<sup>st</sup> century. Scientists from a variety of specialized fields, from biology and chemistry, to climatology and geology, are currently conducting research to understand and respond to the wide range of complex, global effects that are likely to occur as we pump more and more greenhouse gases into the atmosphere and the planet's surface temperature continues to rise. Despite efforts by the global scientific community, there is still a crucial element missing to fully understand this phenomenon known as climate change—that which moves beyond the physiological effects. The empirical evidence is difficult to ignore as people around the world encounter warmer temperatures, severe droughts, raging wildfires, the bleaching of coral reefs, loss of biodiversity, a marked increase in the amount and severity of tropical storms, and many other effects.

But does this make climate change solely a scientific, technical phenomenon? Scholars and researchers outside of the “hard” sciences ask us to dispute this notion that climate change should be left to the scientists because, in addition to its physical effects, “climate change is an idea as well as an empirical reality” (Fiskio, p. 1). Many argue that climate change, and all scientific topics and inquiry, belong partially to the realm of the social and the rhetorical—shaped by language and understanding. Because scientific and technical lenses have only been able to achieve a partial view

of climate change, and because climate change manifests important characteristics more suited to a sociomaterial perspective, rhetorical analysis has become an important tool to bring to bear upon climate change.

Of particular note, the work of sociologist Bruno Latour is useful in exploring the sociomaterial nature of complex, global phenomena, such as climate change, and in articulating new methods of problem solving. Using Latour's concepts of hybrid phenomena, the agency of nonhuman actants, matters of fact and concern, and the analytical framework provided by Actor-Network Theory (ANT), this dissertation questions some of the foundational assumptions of our current technical, public, and political responses to climate change, all of which, Latour argues, stem from the Modernist divide between the social and the natural. This dissertation illustrates how a rhetorical understanding of climate change provides a more complete toolset for grappling with life in our new geological epoch, known as the Anthropocene, and considers how the ways we communicate and think about climate change are as important as the "brute facts" of a scientific analysis (Gross, 1996).

This dissertation employs three analytical chapters, each of which uses a Latourian approach to rhetorical analysis, to explore the role of language and discourse in the sociomaterial construction of climate change and to examine how a new method of problem solving may provide insight into the root causes of our current climate crisis. My research asks: how would the contemporary story of climate change look different if we reexamine its rhetorical traces, manifested through language and discourse, in terms of sociomaterial phenomena, nonhuman agency, and "matters of concern"?

In this chapter, I provide an overview of the themes, context, and arguments essential for the development of my research. First, I place us in the Anthropocene, our current geological epoch, in which human activity has fundamentally shaped geological processes and introduced climate change as the primary exigence for this project. I then trace the emergence of the rhetoric of science as a field of scholarly inquiry and place the philosophy of Bruno Latour within this scholarly tradition. Finally, I outline the analytical chapters of this dissertation.

## THE ANTHROPOCENE

Welcome to the Anthropocene. Here we are in a new geological epoch, which, unlike epochs of the past, is distinguished by the effects of human activity. Scholars debate over when the Anthropocene began, what to call it, or if it even exists at all. However, despite the debate, most scientists, scholars, and critical thinkers agree with the fundamental fact that human activity (through land use change, changing composition of the atmosphere, or massive biodiversity loss) has shaped the environment and climate of our day.

One of the earliest articulations of this human-induced geological epoch came from the French naturalist Georges-Louis Leclerc, Comte de Buffon. In *Epochs of Nature*, Buffon divides the entire geological history of Earth into seven epochs. In the seventh and final epoch, he hypothesizes that we are entering an era remarkably shaped by human actions.

Man can have an influence on the climate he inhabits, and, in a manner, fix its temperature at any point that may be agreeable to him; and, what is singular, it is more difficult for him to cool than to heat the earth. (Buffon, 1778)

In 1922, Aleksei Pavlov, a Russian geologist, “described the present day as part of an ‘Anthropogenic system (period) or Anthropocene,’” the first use of the term (Lewis & Maslin, p. 173). However, it wouldn’t be until the turn of that century that the word entered the popular lexicon. In the International Geosphere-Biosphere Programme (IGBP), Crutzen and Stoermer detail various human-induced changes on the environment, including:

- Population growth: “during the past 3 centuries human population increased tenfold to 6000 million.”
- Burning fossil fuels: “The release of SO<sub>2</sub>, globally about 160 Tg/year to the atmosphere by coal and oil burning.”
- Global warming: “greenhouse gases have substantially increased in the atmosphere: CO<sub>2</sub> by more than 30% and CH<sub>4</sub> by even more than 100%.”
- Species extinction: “extinction rate by thousand to ten thousand fold in the tropical rain forests.”
- Loss of wetlands: “the loss of 50% of the world’s mangroves.”

In consideration of this widespread and global impact, they suggest that “it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use

the term ‘Anthropocene’ for the current geological epoch” (Crutzen & Stoermer, p. 17). In 2010, the President of the Geological Society of London declared that “the time in which we now live would then, sadly and justly, surely become known as the Anthropocene” (Lovell, p. 196).

In addition to the debate over what to call this new geological epoch, scholars and scientists debate when this era officially began. A majority believe the Anthropocene was sparked by Europe’s Industrial Revolution, around the 1800’s, when a shift to fossil fuels and factories led to greenhouse gas emissions and population growth (Steffen, et al., 2011). Some scholars, however, claim that the Anthropocene began far earlier in human history, during the Agricultural Revolution, when “forest clearance caused much greater preindustrial greenhouse-gas emissions and global temperature changes” (Ruddiman, p. 45). Still others believe that, while the Anthropocene may have begun in the 1800’s, it was the Great Acceleration, following World War II, that led to the rampant rise in carbon dioxide emissions, synthetic chemicals, and even more population growth.

All these dates fail to answer one underlying question: whose Anthropocene is it? The *Anthro-* prefix implies all humanity, but some scholars note the imbalance between the Global North and the Global South in causing climate change and ushering in this new epoch. Agarwal and Narain note how “the advanced capitalist countries or the ‘North’ composed 18.8% of the world population, but were responsible for 72.7 [percent] of the CO<sub>2</sub> emitted since 1850” (1991). In an attempt to synthesize these viewpoints, Chakrabarty argues for a pluralistic Anthropocene, claiming that if the Anthropocene is to be seen “as a measure of humans’ impact on the planet, [it] can have only plural beginnings and must remain an informal rather than a formal category of geology, capable of bearing multiple stories about human institutions and morality” (p. 20).

Regardless of when the Anthropocene may have begun or who is to blame, it is difficult to deny the importance of this neologism for our current day, representing a world indelibly shaped by the expansive reach of human growth and technology. Just as volcanic eruptions, asteroid impacts, or glacial expansions have carved out biospheres of the past, the condition of all biological life on the planet is now directly affected by the activities of humankind, of us. Perhaps the most significant effect of this human activity is global climate change. As the surface temperature of the Earth continuously increases, we are left to confront how we have changed the environment. Climate change, while perhaps the greatest existential threat to all life on the planet, also serves as a paradigmatic example of a sociomaterial phenomenon, of when the seemingly distinct realms of the natural and the social combine, forcing us to reevaluate our relationship with the world.

## CLIMATE CHANGE

Similar to the Anthropocene, scientists and scholars debate the exact beginning date for global climate change. Humans have reshaped the composition of our environment since the inception of fire, and more so, the development of agriculture, as land was repurposed and livestock grew in numbers. However, many agree that the story of climate change could begin in the 18<sup>th</sup> century with the invention of the steam engine, seen as the first of many key inventions that helped “pave the way for the Industrial Revolution and industrial scale use of coal” (BBC, 2013). In 1781, James Watt revealed his sun and planet gear steam engine (improved from Thomas Newcomen’s 1812 model), which quickly began replacing horses at mills and gave us the measurement of horsepower (Lira, 2013).



The steam engine, in addition to several other inventions, including the cotton gin, the telegraph, gas lighting, concrete, and the modern battery, sparked the Industrial Revolution. Originating in Great Britain, the revolution spread across Europe and the Atlantic to the United States. Here we have, for the first time in human history, the concept of exponential growth, and with it, unforeseen luxuries and advancements in human health. Populations boomed as agrarian societies developed into industrial ones. According to the United Nations, world population reached one billion around 1800, on the heels of the Industrial Revolution (2015). By 1927, this number doubled, an unprecedented increase, and even today we are a part of this rapid growth sparked by the Industrial Revolution (2015). By 2050, the UN projects the world population to reach 9.7 billion (United Nations Development, 2015).

The needs of this growing population were met by the tools and inventions of the Industrial Revolution. Agrarian, animal-powered energy systems quickly became replaced by much more efficient methods, such as the steam engine, the spinning jenny, the locomotive, and the electrical generator. To power these new machines, a fuel source beyond animal, human, or biomass (primarily wood) energy was desperately needed. Enter fossil fuels.

There is a strong argument to be made for the connection between the size and accessibility of Great Britain's coal reserves and the beginning of the Industrial Revolution. Spear notes that "it was estimated that Great Britain produced five times as much coal as the rest of the world by 1650 with annual production of around 3 million tons in 1700, with 500,000 tons of it used in London alone" (p. 85). This cheap source of energy fueled innovation and the rise of factories, which, as a positive feedback loop, fueled even more technological advancements and an increasing population working

in more factories in larger cities. Estimates suggest that the population of Great Britain doubled between 1750 and 1850 (Wilde, 2018).

Industrialization spread across Europe and the United States. Just like in Great Britain, technologies advanced, fossil fuels were burned, and populations grew and became increasingly urbanized. While the Industrial Revolution ushered in booming populations, an increase in life expectancy, and unforeseen luxuries, the means of production for this era of prosperity have led to environmental consequences that those of the 19<sup>th</sup> century could never have predicted. Factories and locomotives burned more and more coal, and when Edison opened the first electrical generating plant in 1882, “there were over 18 million lightbulbs in use in the U.S. alone” (Environmental Literacy Council). The market for coal continued to grow. However, despite this increase in the burning of coal, the 19<sup>th</sup> century had little use for oil—that is, until the invention of the automobile. From 1900 to 1923, the number of registered automobiles rose from 8,000 to 23 million (Environmental Literacy Council). A massive market for petroleum developed, in terms of world history, practically overnight.

When fossil fuels, such as coal and oil are burned, gas molecules escape into the atmosphere. These gas molecules, including carbon dioxide and methane, exist naturally in the environment and upper atmosphere, and in fact, are essential for the existence of organic life on our planet. These molecules, in addition to water vapor, ozone, and nitrous oxide, are called greenhouse gases because they absorb radiant energy, trapping the heat and ensuring a relatively warm climate. According to the Goddard Institute, “without naturally occurring greenhouse gases, Earth's average temperature

would be near 0°F (or -18°C) instead of the much warmer 59°F (15°C)” (Ma, 1998). Without greenhouse gases, life on Earth could not exist.

However, just as damaging as a deficiency would be, a surplus of these gases in the atmosphere is also problematic. According to the University Corporation for Atmospheric Research, at the start of the Industrial Revolution, there were 270 parts per million (ppm) of carbon dioxide in the atmosphere (UCAR, 2011). Now, we live under an atmosphere with 400 ppm of carbon dioxide (2011). This is no minor increase. What humanity has done is to overload the amount of carbon dioxide in the upper atmosphere and disrupt one of the planet’s largest and most complex natural cycles, and as we are just now beginning to realize, the effects are dramatic and global.

Since the Industrial Revolution, the average surface temperature of the planet has “risen about 1.62 degrees Fahrenheit ... a change driven largely by increased carbon dioxide and other human-made emissions into the atmosphere” (NASA). At the turn of the century, this trend has only accelerated. The first twelve years of the 21st century were the hottest years ever recorded in North America, and in 2012, the United States experienced its warmest recorded year based on average daily temperatures (Leonhardt, 2012). This rise in global surface temperatures has led to a litany of environmental consequences. According to NASA:

- The oceans have warmed by 0.302 degrees F
- Greenland lost 281 billion tons of ice per year between 1993 and 2016
- Global sea levels rose an average of eight inches

- Global increase in extreme weather events
- The Arctic Ocean is expected to become essentially ice free in summer before mid-century

In response to these widespread, complex effects, scientists from a wide range of specialized fields have worked toward understanding and predicting what our lives may be like on a warmer planet. From climatologists, biologists, chemists, to atmospheric scientists, the global nature of this phenomenon has required a global response—unlike anything the scientific community has seen before. However, even with the cooperation and collaboration of scientific communities across the globe, the response remains insufficient because it often fails to incorporate an important dynamic: the social.

To expand the study and analysis of climate change to the humanities and social sciences, it is essential, first, to understand the rhetorical nature of science. If science is truly and only an objective, empirical assessment of the natural world, a mapping of its inner machinations, then there is little room for rhetoric or human subjectivity. However, if we believe that science, like other methods of human inquiry, is in some way shaped, guided, and informed by the human perspective, then it is fair game for rhetorical analysis. Then, we can begin to reunite philosophy with science, which, in its earliest Greek inception, was referred to as natural philosophy.

## THE RHETORIC OF SCIENCE

In this section, I briefly trace some of the foundational theories and scholars that inform how my research on climate change uses the field of the rhetoric of science. In no way is this summary meant

to be entirely comprehensive or inclusive; rather, it is intended to connect some of the theoretical dots that undergird this project.

At its core, this project rests on the condition that science, as a method of human inquiry and a means of knowledge production, is rhetorical in nature. As such, science can be analyzed as a human endeavor, which, like all human endeavors (such as art, war, or politics) is at least partially subjectively and socially constructed. As Gross indicates in 1990:

science may be progressively revealed not as a privileged route to certain knowledge but as another intellectual enterprise, an activity that takes its place beside, not above, philosophy, literary criticism, history, and rhetoric itself. (p. 3)

From this condition, science must relinquish its hold on objective truth, its version of Platonic idealism. The practice of modern, Western science, while strengthened by its empirical reliability, becomes complex, and perhaps even unreliable, when viewed through a rhetorical framework. As Crick argues, with a rhetorical understanding of science:

truths are not so much discovered as fought over, that the caretakers of knowledge in any age are bound up with structures of power and authority, and that the scientific community often accepts arguments in the short term (or even the long-term) for reasons other than pure rationality. (p. 7)

Yet, according to Gross, in his 2006 follow-up to *The Rhetoric of Science*, “none of this suggests that science is *only* rhetoric; no sane person could reach so bizarre a conclusion” (p. 78). No amount of persuasion or discourse could prevent a rock thrown into the sky from returning to the ground. No rhetorical strategy or technique could alter the progression of the seasons. But for Gross, none of this is relevant because these “brute facts” do not constitute the concepts we deem science or knowledge (1990, p. 4). No one can deny these physical facts, and thus, they “themselves mean nothing; only statements have meaning, and of the truth of statements we must be persuaded” (p. 4). Thus, science is separated from the “brute facts” of reality, although closely intertwined. This paradox invokes the classic riddle: if a tree falls in the forest and no one is around to hear it, does it make a sound? Some of the most foundational debates in the rhetoric of science stem from this seemingly innocuous riddle. Does reality exist without human interpretation? Does language constitute knowledge or simply adorn it? (Baake, 2003). Gross, in a sense, splits the difference: yes, the tree still makes a sound, but outside of human sense experience, outside of earshot, it simply doesn’t matter.

The rhetoric of science emerged as a field of scholarly inquiry in the 20<sup>th</sup> century in response to a world increasingly shaped and driven by scientific knowledge and discoveries. Following the European Enlightenment of the 18<sup>th</sup> century, science and rationality overtook religion as the primary means for acquiring truth about the world. At the time of the Enlightenment, Aristotle’s original systems of logic and rhetoric were still in use. An Aristotelian framework, according to Harris, helped to “anchor the core empirical and formal enterprises that now wear the term science so comfortably” by advocating for the possibility of direct access to an objective world (p. 1). Francis

Bacon crafted his philosophy of science from Aristotle's logic in *Novum Organum* (1620), and in the 18<sup>th</sup> century, Newton solidified the scientific method, claiming that all knowledge stems from observable phenomena (1687). The science of the Enlightenment, as compared to that of the past, gradually became founded on empirical observation and evidence. Truth, it turned out, was no longer a metaphysical, spiritual quest, but one that could be measured and recorded. And as inventions, such as Boyle's air pump and Watt's steam engine, drove economic progress throughout Europe during the Industrial Revolution, technology and science became intertwined.

Throughout the 20<sup>th</sup> century, the scientific method developed into a powerful method of inquiry, developing from Antiquity, when philosophers like Plato and Gorgias clashed over debates of truth and persuasion. While Plato believed in the ideal of an objective truth, Gorgias believed truth was in fact crafted by persuasion. This Sophistic tradition can be seen reflected in the rhetoric of science as it developed in the latter half of the 20<sup>th</sup> century, as scholars began to examine the social aspects of science work and the production of scientific knowledge. This work, the rhetorical study of science, emerged as a response to the overwhelming power and confidence in the progress of science. Rather than understanding science as an empirical project toward unveiling objective truths about the world, early rhetoric of science scholars sought to shine a light on the very human nature of this method of inquiry. Much like the analyses of history, art, rhetoric, and communication, the sciences were in line for a critical, social-constructivist critique.

The origins of the rhetoric of science can be traced to Kuhn's *The Structure of Scientific Revolutions* (1962). Kuhn is concerned with examining the historical development of science, indicating two main tasks of the project: first, that he "must determine by what man and at what point in time each

contemporary scientific fact, law, and theory was discovered or invented,” and secondly, that he “must describe and explain the congeries of error, myth, and superstition that have inhibited the more rapid accumulation of the constituents of the modern science text” (p. 2). By historicizing the accumulation and development of scientific knowledge, Kuhn is able to assess the very *human* nature of science and reveal how scientific work rarely progresses in a linear, orderly manner. Through the analysis of several case studies, including the discovery of oxygen, x-rays, and Copernican astronomy, Kuhn argues that science can only advance through revolutions, or paradigm shifts, which radically reshape the reality and our understanding of the world (1962). Kuhn explores how these scientific revolutions function in very similar ways to political ones inherently rhetorical, persuasive, and driven by dynamics of power and people.

In “Rereading Aristotle’s Rhetoric,” Gross and Walzer echo Alfred North Whitehead’s claim that nearly all Western philosophy “is but a series of responses to issues raised by that central work” of Aristotle’s *Rhetoric* (p. ix). Similarly, one could make the case that nearly all scholarship within the rhetoric of science is in response to Kuhn. Following in his steps, scholars and researchers explored various dimensions of the social nature of science work and knowledge. Feyerabend’s *Against Method* critiques the dominance and success of the scientific method, advocating for a more diverse and democratic approach to the practice of science (1975). Feyerabend critiques the blind support given to the scientific method, arguing that “science is an essentially anarchic enterprise” and that, theoretically, “the only principle that does not inhibit progress is: anything goes” (p. 7). Latour and Woolgar’s *Laboratory Life* takes the analysis of science to the ground floor, following scientists in their laboratories through an anthropological approach, to understand how scientific knowledge is constructed rhetorically (1979). In 1988, Bazerman broke ground in an analysis of the history and



genre of the scientific research article. Shortly after, Haraway introduced feminism to the rhetoric of science in *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, critiquing the gendered nature of scientific knowledge (1989). In 1992, Keller explores the relationship between reality and discourse, contending that nature is only accessible via representations, through language, and thus “no representation can ever ‘correspond’ to reality” (p. 5). In *Secrets of Life, Secrets of Death*, Keller examines how science is a gendered, subjective project, and literary devices, such as metaphors, shape how we process reality.

The rhetoric of science has traditionally focused on the historicizing and socializing of scientific knowledge and practice, initiated by Kuhn, and followed by the major voices in the field (Feyerabend; Latour; Gross; Keller; Mol) who took up the task of responding to Kuhn’s premises. However, in recent scholarship and research, a shift has emerged. Miller identifies “the changing nature of public support for higher education and the recent enthusiasm for ‘engaged scholarship’” as leading to new directions and questions for the rhetoric of science (p. 2). Shifting from a focus on historical case studies, and the major discoveries and inventions of significant scientists, contemporary scholars in the rhetoric of science are working toward engagement with scientific and civic discourses, applying the theoretical groundwork of the rhetoric of science to contemporary problems, such as climate change, the intersection of government and science policy, and the communicative gaps between scientists and various publics.

Additionally, researchers are increasingly incorporating cultural factors into their social-critique of science, exploring how scientific knowledge and practices function uniquely throughout cultures and different publics. In *Participation and Power*, Simmons advocates for the inclusion of citizens in public

decision-making concerning environmental policy (2007). She states that “a more critical rhetoric of debates is needed to dissolve the separation of risk assessment from risk communication... and locate epistemology within the process that involves the public” (p. 4). Simmons addresses the social composition of risk assessment and communication, much like Kuhn did for scientific revolutions.

To remain a relevant field of inquiry, the rhetoric of science must respond to contemporary exigencies and shift from pure historical analysis to approach real-world problem-solving. As Miller notes, “science itself is undergoing change perhaps as profound as the seventeenth-century scientific revolution” and it is important for rhetoric scholars to respond accordingly (p. 5). In an increasingly globalized, digital, and interconnected world (complicated by a litany of environmental issues requiring novel, transnational answers), it is imperative for rhetoric of science scholars to provide their skills and insight to bridging the gap between science and language, between specialists and publics, and between the rhetorical strategies of discourse and the “brute facts” of the natural world, realizing that in the end, the bridge itself is superfluous because the realms of the social and the natural are in fact two sides of the same coin. This is the task to which the rhetoric of science can lend itself. This is where my research seeks to make its contribution.

## CLIMATE CHANGE AS RHETORICAL AND SOCIOMATERIAL

With scorching summer temperatures and rising sea levels, it is difficult to ignore the empirical impacts of climate change. But is there more to this phenomenon that warrants serious analysis? In addition to climatologists and atmospheric scientists, a wide range of scholars and researchers have pursued the topic of climate change, examining not only its physiological effects, but its social dynamics. What is most crucial is the understanding that, as Fiskio articulates, “climate change is an

idea as well as an empirical reality” (p. 1). As such, it is an important topic and problem to solve, not only for scientists, but also for rhetoricians. While climate change, as a global phenomenon, is enacted through surface temperatures and increased amounts of carbon dioxide in the upper atmosphere (and all of the resulting, complex effects, from species loss to ocean acidification), it is also a concept—an idea. As such, climate change can be understood as sociomaterial, leading to what Orlikowski calls “insistence on speaking of the social and the material in the same register... not reverting to a limited dualism that treats them as separate (even if interacting) phenomena” (p. 1437). When rhetoric scholars analyze climate change, it is through a sociomaterial approach, one that cannot ignore the material reality of the scientific subject, but that also highlights the social construction, through rhetoric and discourse, of that subject. Therefore, even if it remains implicit in most research, these scholars are evoking Latour’s criticism of the Modernist divide between the social and the natural worlds—arguing for a collective proliferated by hybrids and quasi-objects. Climate change is rhetorical.

Scholars from sociology, rhetoric and composition, and communications studies, have researched the sociomaterial nature of climate change and its effects. Dryzek and Lo examine the role of rhetoric in translating scientific information to lay audiences, arguing that “bridging rhetoric” is a useful strategy for bringing climate deniers into the fold of adapting greenhouse gas (GHG) mitigation policy (p. 1). Guber studies the political polarization of climate change and how “what began as an ill-defined condition has gradually emerged as a public problem worthy of attention on the national policy agenda” (p. 107). Because climate change, as a topos for rhetorical studies, spans nearly every human endeavor: from science, politics and economics, to arts and entertainment, it is truly a global concept.

Jameson observes, in a commonly referenced quote, that “it is easier to imagine the end of the world than to imagine the end of capitalism” (p. 76). In opposition to our dominant economic system, climate change is often seen as the ultimate consequence to our endless pursuit of goods. Some scholars believe that facing climate change will force our global communities to finally come to terms with our notions of progress and accumulation of capital. Swyngedouw examines how climate change, understood in apocalyptic terms, relates to our “post-political and post-democratic condition” (p. 214). Stabilizing the climate, for Swyngedouw, is emblematic of our attempts to stabilize capitalism and our current systems of governance. In a sense, we aren’t trying to avert an environmental disaster, but rather, an economic one. Aravamudan (2013), in a similar study, examines how climate change builds from logic similar to that of the nuclear age, and yet, unlike nuclear war, presents a threat that may not be avoided. Aravamudan relies on Latour in her conclusion, noting that “climate change criticism will benefit from more distributionist notions of agency and should encourage thinkers to draw theories of action and responsibility from across the human-nonhuman divide” (p. 25).

Throughout the three analytical inquiries of my research, I will build upon this Latourian understanding of scientific phenomena, including climate change, to demonstrate a new method of problem solving. Climate change is unlike any other environmental, political, material, or social challenge humanity has faced. As such, it requires a novel approach to problem solving and new ways of understanding the agency, responsibility, and subjectivity of this vast collective of actants, both human and nonhuman, that we share this planet with. Discussing the disconnect between the scientific evidence of climate change, its impacts, and our current social responses, Latour notes that

“we are supposed to be extremely frightened people, but despite that we appear to sleep pretty well” (Naravane, 2011). My goal in this project is to explore how rhetoric and discourse may be used to disturb our sleep.

## THE NEED FOR A NEW SET OF TOOLS

Regardless of the term we attribute to our current geological epoch and the condition of our environment, it is unlike any that humans have encountered in the past. Beyond its material conditions, which are substantial enough, the Anthropocene presents humanity with ontological and philosophical challenges. Living in an environment that we not only have the capability to affect and destroy, but in fact *are currently* affecting and destroying, how do we inhabit this new space? How do we make a home amidst such widespread destruction? Just as Nietzsche declared the death of God in the 19<sup>th</sup> century, we must now reconcile with the death of an objective world, an unaffected environment, the belief in a “Nature” out there.

In *The Gay Science*, Nietzsche bemoans this death of God:

God is dead. God remains dead. And we have killed him. How shall we, murderers of all murderers, console ourselves? That which was the holiest and mightiest of all that the world has yet possessed has bled to death under our knives. Who will wipe this blood off us? With what water could we purify ourselves? What festivals of atonement, what sacred games shall we need to invent? Is not the greatness of this deed too great for us? Must we not ourselves become gods simply to be worthy of it? (p. 120)

Just as humanity shed God (representative of not just the Christian-Judeo entity, but any system of morality dictated by a higher power) in the 20<sup>th</sup> century, the Anthropocene suggests an environment in which we have shed the environment—as classically understood, as an objective “out there” in which we live and use for our needs—a background, essentially. And not just that. While Nietzsche’s epitaph is often condensed to simply “God is dead,” when read in its entirety, the passage suggests a much more complex state of affairs. Not only is God dead (and with Him, any form of absolute moral authority) but it is *we*, humanity, who have killed Him. As the perpetrators of this grand crime, we bear the responsibility for replacing this authority, for crafting new “sacred games” to fill the moral void that will inevitably be left in our lives (Nietzsche, p.120).

So, too, now in the Anthropocene, we bear the responsibility for a grand crime: the destruction of the environment. Just like Nietzsche asked of our 19<sup>th</sup> century forebears, we are left to wonder who or what will fill this void. Where will we now live? Technically speaking, the answer could be urban areas. By 2050, the United Nations predicts that 68% of the world’s population will live in cities and that percentage will only increase (United Nations, 2018). However, despite rampant land development and urban sprawl, we are unlikely to ever live in an entirely urban environment (think of your favorite dystopian science fiction film). There will always remain some vestiges of nonhuman life on this planet, and although these vestiges continue to shrink, they remain both physically and semantically. Consider the ironic naming of every new housing development that bears the name of some natural element that its creation helped destroy: Alpine Grove, Fox Run, Forest Park, Buffalo Hills. The list, of course, goes on. What, then, will become of this natural world we have dethroned, this Nature we have killed and remade as the Anthropocene?

The problem may lie not in the answer, but the question. One could argue that there is no conquering of the natural world by the social because these two worlds have always been different sides of the same coin. In *We Have Never Been Modern*, Bruno Latour proposes this argument in his fundamental critique of Modernity—a tradition and mode of thinking that is, he claims, established on this separation of the natural and the social, the real and the fabricated (1993). It is from this unique perspective, I suggest, that we can begin a more effective analysis of climate change and the Anthropocene.

## BRUNO LATOUR

In this new epoch, one that influences much more than just the natural environment and Earth's systems, those in critical studies and academia, too, must rethink their analytical frameworks, their toolsets, the very ground they stand on. In this spirit, scholars across the humanities and the sciences have considered the work of Bruno Latour, a French sociologist most well-known for his work in Science and Technology Studies (STS) (*Science in Action*, 1987), his critique of Modernism (*We Have Never Been Modern*, 1993), and his development of Actor-Network-Theory (ANT) (*Reassembling the Social*, 2005). While Latour remains a sociologist at heart, his work has influenced a wide spectrum of academic fields and departments, a testament to the applicability and breadth of his thinking and philosophy.

From sociology and anthropology, to economics and rhetoric, Latour is an intriguing figure in academic circles across North America and Europe. With an extensive body of work (14

monographs to date), Latour is almost as notorious for his paradoxes, contradictions, and complications, as he is for his contributions to STS and ANT. He is a controversial figure, in part, due to his critiques of science and Modernism and his radical approach to the agency he grants nonhumans. As Spinuzzi notes, “critics often read Latour as embracing a pantheistic or anthropomorphized view of the world: some imagine him conversing earnestly with doors or arguing with seatbelts” (p. 23). Many sociologists have taken up arms against Latour’s fundamental critique of the field, where he makes the claim that “the social cannot be construed as a kind of material or domain” and critiques “the project of providing a ‘social explanation’ of some other state of affairs” (2005, p. 1). Latour seeks to dismantle traditional sociology from the ground up and reimagine what it means to *do* sociology. Many find his theoretical approach unusable or misguided. Hekman argues that Latour’s critique of Postmodernism is essentially contradictory and offers little real guidance towards alternatives (2009). Bloor, in a defense of sociology, and the Strong Programme in particular, finds that “Latour’s ideas do not represent the way forward. If anything they are a step backwards” (p. 82).

But despite criticism, the impact of Latour’s thinking cannot be ignored. In 2007, he was ranked as the 10<sup>th</sup> most cited author in the humanities (ISI Web of Science, 2009). Rodseth claims that Latour is “the most important social theorist of the past 20 years and a vital source for emerging anthropological concepts of perspectivism, multinaturalism, and symmetrical ontology” (p. 865). Yet, perhaps the most useful assessment of Latour’s work is to be found somewhere in the middle. Attempting to come to terms with the paradoxical, often frustrating nature of Latour’s work, Kochan declares that the French sociologist is “interesting, bold, original, dynamic, entertaining, surprising,



challenging, remarkably prolific, and, sometimes, irritating” (p. 579). Handling Latour is much like grappling with an eel: slippery, dynamic, exciting, and occasionally dangerous.

Latour emerged as an important voice in the rhetoric of science with *Laboratory Life*, cowritten with Steve Woolgar, which employs an anthropological approach to science studies (1979). In a discipline in which nearly all scholars are working in response to Kuhn, Latour “advances a post-Kuhnian understanding of science; one where scientific shifts can be analyzed without subscribing to a predetermined view of scientific action” (Besel, p. 123). To understand science, Latour contends, one must follow the process of science (science in the making), as opposed to analyzing scientific work as a finished product (ready-made science). In *Science in Action*, he explores how scientific knowledge and facts are produced (1987). By entering the laboratory and the sites of scientific knowledge production, much like how an anthropologist would visit a native tribe in its homeland, Latour offers a unique, social perspective on how science is *made*. This anthropology of science reveals the political and persuasive forces that occur within the laboratory, as Latour is “following controversies and accompanying scientists up to the end, being slowly led out of science in the making” (1987, p. 15).

While Latour’s work and thinking has a natural fit within STS, recent research in rhetoric and composition has begun incorporating his theories into our own scholarly conversation. Lynch and Rivers’ *Thinking with Bruno Latour in Rhetoric and Composition* compiles a range of scholars who find the work of Latour beneficial to the field, offering new ways to look at old problems (2015). Lynch and Rivers claim that, situated in the field of rhetoric and composition, “reading Latour is like remembering something we thought we always knew, like a not-quite-repressed memory edging

forward in our minds” (p. 14). Latour expands the realm of rhetoric through the inclusion of nonhuman actants. While rhetoric, traditionally, is seen as a human tool, Lynch and Rivers observe that “in Latour’s agora, *everything* is nervously loquacious,” from doors and trees, to molecules and ideas (p. 14).

This reconceptualization of *who* can be considered a rhetor, *who* has the potential for rhetorical agency, *who* can make a difference in the state of affairs, is apt for our contemporary world of globalization, rapid technological advancements, and a troubled relationship with the environment. Walsh observes how a Latourian understanding of rhetoric is ideal for the world today:

Arguing in the Anthropocene is qualitatively and quantitatively different than arguing in the Classical agora. Now, no matter which direction we turn, we find the forum crowded not only with human speakers of all stripes but also with an awesome flotsam of nonhumans: computer models, polar bears, FitBits, genes, Tweets, YouTube videos, viruses, cookbooks, nebulae, and iPhones. (p. 403)

In this collective of humans, objects, things, beliefs, and ideas, it is a dramatic limitation to reserve rhetoric to just humans. While we certainly may make a much more pronounced influence on the world (as can be seen by the Anthropocene), we are not alone in this collective. The assumption that we are may have led us to this precarious state of affairs in the first place.

In addition to rhetoric, Latour lends valuable insight to composition, insisting that “truth production...is always a matter of writing, no matter the field” (Lynch & Rivers, p. 6). For Latour, the act of writing is more than simple transcription, but rather, an act of mediation. Rejecting the notion that writing is merely a conduit, a “transparent windowpane, transporting without deformation some information” Latour uses the analogy that a text “is not a story... it’s the functional equivalent of a laboratory” (2005, p. 149). Much how science creates scientific reality in the laboratory, in-the-making, writing creates a mediated version of reality, always representing a specific point-of-view, a version of truth. Latour’s understanding of discourse and language is similar to Baake’s investigation into the relationship between language and scientific knowledge, where he asks: “does metaphor produce knowledge or simply decorate and deliver it?” (p. 56). Latour would advocate, unequivocally, for the former.

Our contemporary era, in addition to the Anthropocene, is also often discussed in apocalyptic language. Climate change (in addition to endless wars, economic crises, population growth, global terrorism, etc.) places us in precarious times, end times, some even believe, where we face the ultimate existential crisis. How do we survive this modern age? For critical fields, such as rhetoric and composition, to help answer this question, many scholars believe we must revise what it means to conduct critical inquiry. Rhetoric and composition, according to Lynch, has undergone many turns, from the social to the ethical (2012). Now, however, he believes we find ourselves amidst a new turn, the apocalyptic, “in which the end of the world looms ever larger in our disciplinary and pedagogical imagination” (Lynch, p. 458). To confront this new turn, Lynch posits that “critical thinking... may finally have outlived its usefulness,” in the traditional sense of critical inquiry as a revealing or lifting of the veil to access Truth (p. 458). This, ironically, aligns with the root definition

of the apocalypse, which, from the Greek means a revelation. Locked in the academy, composition (and other fields of critical inquiry) have gone too long running around and smashing idols—declaring opposition as irrational fantasy.

To overcome this iconoclasm, Lynch relies on Latour to “help us articulate a way to move composition past the apocalyptic logic of critique and closer to an apocalyptic turn towards responsibility” (p. 459). We must engage with the messiness and plurality of the world. Lynch offers an insightful and practical example of working with a composition student who wanted to study environmental science “to save the world” (p. 473). Lynch suggests that instead of asking the student to “question her meta-narratives” we could, as composition instructors, teach her how “composition might help her in her self-described mission” (p. 474). A Latourian approach does just this, reuniting science and rhetoric, reuniting the natural and the social.

A Latourian approach strives for the full articulation of a question, rather than just the answer, as Latour claims that the “actors themselves make everything, including their own frames, their own theories, their own contexts, their own metaphysics, even their own ontologies” (2005, p. 147). To practice a Latourian approach is to follow the actors; describing, rather than explaining, the resulting phenomena, as “good inquiries always produce a lot of new descriptions” (p. 146).

## CRITIQUE OF MODERNITY

Following his first three books, Latour broadens his analysis from the laboratory to the entirety of the Modern project; essentially, the history of human thought and progress since the European

Enlightenment. Born of the 18<sup>th</sup> century, Modernity, for many historians and sociologists, can be characterized by “processes of urbanization, industrialization, democratization, [and] the emergence of an empirical-analytical approach to knowledge” (Wagner, p. 3). In an age of political and technical revolutions, the Enlightenment saw reason and science overtake religion as the primary forms of inquiry for understanding the world. Influenced by the work of Bacon, Descartes, Locke, and Spinoza, Modernity came to stand for ideals of liberty, progress, and modern science: a science now guided by empirical evidence, reasoning, and a standardized approach to work that would come to be known as the scientific method.

According to Latour, however, Modernity is more of a “concept, not a thing that happened” (2015, p. 221). Instead of understanding Modernity as a series of events, revolutions, and scientific discoveries, Latour views it as a mindset, an epistemological “emancipation from some stagnant, archaic and stifling past, so that ‘modern’ is always a way to orient action according to an arrow of time that distinguishes from the past to the future” (p. 221). As such, Modernism becomes a set of ideals that can be enacted to guide and shape the foundational values of our contemporary world.

According to Harman, the “modernist either appeals to a nature of things that exists whether we like it or not, or appeals instead to a human society that is nothing but an arbitrary projection of values onto a cold grey world of physical matter” (p. 251). In the Modernist schema, there is no intermingling between these two poles, between nature and culture as purveyors of truth. It always must be one or the other.

In *We Have Never Been Modern* (1993), Latour lays out the blueprint for his philosophical critique of Modernity. All of Modernism, for Latour, rests on one, *a priori* assumption: that of an ontological

division between the natural and the social worlds, between nature and culture, between subject and object (1991). Comparing this ontological stroke with the cutting of the mythological Gordian knot, he decries that “the shaft is broken: on the left, they [the Moderns] have put knowledge of things; on the right, power and human politics” (1993, p. 3). This division has allowed humankind to separate ourselves from the rest of the natural world. Chakrabarty notes that “it was this very separation between the animal and moral life of the human species that underlay, for a large part of the twentieth century, the separation of the human from the physical and biological sciences” (p. 383). As Modernity, fueled by reason, rationality, and modern science, shaped the world, the ontological gap between nature and culture grew ever wider.

The problem then, for Latour, is that no one has yet constructed an anthropological investigation of the Modern project, much as how Latour used an anthropological approach to science in his earlier work. Berliner et al. assert that Latour’s work “may be read as one sustained effort to make the tribe of ‘The Moderns’ the object of anthropological analysis: an in-depth ethnography of their modes of truth production, their institutions and experiences,” experiences founded on a divide between the natural and the cultural (p. 435). Especially in a contemporary age of rapidly advancing technology and globalized networks, it becomes more and more difficult for the Moderns to account for “the multiple links, the intersecting influences, the continual negotiations” of our world (p. 13). In one example, Latour uses a common routine: reading the morning newspaper. Condensed within just a few pages, the casual reader learns of ozone layer measurements above the Antarctic, Monsanto chemists, the AIDS virus, Japanese computers, radio tracking whales, the Pope, and the list goes on. How does one divide, classify, understand these complex phenomena? How are they connected and interrelated? Are they social, natural? Latour would answer, neither: they must be both.

Dissolving the Modernist division between natural and cultural, Latour seeks to understand these phenomena as what he calls hybrids, pointing out how “the smallest AIDS virus takes you from sex to the unconscious, then to Africa, tissue cultures, DNA and San Francisco” (2005, p. 2). Following a phenomenon through each of its mediators, one can gain a much more comprehensive understanding of the nature and complexity of such hybrids, recognizing the many agentic actants, both cultural and natural, that make up our contemporary world. Mediators, according to Latour, “transform, translate, distort, and modify the meaning or the elements they are supposed to carry” (p. 39).

Climate change is another powerful example of a Latourian hybrid. In our day and age, “people are not equipped with the mental and emotional repertoire to deal with such a vast scale of events... they have difficulty submitting to such a rapid acceleration” of responsibility and hopelessness (2014, p. 1). How can one respond to a crisis both natural and social? Where do we disperse the agency, and to whom? An understanding and articulation of climate change must go beyond rising temperature indexes and calving glaciers. To assess climate change, one must follow its long list actants that mediate the state of affairs: coal-powered plants, Republican politicians, electric cars, popular films, and the chemical composition of carbon dioxide itself.

### ACTOR-NETWORK THEORY (ANT)

To pursue this unique approach to sociology, Latour, along with John Law and Michel Callon, devised a novel approach to the study and understanding of complex phenomena. This approach,

termed Actor-Network Theory (ANT), developed from a foundational critique of sociology and a world in which it became increasingly difficult to separate the material from the social—a world of hybrids and quasi-objects. In *Reassembling the Social* (2005), Latour introduces ANT and its many complexities. ANT seeks to return sociology to square one and understand, exactly, what we mean by “social.” Latour notes that, in modern sociology, “the social seems to be diluted everywhere and yet nowhere in particular” (2005, p. 2). Historically, theorists and sociologists have treated the social as an object of study, a block of reality; however, Latour claims that “the social cannot be construed as a kind of material or domain” and becomes problematic when one attempts to understand it as a material, “comparable to other terms like ‘wooden’ [or] ‘steely’” (p. 1). Through the application of ANT, the social is no longer a “homogenous thing” but rather, a “trail of associations between heterogenous elements” (p. 5).

ANT breaks down social phenomena and understands them as relations and translational. Latour notes that ANT “was devised as a reaction to the often too global concepts like those of institutions, organizations, states and nations, adding to them more realistic and smaller sets of associations,” such as the actions and discourse of individuals and objects (1990, p. 2). Rivers explains how ANT is used “to trace the actors and to see the social as an emergent effect of the labors of many untold actors. Furthermore, ANT is predicated upon a refusal to decide, in advance, what constitutes the social” (2014). For Callon, this becomes a “sociology of translation” where we cast aside “social factors, norms, or particular institutional or organizational configurations,” and rely on the enrollment and mobilization of all the diverse actants in a network to understand social phenomena (p. 197). In one notable study, Callon analyzes the decline of scallop farms off the coast of France and includes the scallops themselves as critical actants (1984).



For ANT, solely including the actions of humans falls drastically short in understanding complex phenomena such as climate change, acid rain, or civil unrest in the Middle East. When deciding whether or not a traditional object (a nonhuman) should be considered an actor in a network, Latour asks: “does it make a difference in the course of some other agent’s action or not? Is there some trial that allows someone to detect this difference?” (2005, p. 71). In most instances, the answer will be yes. Let us return, for a moment, to our example of climate change and the greenhouse effect. Due to their chemical composition, nitrogen and oxygen, the primary gases in our atmosphere, are transparent to infrared light. Carbon dioxide, however, absorbs the infrared radiation, which has led to global warming as we pump more and more carbon emissions into the atmosphere. Would it be possible to argue, then, that carbon dioxide, as a chemical compound, does not play a significant role in this sociomaterial phenomenon we know as climate change? Should not carbon dioxide be considered an actant in this network, alongside coal-burning plants, politicians, Exxon-Mobil, and your neighbor who rides her bike to work?

ANT incorporates human and nonhuman actants within a network and offers them equal footing in the collective. This, in Latourian terminology, is referred to as a flattened ontology, or a “trope that argues a hierarchical configuration... a democratization of knowledge ordering” and shuffles the deck on the assumption that human perception and agency sits at the top of the hierarchy (Springett, p. 630). In a flattened ontology, agency is dispersed and each actant is “equally audible or valid within the system” allowing for the “decentralization of a single ‘objective’ voice” (p. 630). In an amusing analogy, Spinuzzi describes this flattened ontology, or symmetry, as comparable to a maximum bearing load on an elevator (2015). If an elevator can only hold 2,000lbs, it doesn’t really

matter what that 2,000lbs consists of, right? To the elevator, and to ensure the safety of its riders, everything becomes “judged by exactly the same criteria” and the resulting effect is the same (p. 25). A pound, in this methodology of symmetry, is simply a pound.

Finally, ANT resists the urge to presuppose intent or morality. Instead, ANT follows the actants themselves, observing them to “learn from them what the collective existence has become in their hands” (Latour, 2005, p. 12). As Latour notes, “ANT does not tell anyone the shape that is to be drawn—circles or cubes or lines—but only how to go about systematically recording the world-building abilities of the sites to be documented or registered” (1999, p. 21). Thus, ANT works to describe rather than explain a state of affairs, which allows for the analyst to then come to their own conclusion. For Holmes, this focus on description “refers to an empirical tracing of the entire range of mediators – human and nonhuman – that support a particular and localized cultural activity” (p. 426). This is a crucial distinction in epistemological terms because “description means avoiding the reproduction of conventional topoi and discourse to explain a particular rhetorical situation” (p. 427). In these terms, ANT becomes more of a tool, less of a set of theory-laden blinders.

## DISSERTATION OUTLINE

To examine climate change discourse with this new set of tools, this dissertation consists of five chapters. In this first chapter I have introduced the exigence and major themes and described my analytical framework, providing foundational information on climate change, the rhetoric of science, the philosophy of Bruno Latour, and Actor-Network Theory (ANT). In the next three analytical chapters, I examine the role of language and discourse in the sociomaterial construction of climate

change, positioned along the three major flash points, or environmental treaties (1987 Montreal Protocol, 1997 Kyoto Protocol, 2015 Paris Accords).

In chapter two, I examine the potential for the rhetorical agency of nonhuman actants, specifically environmental pollutants, and how this agency shapes the efficacy of environmental treaties. This chapter establishes phenomena as sociomaterial in nature and discusses why it is insufficient to understand these actants as either purely cultural or natural. This chapter also begins the examination of the roles of nonhuman actants within our shared world. In chapter three, I build from this sociomaterial understanding of phenomena to explore how scientific events are translated through various genres to wider audiences. This act of translation, from matters of fact to matters of concern, proves to be a critical rhetorical move in rallying public concern and interest for scientific issues. The final analytical chapter builds from the Montreal and Kyoto Protocols and examines the most recent attempt to mitigate global carbon emissions—the 2015 Paris Agreement. I use ANT to describe the development of the much-lauded International Solar Alliance (ISA) as a key accomplishment of the 2015 Paris Agreement. This ANT analysis puts into practice the key theoretical themes of the previous chapters to explore how a Latourian approach to rhetorical analysis can help us reveal new insights into the discourse surrounding our contemporary climate crisis. In chapter five, I conclude the project by addressing some common critiques of Latour and ANT, observe the situation of our current science wars, and consider the future of the rhetoric of climate change.

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# Chapter 2: The wolf and the dog: The rhetorical agency of nonhuman pollutants

## INTRODUCTION: THE WOLF AND THE DOG

In “Who Killed Rex,” Spinuzzi recounts an incident where a dog, Rex, is startled as a telephone service technician enters his backyard (2007). Rex runs past the technician, through the open gate, and is then struck dead by a passing car. Exploring this incident as a tangled network of actants, agency, and responsibility, Spinuzzi asks us to reexamine what may otherwise appear to be a simple question: who killed Rex? Spinuzzi uses this example to explore how various network theories “attempt to distribute agency, cognition, and (by extension) responsibility across the sociotechnical networks” (p. 45). One of these theories is Actor-Network Theory (ANT), which he finds advantageous in its inclusion of both humans and nonhumans as equal players, as “entities that enter into an alliance in order to satisfy their diverse aims” (p. 49). Thus, when attempting to understand who killed Rex, one must also consider the role of the fence itself, the street’s speed limit, and the network fibers that failed and led to the technician coming out in the first place. And while Spinuzzi is, in the end, able to eventually pin blame to the company manager (for failing to alert the technician about the dog in the yard) the article is demonstrative of a complex exploration of agency. I begin this chapter in a similar vein by presenting *two* canine-based scenarios, each enacted by similar actions, yet different perpetrators. These two scenarios will serve as the establishing metaphor for my discussion of the difference in rhetorical agency of environmental pollutants in the 1987 Montreal Protocol and the 1997 Kyoto Protocol.

### **Scenario 1: The Wolf**

In 2016, the US Fish and Wildlife Service (USFW) reports that, in Wyoming, wolves killed 243 livestock (Outdoor News, 2017). Although wolves are listed as a federally endangered species, the USFW frequently removes or kills any wolves known to attack livestock. In 2015, government wildlife managers killed 113 wolves accused of attacking livestock (Funk, 2018). Additionally, ranchers have been known to take matters into their own hands, poisoning or shooting wolves in retribution for lost cattle or sheep. While there is debate on the best methods for minimizing the loss of livestock, and environmental groups work to encourage the safe reintroduction of wolves into their native habitats, there is rarely any debate over who or what is to blame for the death of the livestock. The wolf is solely responsible. Agency, in these instances, is focused and direct.

### **Scenario 2: The Dog**

In 2014, a farmer in Idaho shot a dog that had been harassing his sheep. The actions of the farmer were legal because, in Idaho, it is permissible to kill a dog if it is “worrying, wounding, or killing any livestock” (Stuntz, 2014). Despite the legality of the actions, however, the dog’s owners sought out their own justice, tracking down the farmer and beating him so severely that his wounds required staples (*The Teton Valley News*, 2014). This led to criminal charges for the dog’s owners, but did not change the fact, of course, that the dog had been killed.

Both scenarios are initiated by a similar action, attack on livestock, and yet, the scenarios have radically different results. Due to differences in agency between the wolf and the dog, the events became either focused or more complex, more dispersed. When a wolf kills livestock, the agency,

and thus responsibility, is focused. The wolf killed the livestock and the wolf must pay the price. When a dog attacks livestock, however, responsibility for the action becomes distributed and complex as the agency of the dog is ingrained with the agency of the human owner. Enmeshed in our own sense of agency and identity, the dog acts as part of a sturdier network, one with stronger allies, compared to the wolf. In terms of the human versus the nonhuman, the wolf is neatly categorized as nonhuman. This is simple. The dog, however, “man’s best friend,” presents a much more complex case, as for many, they are treated like part of the family. The agentic potential of the dog is not solely its own, but rather, interrelated with that of the owner.

Both wolves and dogs are intelligent mammals, capable of decision-making, teamwork, and responding to social factors. It isn’t much of a stretch to assign some form of agency to either canid. There is an extensive history of scholarship that even examines the potential of animal agency (Steward, 2009; Notzke, 2017; Stormer & McGreavy, 2017). Carter and Charles point out that “although the term agency has been discussed extensively and attributed to animals as well as to humans, there is often a lack of agreement as to its meaning” (p. 323). Just how much agency can we attribute to animals? Just as ANT posits that an entity should be considered active and agentic if it affects or “mediates” any other actant, Bhattacharyya and Slocombe frame animal agency as “active decision-making roles that influence and affect social–ecological systems” (p. 3). However, in this project, we’re asked to extend this ontological “leap of faith” even further. What if we attribute agency, even responsibility, to actants outside the animal kingdom—actants without legs, brains, or even definable shapes?

This chapter attempts to do just that. Using the parable of the wolf and the dog, I build from these conflicts of agency to examine how two environmental pollutants, chlorofluorocarbons (CFCs) and carbon dioxide, complicate theories of rhetorical agency and evoke Latour's Modernist divide between the cultural and the natural (1993). I trace the rhetorical construction of these nonhuman actants through various genres of text and argue that the consideration of the agency and responsibility of nonhuman actants can help us to glean insight into the disparate levels of success between the Montreal Protocol (a response to CFCs and other ozone-depleting substances (ODS)) and the Kyoto Protocol (a response to carbon-dioxide emissions). In this chapter, I argue that CFCs exhibit agency similar to that of the wolf, while carbon dioxide (the primary pollutant responsible for anthropogenic climate change) presents a much more complex state of affairs, much like the dog, as it exhibits a form of agency that is enmeshed with our own.

## ACTOR-NETWORK THEORY AND RHETORICAL AGENCY

To analyze the rhetorical agency of pollutants, this project uses Actor-Network Theory (ANT), an approach to sociology developed by Bruno Latour, John Law, and Michel Callon, to understand scientific phenomena in a complex and increasingly technical world. Latour professes that “the origin of this approach can be found in the need for a new social theory adjusted to science and technology studies” (2005, p. 10). In a world occupied by an amalgamation of complex, interrelated phenomena (Latour discusses the difficulty of pinning down, for example, the AIDS virus as one, definable thing), it becomes increasingly difficult to provide a description of society without accounting for the myriad number of nonhuman actants.

When human and nonhuman actants interact and produce phenomena, they can be understood as actor-networks, which “acquire their meaning relationally” through the interactions of various actants: human and nonhuman, material and semiotic (Mol, p. 257). Mol uses “fish” as an example:

Thus it is not simply the term, but the very phenomenon of “fish” that is taken to exist thanks to its relations. A fish depends on, is constituted by, the water it swims in, the plankton or little fish that it eats, the right temperature and pH, and so on. Fish relate to meat as well – if only because they compete in food markets. (p. 257)

To study an actor-network, one must carefully describe the network of associations and “add to the many traces left by the social fluid through which the traces are rendered again present” (Latour, 2005, p. 133). This requires “sticking with description” in lieu of social explanations (p. 137). Rather than settling for a social abstraction, such as progress, science, or the good, ANT insists that you follow the actants and allow them to communicate the reality of the actor-network. The results may be messy, complex, or unorthodox, and Latour notes how with ANT “you may describe something that doesn’t at all look like a network—an individual state of mine, a piece of machinery, a fictional character” (p. 142). What is critical is to allow the actants within the network to decide the course of action, the state of affairs. It is by following the actants that one can gain a more honest and comprehensive understanding of the phenomenon.

One of the most distinct features of ANT is its treatment of the nonhuman. This term may seem relatively straightforward (that which is *not* human) but as Sayes notes, the term is a bit more

complex, as it is “intended to signal dissatisfaction with the philosophical tradition in which an object is automatically placed opposite a subject, and the two are treated as radically different” (p. 136). The debate between the division between object and subject is one with a rich philosophical history. In today’s society, one in which technological advancements force us to question what it means to be a subject, to be human, these debates have taken the forefront of many scholarly discussions. Lynch and Rivers note how “people are not the only actors who ‘wield’ rhetoric” and agency in our modern societies, and to be able to truly get at the essence of how our world is composed, we must reconsider the traditional “building blocks” of sociology to incorporate the object, the nonhuman (p. 14). In this revised sociology, Latour advocates for the inclusion of the nonhuman, claiming that “the project of ANT is simply to extend the list and modify the shapes and figures of those assembled as participants and to design a way to make them act as a durable whole” (2005, p. 72). Often accused of animism or anthropomorphism, this focus on the nonhuman does not ask that we treat these entities, such as a hammer or a door, as human. Rather, ANT asks that we seriously consider their ability to influence, or in Latourian terms, to *mediate*, other actants. For Latour, determining whether an entity should be considered an actant, one must ask a simple question: “does it make a difference in the course of some other agent’s action or not? Is there some trial that allows someone to detect the difference?” (p. 71).

This question is less straightforward than it may seem. Cooper observes that “agency has been a problem—and not only in the field of rhetoric and composition—for a long time” (p. 420). Latour echoes this sentiment, citing that “agency is about the most difficult problem there is in philosophy,” one that has troubled and intrigued philosophers and scholars since Antiquity (2005, p. 51). Rivers and Dorksens note that “a complication of agency is nothing new under the sun. Gorgias,

in the *Encomium of Helen*, distributes agency across the gods, fate, force, love, and speech” (p. 634).

But how can agency cast such a wide net? Is it not in the possession of the individual rhetor, the writer, the communicator? Is not agency something within the individual—to be wielded like a tool, or a weapon?

In an increasingly global, digitized, and interconnected world, it becomes harder and harder to conceive of the individual as the sole unit for rhetorical agency. Kerschbaum observes how recent rhetorical theory works to “move beyond treating agency as something that is purposefully or consciously wielded” (p. 57). In contemporary rhetorics, it is much more complex. Grabill and Pigg understand “agency as constituted through interaction,” shaped through context and by the interaction of various actants (p. 102). In a similar vein, Herndl and Licona see agency as “the conjunction of a set of social and subjective relations that constitute the possibility of action” (p. 133). Thus, agency becomes less a tool and more a set of relations, allowing for action in the world. Consider planting a garden. With minimal funding and space, I should have the agency to plant a modest garden. However, by removing the agency from the individual, myself, and conceiving of it as a “set of social and subjective relations,” I, in fact, am dependent on a long list of actants, both human and nonhuman (p. 133). The potential for the realization of my garden depends on a wide range of things: the time of the year, the local temperature, the consideration of my neighbors, the possibility of consumption by a squirrel or deer, the soil nutrients, the sturdiness of a shovel, experience with gardening my parents may or may not have provided, the television show that inspired this project in the first place. All these factors, or actants, do in fact “make a difference,” as Latour would say, and play relevant roles in my ability, or agency, to plant a garden (p. 71). What

may feel like, to the individual, as a personal decision, actually depends on the interaction of many actants within the collective.

The most visible actants capable of influencing my garden are human. A landlord could very quickly disallow any possibility for planting a garden. An invasive neighbor could, just as quickly, complain and shut down the garden or themselves use up the available plot of land. In this scenario, my agency for gardening has become distributed, dispersed, and collective, spread among various human actants. This is one conceptualization of agency; however, assigning agency to the nonhuman actants is another thing entirely. This pill is much harder for those in rhetoric and writing studies to swallow. To displace the human as the center of agentic potential, whether than be one human or multiple, is to displace the anthropocentric viewpoint from which we understand the world. Writing, of course, is a human endeavor. But how would rhetorical agency look if we decentralize the conceptualization of agency and communication even further by incorporating the nonhuman?

The nonhuman covers a wide range of actants: animals, cars, doors, laws, viruses, etc. But the nonhuman should not, according to Latour, be situated in a dichotomous relationship to the human. Rather, Latour believes that all actants exist as hybrids, or quasi-subjects, present within our “parliament of things” (1993, p. 142). We all exist within one grand, hybridized collective, and as Pflugfelder notes, “agency...is distributed within these quasi-forms” (p. 134). Latour provides an example of how a speed bump influences a driver’s action (1999). When forced to slow down, “the driver modifies his behavior through the mediation of the speed bump” (Latour, p. 186). Whether for moral reasons (safety of pedestrians) or personal ones (protecting the vehicle), the outcome remains the same: the driver slows down. The speed bump mediates the driver’s activity, and as a



result, enacts agency through a trial that makes a detectable difference. As Latour asks, “does it make a difference in the course of some other agent’s action or not?” (p. 71). Action, like agency, is “not a property of humans *but of an association of actants,*” and thus, emerges through the interactions of both humans and nonhumans (Latour, 1994, p. 35). It may seem strange to think that the speed bump “acts” to slow one’s car down, versus, say, a police officer who may pull you over. But with an understanding of agency as networked, distributed, and “constituted through interaction,” we only see the police officer as more agentic due to our anthropocentric bias (Grabill & Pigg, p. 102).

If nonhumans can enact agency, is it also possible for them to wield morality? Can we hold them, at least somewhat, responsible for their mediations? Latour presents another car-related example: the beeping noise a car makes when you fail to fasten your seatbelt (1992). After Latour obeys the beeping noise, quite annoyed, but also safer, he asks: “where is the morality? In me, a human driver, dominated by the mindless power of an artifact? Or in the artifact forcing me, a mindless human, to obey the law that I freely accepted when I get my driver’s license?” (p. 152). Morality, like agency, becomes obscured, complicated, disseminated—less like a piece of property, something you can own, and more like a set of relations. Morality, then, like agency (and even power), becomes translational, kinetic—something you do, not something you possess. As Latour notes, “just as a geologist can hear the clicks of radioactivity, but only if he is equipped with a Geiger counter, we can register the presence of morality in the world provided that we concentrate on that particular emission” (2013, p. 456). To be able to register the morality and agency of nonhumans, we need to be using the right tool.

That tool is ANT, which conceptualizes the world as a collective, filled with countless actants, both human and nonhuman, where phenomena should be understood as the effect of the gathering of these actants. My neighbors have the agency to enable or limit the potential for my garden. Thus, it is a shared agentic potential; however, the agency is also distributed among the weather, soil nutrients, deer, television programs, the blade of a shovel. Inverting the scenario, one can see how, in my gardening endeavor, I influence the agency of nonhumans. If I cover half an acre with my garden, I severely limit the agency for local flora to grow and enact the most basic unit of measurement for agency: to exist.

Considering the agency, responsibility, even morality, of nonhuman actants leads to a more complete understanding of our world. Of course, it also presents a much messier world as well. Lynch and Rivers argue that “if more responsibility is what we want, then we need more litigation... bigger courtrooms for a judicial rhetoric in which human and nonhumans actors face ever-stranger trials of strength” (p. 17). If we allow nonhumans a seat at the table, we must radically revise our notions of agency, responsibility, and even morality. If our table becomes longer, then, as Lynch and Rivers note, we’ll need bigger courtrooms. These bigger courtrooms with more rooms and longer hallways may lead us to get lost from time to time, but they also have the potential for a more inclusive conceptualization of our contemporary state of affairs, of the world we live in.

Through previous analysis, the world we live in is shaped and marked by social actants and events. Thus, major environmental treaties, such as the Montreal and Kyoto Protocols, have been traditionally understood as agreements between individuals representative of nation-states. The Montreal and Kyoto Protocols have been extensively examined from various perspectives:

economic, political, game theory, and the social. However, these accounts rarely, if ever, consider the role of the critical nonhuman actants (primarily, the environmental pollutants themselves). Thus, these accounts may be fuller, more comprehensive, if we use ANT to analyze the rhetorical agency of nonhuman actants.

## A TALE OF TWO TREATIES: THE MONTREAL AND KYOTO PROTOCOLS

### **1987 Montreal Protocol**

Chlorofluorocarbons (CFCs) were developed in the 1920's by Thomas Midgley, a mechanical engineer working at DuPont laboratories. Originally, they were developed as an "alternative to the coolant gases ammonia and sulfur dioxide used in refrigerators" (Rosemarin, p. 280). Because CFCs are both nontoxic and nonflammable, these chemicals were seen as a safer option for refrigeration, especially as air conditioning rose in popularity following the second World War (Elkins, 1999). As more and more industries found various applications for CFCs, including aerosol sprays, production continued to rise, and by 1986, worldwide production had reached 1.2 million tons annually (1990).

However, in 1985, when British scientists discovered the reduction of ozone over the southern Antarctic, it did not take long for strong public and political support to nearly wipe out CFC production and usage. By 1987, the Montreal Protocol, aimed at limiting CFC production, was universally ratified and CFCs and other ozone-depleting substances (ODS) dropped dramatically in both production and usage. I propose that the Montreal Protocol proved tremendously effective in reducing CFC production and use, in part, because CFCs, as an actant with rhetorical potential, was unable to effectively enmesh their rhetorical agency, and thus responsibility, with powerful allies, i.e., human actants. Like the wolves hunted down by ranchers in the American west, CFCs have nearly been driven to extinction.

In the 1980's, British scientists noticed that their ozone measurements were gradually reducing from year-to-year. In 1985, Farmer, Gardiner, and Shanklin published these findings, which “linked the decline in total ozone to the increase in CFC consumption” (Jones, p. 361). These results quickly spurred the international community into action, driven by fears of increasing solar radiation and the ongoing destruction of the ozone layer. That same year, delegates gathered for the Vienna Convention for the Protection of the Ozone Layer, which developed into the 1987 Montreal Protocol. Entered into force in 1989, this accord was signed by 197 parties, designed “to protect human health and environment against ‘adverse effects’ of human-induced changes to the ozone layer” (C2ES). The Montreal Protocol established limits to the production and consumption of ozone-damaging gases, including: halons, carbon tetrachloride, methyl chloroform, and most notably, CFCs (Jones, p. 363).

The Montreal Protocol is noteworthy for several reasons. Not only has it successfully addressed its primary goal, curbing the production and use of ODS, but it is also the United Nations’ first universally adopted treaty—and perhaps its most effective. By 2012, 98% of ODS have been phased out and there is “emerging evidence for the recovery of [the] stratospheric ozone” (Velders et al., p. 4814). One scientist, who helped discovered the ozone hole, believes that “Antarctic springtime ozone levels are expected to return to those first measured in the 1950s by 2080” (Shanklin, p. 35). In many ways, the Montreal Protocol is a success story, and as such, an ideal model for future environmental legislation.

The Montreal Protocol serves as evidence that countries can work together to confront a worldwide, common threat. But how was it able to do so? Barrett identifies four key characteristics that helped lead to the success of the Montreal Protocol:

- 1) limited the production *and* consumption of CFCs,
- 2) applied universally to all member states,
- 3) instituted permanent measures
- 4) created positive incentives, including funding for developing countries to assist with phasing out CFCs (2008)

Additionally, Gonzalez et al. note how the accord's flexibility has enabled its success. The Montreal Protocol was designed to adapt and fit uniquely to the economic terms of each member state (2015). The treaty "provides financial assistance to help developing countries transition to technologies that are more protective of the ozone layer and that allow those countries to eventually comply with treaty mandates" (Gonzalez et al., p. 125). Additionally, what is unique about the Montreal Protocol is that it was implemented before the science was officially settled. The Montreal Protocol was never designed as an end product, but rather, as a starting point for limiting CFC production and consumption.

### **1997 Kyoto Protocol**

Carbon dioxide is a naturally-occurring chemical compound, released by organisms via decomposition, respiration, the oceans, and volcanic activity (NETL). These processes amount to

what is known as the carbon cycle, wherein carbon is recycled throughout the planet as a necessary component for all biological life. In addition to these natural processes, carbon dioxide is also produced via anthropogenic processes, such as the burning of fossil fuels, primarily coal and natural gas, and in agriculture, industry, and human respiration. Since the Industrial Revolution, these activities have upset the balance of carbon in the atmosphere, as we have produced far more carbon into the atmosphere than the planet can readily absorb. Essentially, human activity and development has tipped the scale and disrupted the global carbon cycle. Since the 1800's, the amount of carbon dioxide in the atmosphere has increased from 280 parts-per-million (ppm) to 368 ppm in 2000, a 32% increase (Salam and Noguchi, p. 19-20).

Unlike CFCs, carbon dioxide is naturally occurring, and in fact, an essential and vital compound for life to exist. As both natural and anthropogenic, the ontology of carbon dioxide, and thus, the increase in carbon emissions which led to climate change, becomes a tricky point. Climate change deniers can point to the carbon cycle and historical fluctuations as evidence that temperatures and carbon dioxide levels rise and fall as part of natural oscillations. *The Heritage Foundation*, a conservative think tank, argues that “the strong early 20<sup>th</sup> century warming must be largely, if not entirely, natural” (Baliunas, 2002). Rather than the burning of fossil fuels and massive land development, they cite “changes in the energy output of the sun” as a natural cause to the rise in surface temperatures (2002). The key word, throughout the many arguments set to disprove anthropogenic climate change, is *natural*. If the rise in surface temperatures is a natural phenomenon, then we, as humans, have no reason and bear no responsibility to take action.

Thus, it was a much more complex task when UN member states gathered again to address the most recent existential global threat. In 1997, 82 countries, in addition to the European community, ratified the Kyoto Protocol, aimed at responding to climate change and the rise in global surface temperatures. To address the “greenhouse effect,” the Kyoto Protocol aimed to curb global greenhouse gas emissions, calling for a 5% reduction for developed countries by 2012 (Leaf, 2001). With 192 signatories to date, the Kyoto Protocol is comparable to the Montreal Protocol in both its size and level of inclusion, and due to the success of the Montreal Protocol, it is no surprise that there would be many similarities between the two treaties. Oberthur believes that “there is hardly any aspect of the...Kyoto Protocol which the Montreal Protocol has not influenced, about which it has not inspired discussions on adequate design or for which it has not been cited as a precedent” (p. 360). However, unlike the Montreal Protocol, two notable countries remain absent from the Kyoto Protocol. The United States and Canada, two of the world’s top carbon emitters, rejected the Kyoto Protocol. President Bush believed the accord to be fundamentally unfair since developing countries, such as China and India, were exempt from the same level of compliance as developed countries (Office of Press Secretary, 2001). Canada withdrew from the treaty in 2012, citing economic concerns and the inequality of regulations (CBC, 2011). With these major parties absent, and convoluted mechanisms of enforcement, the Kyoto Protocol has failed to produce results comparable to the Montreal Protocol. From 2000 to 2011, global GHG emissions not only failed to decrease, but actually increased by 39.7% (CDIAC, 2015). Assessing the failure of the Kyoto Protocol, Barrett identifies three main points:

To sum up, a climate treaty must achieve three things. It must get countries to participate; it must get participants to comply; and it must do both of these things even as it requires that

parties reduce their emissions substantially. The Kyoto Protocol satisfies none of these conditions. It would be easy to design a treaty that satisfied one or two of the conditions, but success depends on meeting all three of them—no exceptions. (p. 244)

The complexity of the emissions targets has also been identified as an issue. Individual countries were allowed to set their own emissions targets, numbers ranging dramatically between developed and developing nations. Countries were also offered a variety of methods to meet their emissions goals rather than just through the reduction of carbon dioxide and other GHGs. For example, Australia, the highest GHG emitter per capita in the world, implemented a land use exchange, allowing them to partially meet their emissions targets by reforesting land (Crowley, 2007). This converts the land into a carbon sink, which is an area, such as a forest or ocean, that absorbs more carbon than average. However, scholars have noted the inherent complexity to these methods. Crowley examines how Australia is essentially “faking commitment to meeting its target by not cutting energy emissions and by relying on land use change... to meet its Kyoto and BAU targets” (p. 119).

Scholars also emphasize the lack of enforcement and accountability, and how, in many ways, the Kyoto Protocol has no teeth. Aichele and Felbermayr point out that “even though the Kyoto Protocol has an enforcement body, there is no credible enforcement mechanism,” and thus, a key actant of enforcement is missing (p. 732). If member states fail to comply, there are no penalties, no repercussions, as even the countries who do meet their emissions goals “have no way in fact of ensuring reciprocal behavior” (Gardiner, p. 28). The Kyoto Protocol, then, is essentially a promise,



relying overwhelmingly on the good faith of each member-state. And regrettably, as the carbon emission levels show, many of these promises were not kept.

## RHETORICAL AGENCY OF CFCs

While politicians and scientists played critical roles in the development and efficacy of these environmental treaties, I suggest that there are important actants that have rarely been considered—primarily, the nonhuman. According to Latour, to analyze phenomena with ANT, one must “follow the actors themselves” to “learn from them what the collective existence has become in their hands” (2005, p. 12). ANT traces a description of various actants, how they gather, and what they say through their means of articulation. In this analysis, I follow two primary actants, CFCs and carbon dioxide, to understand the potential for the rhetorical agency of nonhumans. I use a multi-genre corpus of texts to follow the actants, reflecting the “mixed-up affairs” of a nonmodern analysis, one in which texts cannot be neatly divided as technical or social and phenomena emerge as hybrid in nature (Latour, 1993, p. 2). For example, in reading the morning newspaper, Latour notes that “the smallest AIDS virus takes you from sex to the unconscious, then to Africa, tissue cultures, DNA and San Francisco” (p. 2). In a similar vein, I follow two environmental pollutants through their various manifestations to gain insight into the varying efficacy of the Montreal and the Kyoto Protocols. This approach may add another layer, another angle, of scholarship to the understanding of these environmental treaties, in part, because as Latour posits, “innovations in knowledge naturally emerge from the collection deployed on the table” (1999, p. 38).

By 2012, 98% of ODS, including CFCs, had been phased out with “emerging evidence for the recovery of [the] stratospheric ozone” (Velders et al., p. 4814). Due to the ratification of the

Montreal Protocol and the successful implementation of its regulations, the battle against CFCs has practically been won. From peak production of 1.2 million tons in 1986, the production and use of CFCs is now obsolete. The success of the Montreal Protocol can be attributed to many factors, including public support, the multilateral fund, and even industry innovations, as companies designed chemicals without ODS (Rae, 2012). Yet I argue that another factor, one overlooked by most analyses, is how rhetorically, the agency of CFCs remained isolated as a strictly technical affair. Therefore, the network of associations remained limited, and thus, vulnerable to intervention.

In 1987, the year the Montreal Protocol was ratified, the *New York Times* describes the ozone as a “frail, invisible layer” without which “life on earth would be devastated” (1987). They also describe the Montreal Protocol, observing how “under the threat of the ozone hole, the countries meeting in Montreal have been frightened into salutary action” to combat “the human race go[ing] down a big black hole” (1987). The hole in the ozone is situated as a critical, existential threat to the whole of the human race. And who was cast as the villain? CFCs. A year later, the *Washington Post* describes the process by which CFCs destroy ozone, describing how CFCs “change character and gobble the ozone layer that partially screens withering ultraviolet rays and prevents skin cancer” (Weisskopf, 1988). The changing of character refers to how the chlorine molecules of CFCs only react and destroy ozone molecules in the upper atmosphere, shifting in character from something benign to something malicious. In 1989, the *New York Times* reports on another hole in the ozone layer, “growing at the same rate as one in 1987” (Browne, 1989). The article affirms that “scientists fear an epidemic of skin cancer, eye cataracts and other radiation-induced diseases will result” from increased UV radiation caused by CFC destruction of ozone (1989). John T. Lynch of the National

Science Foundation claims that “if these ozone holes keep growing like this, they'll eventually eat the world” (1989).

These descriptions of how CFCs destroy the “frail” ozone layer demonstrate the rhetorical agency of this nonhuman actant (*New York Times*, 1987). CFCs are deceptive, they “change character;” they’re even monstrous as they “gobble the ozone layer” with malicious intent (Weisskopf, 1988). Much like how the wolf has been vilified throughout history, CFCs become killers on the attack, and as a result, public support for the Montreal Protocol and the eradication of CFCs was immediate and widespread. The US Senate voted unanimously in support of limiting CFC production and the EPA administrator, Lee M. Thomas, noted that the Montreal Protocol “is an unprecedented demonstration of international cooperation and commitment to act responsibly to protect our common environment” (Shabecoff, 1988). Even DuPont, the creator and leading global producer of CFCs at the time, believed that the call for a 50% reduction in CFC production was “not stringent enough to prevent serious damage to the ozone layer” and they supported a “total phase-out of the chemicals” (*Los Angeles Times*, 1988).

Betrayed even by DuPont, perhaps their strongest ally, CFCs faced trouble as the Montreal Protocol was set into action. Latour notes that the power of technoscience lies in its “ability to spread networks further,” incorporating an ever-larger array of allies (1987, p. 249-250). The failure of technoscience, then, is the opposite. Latour reasons that “every time you hear about a successful application of a science look for the progressive extension of a network. Every time you hear about a failure of science, look for what part of which network has been punctured” (p. 249). In 1974, Molina and Rowland’s discovery of the ozone hole punctured the vast network, the mighty empire,

of industrial alliances that once produced 1.2 million annual tons of CFCs. Once entangled with refrigerants, bug spray, paint products, hair products, and the rising need for air conditioning in homes and cars around the world, CFCs lost their network, gradually, as their agency became limited to the assault on the ozone layer (Elkins, 1999). Agency, again, according to Herndl and Licona can be understood as “the conjunction of a set of social and subjective relations that constitute the possibility of action” (p. 133). The “social and subjective relations” can be understood as an actor-network. It is through these relations, the network, that an actant exists in the world, and through this existence, exhibits agency. When an actant is cut off from its network, its subjective relations, then its potential for rhetorical agency is increasingly limited. Its existence fades. Just as the wolf was nearly driven to extinction, due in part, to its social articulation as a monster and a villain, so, too, have CFCs been brought to the brink of extinction. The wolf was cut off from its actor-network as a keystone predator, a link in the biological web, and reduced to a killer of cattle and sheep. CFCs, despite their many technical applications, became reduced to the ozone killer. But how did this occur? Can we not rhetorically translate any actant into a monstrous villain to be rid of it? Can it really be that simple? Of course not.

Another key factor lies in the subject/object distinction, which aligns with the cultural/natural distinction Latour critiques as the foundation for the Modern project, classifying actants as either natural or socially constructed (1993). Defined by NOAA, CFCs are “nontoxic, nonflammable chemicals containing atoms of carbon, chlorine, and fluorine” (1999). A synthetic compound created in the DuPont laboratories, they are technical objects, void of any subjectivity. Thus, CFCs remain neatly on the cultural side of the nature/culture divide. However, CFCs complicate this bifurcation as a culture-object: cultural, having originate from human machinations (like law, Cubism, or poetry)

and yet, an object, since CFCs are rhetorically “abandoned to the empty mastery of science and technology” (Latour, 2004, p. 233). We have no love for objects. As subjects, we *use* them for whatever purposes we may devise. According to Latour, this is the central tenet of Modernism, which defines the ontological divide between subjects and objects, between the cultural and the natural, where objects are not afforded the potential for rhetorical agency. As a culture-object, CFCs are uniquely restricted. Not only do they remain an object, and thus, have a weakened claim to agency, but they are an object that we have devised. As such, we can exhibit complete control over this actant. It’s agency is, paradoxically, both nonexistent and entirely within our own hands. This, in part, has led to the widespread eradication of this environmental pollutant.

## RHETORICAL AGENCY OF CARBON DIOXIDE

Carbon dioxide is a naturally-occurring gas produced by respiration, volcanic eruptions, and other organic processes. Therefore, carbon dioxide can be conceptualized as a natural phenomenon.

However, it is also the product of many human activities, such as fossil fuel burning, manufacturing, and transportation. In 2017, the EPA reported that the US economy was responsible for emissions of 6,457 million metric tons of carbon dioxide (2017). Increased levels of carbon dioxide are also the indirect result of many human activities, including deforestation and agriculture. Therefore, carbon dioxide can be conceptualized as a social phenomenon. So, which is it?

Compared to CFCs, carbon dioxide presents a much more complex scenario for examining the rhetorical agency of nonhuman actants. Carbon dioxide is an excellent example of Latour’s hybrid, or quasi-subject: an actant which reveals the artificiality of the division between the subject and object—the “agent of this double construction – science with society and society with science”

(Latour, 1993, p. 6). Latour observes that the “ozone hole is too social and too narrated to be truly natural” (p. 6). So, too, has carbon dioxide become too political, too human, to be solely understood as a gas formed by one carbon molecule double bonded to two oxygen molecules. Carbon dioxide enrolls a variety of allies, those cultural and natural, to develop a wide and powerful network of associations. Thus, the potential for rhetorical agency is much greater—the potential to exist, far stronger.

Carbon dioxide enrolls a wide range of allies, from politicians, the automotive industry, to energy companies and even cultural identity. In the United States, we have coal country—the region in Appalachia that has historically dug out the nation’s coal reserves. This area proudly supports the production of coal and the burning of fossil fuels, which of course lead to carbon emissions. Some supporters even retrofit their vehicles to release even more carbon emissions, an activity known as “rolling coal” (Tabuchi, 2016). Not only does this release even more carbon dioxide into the atmosphere, but also poses as an immediate health risk to the driver through smoke inhalation. Why would anyone pursue this activity, which in addition to the health risks, can cost thousands of dollars? Because carbon dioxide manifests as more than just a technical phenomenon and operates within a broader actor-network, compared to CFCs, with powerful social allies. Even in the 1980’s, when companies still advocated for the production and use of CFCs, did we ever hear of anyone “rolling CFCs?”

This is the rhetorical power of carbon dioxide. No longer just an inert gas, carbon dioxide has managed to extend its network of associations through a vast range of alliances, from states fairs, beauty pageants, folk music, the automotive industry, to becoming an ally of one of the major

political parties in the United States. As President Trump tweeted in his persistent support of fossil fuels: “American is blessed with extraordinary energy abundance, including more than 250 years worth of beautiful clean coal” (2018). For Trump, and many Republicans, digging up coal and burning fossil fuels is synonymous with being American.

In addition to regional pride and patriotism, carbon dioxide and the burning of fossil fuels have even been linked with human morality. Epstein’s *The Moral Case for Fossil Fuels* argues that using fossil fuels, compared to renewable energy, is our moral imperative due to the advances in human health and progress they have afforded us (2014). For Epstein, it would be immoral *not* to burn fossil fuels as this source of energy can be directly linked to human health and progress. Others, however, argue the exact opposite. Climate scientist Caldeira contests the economic advantages of burning fossil fuels, arguing that by burning fossil fuels “we are saying ‘I am willing to impose tremendous climate risk on future generations living throughout the world, so that I personally can be 2% richer today’” (2012). Even Pope Francis, the most important moral voice for millions throughout the world, has addressed humanity’s imperative to combat climate change. In 2015, Pope Francis shared his *Laudato Si*, decrying the ongoing destruction of the natural environment and the “goods with which God has endowed her” (2015). With such a wide array of spokespeople and alliances, it is clear that carbon dioxide is much more than a chemical compound, enrolling important actants from a variety of different modes of existence, from politics, religion, to global laws and treaties. Culture is satisfied.

Rhetorically, carbon dioxide has transitioned from object to thing, from an object “out there” to “an issue very much in there, at any rate, a gathering” (Latour, 2004, p. 233). Carbon dioxide, as

represented by its many manifestations as “fossil fuel” or “coal,” has effectively gathered a wide array of powerful allies—in part, leading to the difficulties the global community has had in reducing carbon emissions and the burning of fossil fuels. How else could this be described but as rhetorical agency? If agency is relational and dynamic, not so much a force to be possessed, but rather, “the ability to make a difference,” it becomes difficult to claim that carbon dioxide has not made a substantial and far-reaching difference—not just on the natural environment and not just on our societies, but rather, on the collective, that which “distributes... elements of Nature and elements of the social world” (Latour, 1993, p. 107).

## CONCLUSION

This chapter considers a new method to examine the efficacy of the Montreal and Kyoto Protocols by focusing on the rhetorical agency of nonhuman actants, specifically, environmental pollutants. While agency is traditionally considered a property of “one who through conscious intention or free will causes change in the world,” we can no longer sustain such a narrow definition in our global and interconnected world (Cooper, p. 421). Agency is no longer a weapon to be wielded, but rather, a set of relations, a state of affairs, “a social/semiotic intersection that offers only a potential for action” (Herndl & Licona, p. 141). Within this broader, more inclusive, conceptualization of agency, nonhumans, too, should be allowed a seat at the table. As Latour argues, “*any thing* that does modify a state of affairs by making a difference is an actor” (2005, p. 71). Why deny the impact of nonhumans, such as CFCs and carbon dioxide, when they clearly make a difference in our state of affairs? Why not broaden our understanding of agency, and perhaps even, responsibility? Pflugfelder situates agency by examining “what moves and how that movement occurs” (p. 139). Did not the



environmental pollutants themselves put the entire actor-networks of the environmental treaties in motion?

So, we must now ask ourselves: if we are willing to attribute rhetorical agency to nonhumans, what does this mean? What does this theoretical flag in the dirt signify? I believe that, in our current climate, one where the anthropogenic impact on the environment has become so all-encompassing that it has thrust us into the Anthropocene, there is frankly no other way to remedy our place within the world without a more inclusive understanding of agency, of action, and of responsibility. It is when we reassert ourselves within this collective of things that we can see how humanity, despite all its clever machinations and technologies, is one actant among many that rely, integrally, on one another on a planet formed via biological systems. Serres calls for a natural contract wherein we must “add to the exclusively social contract a natural contract of symbiosis and reciprocity”—effectively rewriting our relationship with the environment (p. 38). However, before this contract can be written and signed, much like an international environmental treaty, the signatories must see one another as agentic participants with the inherent right to exist.

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# Chapter 3: Climate change: Matter of fact? Matter of concern? Or another matter entirely?

## INTRODUCTION

The average person is inundated by news and narratives depicting the impending peril of climate change. News, television, and film, even art exhibits, inform us that, without hyperbole, our world as we know it is on the brink of destruction. It is truly an apocalyptic moment, and yet, compared to other global environmental threats (such as the hole in the ozone) we have been unable to muster an effective response to climate change as caused by carbon dioxide emissions and other greenhouse gases. In fact, despite a growing abundance of scientific information and global support, worldwide carbon dioxide emissions increased by 3.1% from 2000 to 2004, tripling the rate of increase seen in the 1990s (Zabarenko, 2007). While the reasons are as varied and as complex as the phenomenon itself, one reason, I argue, is that we have been unable to effectively transform climate change, via discourse and language, from a matter of fact into a matter of concern.

In this chapter, I trace the development of Latour's "matters of fact" and "matters of concern," a distinction that parallels the Object and the Thing. I then examine a multi-genre corpus of texts to explore how and why we have failed to transform climate change from a matter of fact to a matter of concern. Then, I consider future strategies for revealing the fullness and the complexity, of a global phenomenon such as climate change, and suggest methods for more effectively addressing, through language and discourse, this ultimate threat of the Anthropocene.

In *Why Has Critique Run Out of Steam?* Latour questions his own contributions to critical studies as anti-science rhetoric grows louder and more profound (2004). In a world that provides credible platforms for 9/11 hoaxers, climate change deniers, and anti-vaxxers, Latour considers how critical theory and relativism have enabled these parties to use the “weapons of social critique” to dispute once-settled scientific facts (p. 230). From the academy, we see this as the “enemy” using our own toolset, using “naturalized facts when it suits them and social construction when it suits them” to drive a wedge into the foundation of scientific authority and knowledge (p. 227). Latour regrets how his own work in tracing the social construction of scientific facts and knowledge may have helped cultivate this age of mistrust and revisionist science.

Caught between empiricism and social construction, he considers why we in critical studies find it so difficult to simply state and stand by objective facts. Latour asks:

Was I wrong to participate in the invention of this field known as science studies? Is it enough to say that we did not really mean what we said? Why does it burn my tongue to say that global warming is a fact whether you like it or not? Why can't I simply say that the argument is closed for good? (p. 227)

Latour believes our “critical spirit has sent us down the wrong path” as we in critical studies have come to be seen as iconoclasts and destroyers, rather than truth-revealers—those who deconstruct the idols of our enemies and then scramble to assert the naturalization of our own (p. 231). To revive criticism and the scholarly community, Latour asserts that we need a new form of realism,



one inspired by the philosophy of William James, transforming matters of fact into matters of concern. Matters of fact are readily accepted claims, verifiably true, such as the color of a table or the laws of gravity; however, these concepts alone may not reveal the entirety of a phenomenon or event. One example of this transformation is the 2003 *Columbia* disaster, which, before the space shuttle was destroyed reentering the earth's atmosphere, was understood strictly in technical, factual terms; a "taken-for-granted, matter-of-factual projectile" (p. 234). Following the explosion, however, the spacecraft became a matter of concern for those around the world—no longer a technical object, but rather, a thing, an event, both a national and worldwide tragedy, representative of far more than just a hole in the left wing of the spacecraft.

The issue with matters of fact, Latour argues, is that they provide only a partial understanding of the world. To separate an object's materiality (such as its color, weight, shape) from its subjective construction (such as its role as cultural marker, personal affection, historical aversion) provides only a partial understanding of objects. By combining the two aspects, we are asked to understand the phenomena of our world as sociomaterial, which, for Orlikowski, is an "insistence on speaking of the social and the material in the same register... not reverting to a limited dualism that treats them as separate (even if interacting) phenomena" (p. 1437). Thus, in such a worldview, there are no such things as purely technical objects or issues or purely social topics or causes—everything (people, objects, events, ideas) becomes an amalgamation of the two, the social and the material.

Consider, for just one example, the phenomenon of the cow in both Hindu and Western culture. In both cultures, the materiality of the cow is quite similar. Despite different breeds, their genetic makeup is quite similar, and they are valued as animals of agriculture in both cultures for their grazing work and dairy products. These uses, in fact, are partly what make cows respected as holy

icons in Hinduism. The cow even embodies *Bhoomi*, a Hindu goddess of the Earth, and represents the important connection between the people and the Earth. Compare this to the sociomaterial construction of cows in Western culture. The materiality is the same, and yet, we in the West interpret and understand their agricultural uses much differently. This change in perception has led to the cultivation of cows for not just dairy, but meat as well. In the West, beef is a staple of many diets. In Hinduism, eating beef is a sin. Thus, even if cows in the United States and India have nearly the same genetic code, it would be difficult to argue that they are the same, due in part to the social construction of these animals. Thus, both the social and the material matter, and in fact, in this instance, one could argue that the social element is even more important.

Understanding phenomena as sociomaterial aligns with Latour's critique of Modernity (1993). In *We Have Never Been Modern*, Latour questions the division between the social (or the constructed) and the natural (or the real), arguing that this false division has formed the foundation of the Modern project, one beginning with the European Enlightenment. All of Modernism, for Latour, rests on one, *a priori* assumption: that of an ontological division between the natural and the social worlds, between nature and culture, between subjects and objects (1993). Comparing this ontological stroke with the cutting of the mythological Gordian knot, he decries that "the shaft is broken: on the left, they [the Moderns] have put knowledge of things; on the right, power and human politics" (1993, p. 3). This division has allowed humankind to separate ourselves from the rest of the natural world. Chakrabarty notes that "it was this very separation between the animal and moral life of the human species that underlay, for a large part of the twentieth century, the separation of the human from the physical and biological sciences" (p. 383). As Modernity, fueled by reason, rationality, and modern science, shaped the world, the ontological gap between nature and culture grew ever wider.

Dissolving the Modernist division between nature and culture, Latour seeks to understand these phenomena as hybrids, pointing out how, the AIDS virus for example, “takes you from sex to the unconscious, then to Africa, tissue cultures, DNA and San Francisco” (2005, p. 2). Tracing phenomena, Latour observes, always crosses through both the natural and the cultural. Following a phenomenon through each of its mediators, one can gain a much more comprehensive understanding of the nature and complexity of such hybrids, recognizing the many actants, both cultural and natural, that make up our contemporary world. Mediators, according to Latour, “transform, translate, distort, and modify the meaning or the elements they are supposed to carry” (p. 39). Climate change is another prime example of a Latourian hybrid. In our contemporary day, “people are not equipped with the mental and emotional repertoire to deal with such a vast scale of events... they have difficulty submitting to such a rapid acceleration” of responsibility and hopelessness (2014, p. 1). How can one respond to a crisis both natural and social and so beyond the scale of the individual? Where do we disperse the agency, the responsibility—and to whom? An understanding and articulation of climate change must go beyond rising temperature indexes and calving glaciers. To assess climate change, we must follow its long list of mediators to see the shape of the phenomenon. We need to follow the coal-powered plants, electric cars, popular films, Republican politicians, environmental groups, and even the chemical composition of carbon dioxide.

Events like the *Columbia* disaster serve as useful examples of how a matter of fact can be transformed into one of concern—wherein an event or phenomenon is rearticulated to include its social, and perhaps even metaphysical, parts. But can this same rhetorical strategy be used when dealing with a phenomenon on a much larger, even global scale? Our current climate crisis presents us with such a question. The majority of climatologists around the world insist that the empirical data proves the existence of climate change. There is a clear and dramatic rise in average global

surface temperatures, resulting from an increase in carbon dioxide and other greenhouse gases in the atmosphere. According to NASA, the average global temperature has risen 0.8° Celsius since 1880, and perhaps even more alarmingly, two-thirds of that increase has occurred since 1975 (NASA Earth Observatory). This rise in temperature has led to a litany of global effects, including, but not limited to: sea-level rise, desertification, mass species loss, lack of food and water security, and more frequent and extreme weather events, including droughts and floods. These effects are littered throughout the news media and popular culture, almost impossible to avoid.

If this list of effects sounds like a preview of the apocalypse to you, you're not alone. Many scholars, authors, and filmmakers articulate climate change through apocalyptic language and imagery. Novels like *The Road*, *The Year of the Flood*, and *The Collapse of Western Civilization* present dystopian futures of environmental and social collapse. Films such as *An Inconvenient Truth* and *The Day After Tomorrow* bring the effects of climate change (whether dramatized or not) to life on the screen. And while many fear these renditions of climate change leave audiences feeling hopeless and powerless, some defend such depictions, noting how, for example, in the dramatic flooding of New York City in *The Day After Tomorrow*, "one pen portrait of a drowned New York is worth a thousand climate models" (Randall, p. 455). Even scientists occasionally feed into the allure of using apocalyptic language when discussing climate change. Kate Marvel, a climate scientist, claims that "climate change isn't a supervillain. It's worse" (2018). And James Hansen, who originally testified to Congress about the devastating consequences of unchecked climate change, uses a 2012 TedTalk presentation to paint a future of melting ice sheets, flooded cities, and terrifying heat waves.

Clearly, climate change is a cause for global concern. Why then, we must ask ourselves, have we been unable to sufficiently respond? Compared to previous global environmental threats, such as

acid rain or the hole in the ozone, treaties and government policies have largely failed to address climate change. The reasons are as varied and as complex as the phenomenon itself. But one reason, I argue, is that climate change presents unique difficulties in the transformation from a matter of fact to a matter of concern. When climate change *is* transformed from a matter of fact into a matter of concern, my analysis suggests that the alliance of concerns, the actor-network, overwhelms and destabilizes the original event. There are simply too many. Additionally, climate change also presents a unique paradox in its reversal of Latour's notion of Antifetishism, wherein one believes a thing or concept loses its power when you reveal its social construction (2004). Unlike most fetishized objects, climate change gains rhetorical power through its social construction and effects. However, first I will briefly trace the philosophical distinction between the Object and the Thing. Following that, I will parallel this to Latour's matters of fact and matters of concern, which will develop into an analysis of how environmental threats are transformed from facts to concerns.

## OBJECTS AND THINGS

There is a rich history of philosophical inquiry into the world of objects and things. Kant claims we are unable to access the reality of the world, and instead, only appearances we intuit. Kant's Transcendental Idealism asserts that "space and time are only sensible forms of our intuition, but not determinations given for themselves or conditions of objects as things in themselves" ([als Dinge an sich selbst]. (A369; the Critique is quoted from the Guyer & Wood translation (1998)). Therefore, time and space, and all the objects which inhabit these dimensions, are not real in themselves, but the results of human perception. Heidegger, in a similar vein, believes that objects exists independent of our subjective, lived experiences, outside "the Dasein-centred context of action in which the equipmental entity is involved" (Stanford Encyclopedia of Philosophy, 2011). However, unlike Kant, Heidegger "argues that from the transcendental standpoint we can say

neither that natural things do depend on us, nor that they do not” (Blattner, p. 185). Essentially, we cannot truly confirm either way. For Heidegger, objects become tools for the fulfillment of our actions, like how the craftsman rarely reflects upon his hammer. The Thing, however, is much more complex, as Heidegger observes how it is “also that which is not wood or stone, but every task and enterprise” (p. 5). In defining the Thing, “we seek what makes the Thing a Thing and not what makes it a stone or wood; what conditions (*be-dingt*) the thing” (Heidegger, p. 8). And ultimately, what performs this condition is human perception, our mental craftwork that moves the Object from wood or stone to the Thing of sociomaterial implications.

Both Kant and Heidegger reject any strict form of realism, and consequently, the claim of modern science to directly access the phenomena of the world. Modern science, from the tradition of Enlightenment thinking, is founded on the ethos of empirical observation. The world can be experienced, observed, and measured through our senses, and then understood through these calculations. This is the backbone of the scientific method. Ask most working scientists if the way they *feel* about an object of study makes any impact, and they will likely dismiss the notion. From the Modernist tradition, the social does not bleed over into the material in the conduct of science.

To interrogate this division, scholars in the latter half of the 20<sup>th</sup> century began to analyze scientific work and knowledge. From scholars such as Bruno Latour, Thomas Kuhn, Paul Feyerabend, Annemarie Mol, Michel Serres, and Evelyn Fox Keller, the rhetoric of science has developed into a field of its own—examining the role of the social in science work. Latour, in particular, posits the distinction between the Object and the Thing, rearticulated through the lens of the rhetoric of science. Building from Heidegger, Latour articulates his own understanding of the Thing: “A thing is, in one sense, an object out there and, in another sense, an issue very much in there, at any rate, a

gathering. To use the term I introduced earlier now more precisely, the same word thing designates matters of fact and matters of concern” (2004, p. 233). The gathering transforms the Object into the Thing by incorporating the “united four, earth and sky, divinities and mortals, in the simple onefold of their self-unified fourfold” (Heidegger, p. 178). The gathering is the accumulation of all actants (to use Latour’s terminology), both social and material, both cultural and natural, that create a given phenomenon or event. This full articulation of the phenomenon, then, becomes the “thingness” of the Thing—the reunion of the Modernist poles of the social and the material.

## FACTS AND CONCERNS

There is a discernible parallel from the distinction between the Object and the Thing to the difference between matters of fact and matters of concern. The Object without its *thingness* is incomplete, just as Latour posits that “matters of fact are not all that is given in experience” (2004, p. 232). He notes that “matters of fact are only very partial and, I would argue, very polemical, very political renderings of matters of concern and only a subset of what could also be called states of affairs” (p. 232). The Object and matters of fact present a black-boxed phenomenon detached of its network of associations. Things, then, correlate with matters of concern, working to reveal the fullness of the phenomenon by embracing its social, messy, complex nature within the current state of affairs.

Latour sees us entering a gradual return to a world of things, to a world driven by concerns. Following 9/11, he observes how “Things are gathering again. Was it not extraordinarily moving to see... the long crowds, the angry messages, the passionate emails, the huge agoras, the long editorials that connected so many people to so many variations of the project to replace the Twin Towers?” (p. 236). And yet, there is a drawback here, because “when we try to reconnect scientific

objects with their aura, their crown, their web of associations, when we accompany them back to their gathering, we always appear to weaken them, not to strengthen their claim to reality” (p. 237). Just consider how natural phenomena shifted from the domain of the gods to empirical science. Or consider the strength of Judeo-Christian morality following Nietzsche’s genealogical deconstruction of good and evil (1887). In the context of traditional critique, exposing the social construction of the Thing has been equated to diminishing its impact on reality, especially within Science and Technology Studies (STS) and the “hard” sciences. The more it is made, the less it is real. Following the analytical section of this chapter, I’ll return to this concept in greater depth.

Researchers throughout a variety of academic fields, in both the humanities and the sciences, use Latour’s analysis of facts and concerns to reconnect the technical and social aspects of scientific phenomena. In doing so, they hope to reengage with topics and objects traditionally deemed purely technical, or scientific, and to craft more effective communication strategies. To understand a topic or object as a matter of concern is to reengage the social elements with the technical. To demonstrate the wide range of applicability for the theory, I briefly summarize three research cases: the banana industry, underage drinking, and earthquake risk communication, each of which uses the development from matters of fact to matters of concern to explore processes for understanding and communicating scientific phenomena.

In an analysis of the global banana industry, Hill uses Latour’s theory to “identify some of the limitations of speaking in a matter of fact way and of focusing on capitalist and neoliberal economies as the yardstick by which to assess all food economy initiatives” (p. 551). She finds this merger of both human and nonhuman actancy a vital move in today’s world, in the Anthropocene, and a beneficial method for using narratives to resist the global machinations of capitalism. Hill notes that:



Shifting focus from matters of fact to matters of concern invites open conversation and collective effort between the different actors gathered and assembled around a particular concern. In a matter of concern mode of inquiry gathering and assembling methods shift focus toward how scholars, lay researchers, farmers, banana trees, weather events, and a host of other 'actors' work together. (p. 561)

In other words, through the inclusion of social narrative, we can better understand the full range of impacts of such a global, complex, and technical system, thereby offering potential for more widespread equity among more actants, both human and nonhuman alike.

In an examination of underage drinking in Sweden, Forsemalm uses matters of fact and matters of concern to identify more productive discourse strategies for communicating the risks of alcohol consumption to Swedish youth. Designing peer-to-peer discussion sessions, Forsemalm seeks to “understand how risks and knowledge about alcohol consumption is acquired by young people and ‘uploaded’ to peers” (p. 17). By resituating the source and authority of knowledge, he finds that “through the use of youth juries, their views can become a matter of concern for society through the production and use of figures and research findings, as opposed to a matter of fact, as in the case of the adult world informing youth about ‘how it is’” (p. 18). Thus, the positionality of matters of concern is emphasized here. Matters of fact, often, are presented from one, authoritative point-of-view, such as that of modern science or economics. These are difficult authorities to question or destabilize. With matters of concern, however, who and where information or an argument comes from becomes relevant and allows for discourse strategies that respond to local and specific actants. This can add vital understanding to scientific phenomena. Take climate change for example. While

the technical process of the increase in carbon dioxide in the atmosphere is relatively straightforward, relatively objective, the effects of climate change are seen, experienced, and understood quite differently depending on one's location, education, political beliefs, or any other social factor. My climate change, simply enough, is not the same as your climate change.

Ickert and Stewart take up the theory in exploring new strategies for risk communication between scientists and the public, focusing on earthquake risk in Turkey. Compared to at-risk communities in the US and Japan, Ickert and Stewart found unique challenges in Istanbul. Despite suffering from a major earthquake in 1999, citizens cited “endemic corruption, greed and selfishness” as the root causes of their vulnerable cities, making it difficult for them to focus on geological risks (p. 2). In response, the researchers restructured the conversations between scientists and the public, reporting on a communication workshop which focused on “the local politicized nature of seismic preparedness in Istanbul” (p. 3). By incorporating the social dynamics of this scientific risk communication, Ickert and Stewart advocate “fostering a more nuanced understanding and awareness of the complexities of science-public collaborations” (p. 20).

Next, I analyze two of the most global and potentially devastating environmental threats (the hole in the ozone and climate change) to examine, through a multi-genre corpus of texts, the unique strategies used in these texts to transform these scientific phenomena from matters of fact to matters of concern. A more focused and direct articulation of the risks of the hole in the ozone allowed for a more effective transition from fact to concern. For climate change, as will be shown in the analysis, a complication of “too many concerns” has in fact weakened the phenomena, and additionally, the potential for an effective response.

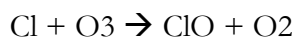
## MAKING THE OZONE HOLE A MATTER OF CONCERN

During the 1980s, British scientists observed a decrease in the percentage of ozone in their atmospheric measurements in Antarctica. In 1985, Farmer, Gardiner, and Shanklin published their findings, linking the decline in ozone to a global increase in chlorofluorocarbon (CFC) consumption (Jones, 2008). It didn't take long for these results to spur a strong and swift response from communities throughout the world as fears rose over the potential effects of this hole in the ozone. This global response culminated in 1987 with the ratification of the Montreal Protocol, signed by 197 parties to "protect human health and environment against 'adverse effects' of human-induced changes to the ozone layer" (Center for Climate and Energy Solutions). The Montreal Protocol established limits to the production and consumption of ozone-damaging gases, including: halons, carbon tetrachloride, methyl chloroform, and most notably, chlorofluorocarbons (CFCs) (Jones, p. 363). By 2012, 98% of ODS had been phased out and there is "emerging evidence for the recovery of [the] stratospheric ozone" (Velders et al., p. 4814). Shanklin, one of the scientists who originally discovered the hole, believes that "Antarctic springtime ozone levels are expected to return to those first measured in the 1950s by 2080" (p. 35). This swift and effective response is even more impressive when compared to recent environmental treaties aimed at addressing environmental threats, such as the 1997 Kyoto Protocol.

In addition to the UN delegation and the effective design of the Montreal Protocol, there was also overwhelming public support for responding to the hole in the ozone. How was the global public swayed to respond in such a prompt and decisive manner? In part, because the matter of fact (the decreased percentage of ozone in the atmosphere) was transformed into a matter of concern, one invoking health risks, monstrous chemicals, and geopolitical power balances. Through the enrollment of these allies, this matter of fact quickly became a global matter of concern. It took only

two years following Farmer, Gardiner, and Shanklin’s publication to initially ratify the Montreal Protocol. Over time, this action dismantled an entire industry of CFC production and consumer consumption. Using ANT, I trace the actants through a variety of texts to begin to paint a picture of how the hole in the ozone went from a matter of fact to a matter of concern.

It began with the discovery of a chemical reaction. In 1974, Molina and Rowland published their findings that chlorofluoromethanes can lead to the destruction of atmospheric ozone. In a brief *Nature* article, they outline how, via photodissociation, the chlorine atoms break apart from the chlorofluoromethanes and CFCs and eat away at atmospheric ozone atoms. This chain reaction is expressed in their article:



In addition to the chemical reaction, they note that “chlorofluoromethanes are being added to the environment in steadily increasing amounts” and could identify that “photodissociation of the chlorofluoromethanes... leads to the destruction of atmospheric ozone” (p. 810). In 2007, Rowland reflected on this initial discovery: “You don’t often get many chills down your back when you look at scientific results... but that had been one of those moments” (ACS, 2017). Despite the shock, the language and discourse of their scientific research article adheres to the stylistic characteristics of scientific communication: it is objective, concise, and clear, with a focus on a description of the natural phenomenon, rather than an explanation for why it is important. Molina and Rowland articulate ozone destruction as a matter of fact—an observable, real phenomenon. As such, their concern, and even the chills down their backs, is excluded from the discourse of the article because, traditionally, concern has no role in the rhetoric of a scientific research article. Although the

exclusion of the concern, or the rationale for why an audience should care, may make the genre feel incomplete, it also lends strength and ethos to the discourse. Objective language and description crafts facts, and facts, unlike concerns, fears, or opinions, are sturdy—and perhaps more importantly—they are *real*. Latour notes how critique has often been deflected by the strength of scientific discourse as “we witnessed that the black boxes of science remained closed and that it was rather the tools that lay in the dust of our workshop, disjointed and broken” (2004, p. 242).

In 1985, Farman, Gardiner, and Shanklin confirmed Molina and Rowland’s initial research. As part of the British Antarctic Survey, they discovered considerably low upper-stratospheric ozone levels during the Antarctic spring and hypothesized that “chemical causes must be considered” (p. 207). They used spectrophotometer data to record the considerable drop in ozone levels. While ozone is depleted by visible light, which explains ozone’s seasonal variances, the scientists observed a much more dramatic decline when higher levels of chlorine were present in the upper-stratosphere (1985). This discovery, the relationship between chlorine atoms and ozone atoms, proved to be the first important step in linking ozone destruction to chlorofluorocarbons (CFCs) and other ozone depleting substances (ODS).

Despite this potentially devastating discovery, the language employed by Farman, Gardiner, and Shanklin remains adherent to the characteristics and purpose of technical and scientific writing: “to transmit accurate information” (Longo, p. 62). To do so, many scholars and working scientists alike believe that the most crucial element is to utilize “clear language as a conduit of objective meaning” (p. 63). Clarity and concision: the two fundamentals of effective scientific discourse. Through this strategy, scientific writers work to “describe the world as it really is,” which according to Hill, is an

essential feature of constructing a matter of fact. Via technical, objective language, supported by visual data and graphs, these articles present the technical nature of the phenomenon.

In this sense, the destruction of ozone is articulated as an object, or Heidegger's "bearers of determinate properties that exist independently of the Dasein-centred context of action" (Wheeler, 2011). Despite the anthropocentric cause of this event in the upper-stratosphere (which would be confirmed in later years), the chemical reaction is represented as existing independent of human experience—so independent, in fact, that NASA initially failed to even discover the event as its instruments were designed to discard any data that seemed too low or too high, assuming these would be technical malfunctions. Yet this is the aim of scientific discourse and writing: to present the world as *object-ive*, functioning in predictable, measurable systems regardless of human perception. Doubleday and Connell note how "scientific writing, first and foremost, is taught to be objective and accurate, a means to an end to explain the data" (p. 812). In this understanding of science, the role of the scientist is as a Latourian "spokesperson," or "someone who speaks for others, who, or which, do not speak" (1987, p. 71). Since natural phenomena and scientific instruments do not "speak" in a traditional sense, scientists must fill this void and determine, through their own discourse and language, what the phenomena wish to "say." This is a foundational tenet of the rhetoric of science as it introduces a critical, and inevitable, social element to the work of science.

And it is through these discourse strategies, those of clarity, concision, and objectivity, that the matter of fact is constructed. Hill notes that the matter of fact works to disguise the role of "language as having symbolic power that reinforces certain ways of thinking and acting over others" (p. 554). And yet, is this not advantageous for the mode of inquiry which we call science? How else

to convince a wide range of audiences, from government officials, funding agencies, public citizens, to of course, other scientists, that your research and data is valid? While effective, this method of articulation obscures the fullness of reality. Much how Heidegger compares ontological inquiry as peering around a dark room with a flashlight, where certain aspects of the room are illuminated while others are left dark, the matter of fact leaves concepts like subjectivity, persuasion, and perception in the dark. Through the strategies of scientific writing, the causes for concern are left invisible and in the dark.

However, despite the strength of the matter of fact, this method of articulation is “not all that is given in experience” (Latour, p. 232). What remains unexplored by the matter of fact is an event’s or object’s vast network of associations—specifically, how the phenomenon is experienced. Bellacasa notes how “the notion of matters of concern extends the early insight that scientific and technological assemblages are not just objects but knots of social and political interests (p. 86). One cannot deny the “brute facts” of the experience or scientific phenomenon, but to stop there is to offer up a drastically incomplete conceptualization.

To present the hole in the ozone as a matter of concern, popular periodicals played a particularly effective role. Unbound by the standards and goals of a scientific research article, it is the purpose of popular media, such as magazines and newspapers, to invoke care and concern within their readers. On the one hand, this can deteriorate into sensationalism, even yellow journalism. On the other, however, it can serve as an important impetus for rallying communities to affect change in the world. To analyze this shift from fact to concern, I selected three articles from the *New York Times* and *Newsweek*, two of the most widely distributed publications in the US. These articles were chosen due to their specific focus on the ozone hole, using the rhetorical strategies of matters of concern.

In 1987, the *New York Times* describes hazardous conditions for scientists working under the ozone hole. The article quotes Dr. Peter E. Wilkniss, a director with the National Science Foundation, who expresses concern for “the health and safety of our people due to threats from increased levels of ultraviolet radiation” (Sullivan, 1987). The “lethal” effect of ultraviolet radiation is a primary focus with its potential for skin damage, blindness, and even skin cancer. What’s interesting about Sullivan’s article is the manner in which, rhetorically, the focus shifts from the Object (the hole in the ozone) to the Thing (scientists at risk of skin cancer while valiantly working in this “war zone” for the good of humanity). Transformed from chemical reactions and graphs, the hole in the ozone is now “lethal to many life forms,” and specific individuals (1987). This transformation is akin to how, following its destruction, the space shuttle *Columbia* was transformed into a matter of concern by invoking references to heaven, lost lives, grieving families, a wounded nation, the hole in the ozone is humanized through this articulation and focus.

In 1991, *Newsweek* presents its own version of life under the ozone hole as a “Twilight Zone” of “myopic” rabbits, sheep blinded by cataracts, and a local Chilean rancher left blinded and burned by ultraviolet radiation (Larmer, 1991). One rancher describes how his arms burn “like boiling water” after long days of exposure. The region’s lone dermatologist notes that the increase in blindness and skin damage makes it feel as if the “Martians had landed” (1991). In addition to the personal consequences of the hole in the ozone, the article also develops a global-economic narrative. Quoting one rancher, who lost eighty sheep to blindness, the article notes the hegemonic battle between the Global North and South, as those in Chile believe they are bearing the brunt of the consequences for the “industrialized countries that are depleting the ozone” (1991). This further expands the rhetorical power and network of alliances for the hole in the ozone, as now, more than



just a physical threat, the actant has become a geopolitical consequence, invoking colonialism, trade disparities, and a swath of social relations.

In perhaps the text's most evocative quote, Bedrich Magas, an electrical engineer, calls the increase in ultraviolet radiation "AIDS from the sky" (1991). With what may seem like a rather extreme and non-scientific claim, it is important to note the historical context of this comment, as in the early 1990's, the AIDS epidemic was still underway. The CDC reports that "by the end of 1991, AIDS will be the second leading cause of death among men 25--44 years of age and is likely to be one of the five leading causes of death among women aged 15--44 years in the United States" (CDC, 1998). Magas's metaphor serves as perhaps the most dramatic example of how a phenomenon can be articulated as a matter of concern. Consider how the phenomenon, the original chemical reaction between chlorine atoms and ozone atoms, is articulated from the scientific research article's articulation:



to *Newsweek's* articulation of the same phenomenon:

"like AIDS from the sky."

As scientific discourse is translated to popular media, Luzon notes how "popularization is not a matter of simplification or 'translation,' but of recontextualization of scientific discourse into another domain" (p. 429). This other domain is that of concern. By articulating the phenomenon as a matter of concern, one that enrolls a diverse range of allies (including, in this case, skin cancer, loss

of livestock, alien invasions, AIDS, and global economics) these periodicals are able to help motivate various publics into action, into concern. This method of discourse fuses the technical and the scientific with the fullness of social experience. These periodicals are able to not only report on what is happening in our state of affairs, but importantly, they also report on *why* the event should be a concern.

### CLIMATE CHANGE: FACT OR CONCERN?

When articulated as matters of concern, the sociomaterial nature of phenomena, such as the hole in the ozone, becomes evident. The small sample of texts, from the scientific research article to popular periodicals, demonstrates the transformation of a phenomenon from a matter of fact to a matter of concern. From an empirical chemical reaction, the destruction of ozone particles developed into an actor-network enrolling a wide array of allies (including agriculture, global trade, and even the AIDS epidemic). Yet, when compared to another global environmental event, such as climate change, the network of associations pales in comparison. Climate change, physiologically and metaphorically, impacts the entirety of the Earth as a system, as an interconnected Gaia, as our home. How then does climate change transform from a matter of fact to a matter of concern? And how has this shaped public and political action? Next, I will analyze two scientific research articles and three periodicals to examine, much like the ozone hole, the ways in which discourse and language transform phenomena from matter of fact to matter of concern.

In 2015, Carbon Brief, a UK-based website covering a wide range of climate change news and publications, polled a number of climate experts to ask which scientific article in climate science they believed to be the most influential. The scientists selected “Thermal Equilibrium of the Atmosphere with a Given Distribution of Relative Humidity,” by Manabe and Wetherald. Published in 1967, the

article is “the first to represent the fundamental elements of the Earth’s climate in a computer model, and to explore what doubling carbon dioxide (CO<sub>2</sub>) would do to global temperature” (Carbon Brief, 2015).

Manabe and Wetherald’s article serves as preliminary research into the effects of increased carbon dioxide on the planet’s thermal equilibrium. The authors observe that “a doubling of the CO<sub>2</sub> content in the atmosphere has the effect of raising the temperature of the atmosphere (whose relative humidity is fixed) by about 2C” (Manabe and Wetherald, p. 241). Long before the development of sophisticated climate models, the authors refuse to make definitive claims about the effects of several gases in the upper atmosphere, a method common in scientific communication, but continually return to the link between carbon dioxide and increase temperatures. They note that “doubling the existing CO<sub>2</sub> content of the atmosphere has the effect of increasing the surface temperature by about 2.3C for the atmosphere with the realistic distribution of relative humidity and by about 1.3C for that with the realistic distribution of absolute humidity” (p. 254). This focus hints at the tremendous implication of increased carbon dioxide levels in the atmosphere but articulates this phenomenon through the description of the process—as observable, as factual.

Manabe and Wetherald, in similar fashion to the research about the ozone hole, focus on knowledge creation through a full, complete description of the observable process. While most of the effects of climate change had yet to be understood in 1967, the authors stop short of considering the implications of this doubling of carbon dioxide levels. This discourse transforms natural phenomena into objects to understand them. Just as the *Columbia* spacecraft was a “perfectly mastered object” before its destruction, the objective description of scientific discourse aims to craft that perfect object onto the events and processes of the natural world (Latour, 2004, p. 235). Things, as we come

to understand them, are messy in their subjective nature, their ability to be shaped and crafted by perspective and circumstance. Objects, on the other hand, can be boiled down to cause and effect.

Shifting to popular periodicals, the phenomenon of climate change could be addressed cover-to-cover in most publications. From science, politics, to agriculture and current events, climate change, knows no bounds in popular media and is one of the few scientific phenomena to break away from the framing as just a scientific topic. For the ozone hole, this enrollment of diverse allies proved effective in establishing public support, and even fear, by linking the ozone hole with skin cancer and even “AIDS from the sky” (1991). The chemical reaction between chlorine and ozone molecules transformed into a global public health risk as the matter of fact became a matter of widespread concern. Can this work the same for climate change? To trace the complexity of this scientific phenomenon, I examine three articles from the *New York Times*, covering the wide range of this event’s discourse. The articles were published in 2019, and though focusing primarily on climate change, span politics, food, species loss, and our conceptualization of the weather.

### **Article 1: Meat Is a Big Climate Issue. What About Dairy?**

The connection between meat consumption and climate change has been well documented, especially as industrializing nations, such as China, develop a taste for high protein diets. According to the US Department of Agriculture, meat consumption in China increased 28.5% from 2000 to 2010, driven by a booming economy and the luxuries that follow (Zhou, et al., p. 15). This increase in protein intake not only calls for an increase in available cattle, chicken, and pork, but the resources these animals require, such as water, grain, and land for grazing. The World Resources Institute reports that “production of animal-based foods accounted for more than three-quarters of global agricultural land use and around two-thirds of agriculture’s production-related greenhouse gas

emissions” (WRI, 2016). And while high protein diets have been a staple in developed, Western nations for some time, meat consumption continues to rise. In 2018, Americans consumed record high amounts of red meat and poultry (Durisin & Singh, 2018).

In addition to meat consumption, recent research illuminates a link between dairy consumption and climate change. According to the *New York Times*, “the production of dairy products — including milk, cheese, ice cream and yogurt — contributes about 3.6 percent of global planet-warming emissions each year,” surpassing the consumption of pork or chicken (Schwartz et al., 2019). This is because cattle are the most resource-intensive source of protein, requiring the greatest amounts of water, grain, and land—all while emitting methane, a primary greenhouse gas. This has even led some in Australia to push for an increase in kangaroo meat consumption—a much greener source of protein. After describing the effects of meat and dairy on the environment, the article concludes with possible replacements for traditional dairy products, suggesting that “chickpea flour, for example, can be used to make a creamy sauce. And hummus can replace a dairy-based dip at your next party” (2019). From meat to dairy to agriculture to climate change, this article introduces themes of technology, culture, and even economics, as many of the dairy alternatives (chickpeas, soy milk, and various dairy-free products) are notably more expensive than their mass-produced, dairy counterparts.

## **Article 2: How the Weather Gets Weaponized in Climate Change Messaging**

The difference between weather and climate is an important distinction within climate change discourse. While “weather” is understood as day-to-day variations within the atmosphere, “climate” conventionally refer to the thirty-year average of these factors (NSIDC). The difference between weather and climate is often a point of contention between scientists and climate change deniers.

Deniers often cite unseasonably cold days or heavy snowfall as evidence that climate change is a hoax. How can the Earth be warming if it's so cold outside, so goes their logic. One of the most notable instances of such criticism came in 2015 when US Senator Inhofe brought a snowball to the Senate floor, asking: "you know what this is...it's a snowball, from outside here. So it's very, very cold out. Very unseasonable" (Leber, 2018). Using the snowball as empirical evidence against climate change is paradigmatic of this critical, and perhaps purposeful, confusion between the weather and the climate.

When heavy snow hit Washington, D.C. in January 2019, President Trump used a similar strategy, tweeting: "Wouldn't be bad to have a little of that good old fashioned Global Warming right now" (Trump, 2019). *The New York Times* details how politicians, on both sides of the aisle, use the climate debate and are "increasingly using bouts of extreme weather as a weapon to win people to their side" (Plumer, 2019). Plumer observes that "when cold spells strike, Mr. Trump will ridicule worries about climate change" even after months of wildfires and heatwaves—phenomena demonstrative of a warmer climate (2019). Not only has short-term weather become incorporated within the phenomenon of climate change, but it has also become politicized.

Climate change has become an intriguing political issue in the United States. Splitting along party lines, the politicization of climate change transforms the phenomenon from a scientific process and event to a political identity marker, similar to abortion, gun control, and immigration. The history of modern science shows an often-volatile relationship between science and politics. While inherently connected, especially in our contemporary day, the scientific community traditionally seeks to dissociate itself from national politics, seeking objective truth and observation, in contrast to the dangerously social realm of politics. Climate change, however, resists this dissociation, and in step,

perhaps reveals the unique state of affairs of the Anthropocene and how we can no longer pretend to keep separate the natural and the social realms.

### **Article 3: The World is Losing Fish to Eat as Oceans Warm, Study Finds**

The widescale loss of biodiversity is another effect of climate change. Not only is the loss of biodiversity a tragedy in and of itself (roughly 10,000 species of flora and fauna are going extinct each year), but it also poses a threat to global food security (WWF). The *New York Times* connects warming oceans with the loss of consumable fish, noting that the “amount of seafood that humans could sustainably harvest from a wide range of species shrank by 4.1 percent from 1930 to 2010, a casualty of human-caused climate change” (Pierre-Louis, 2019). The article focuses solely on biodiversity loss from warming waters, excluding other factors such as overfishing or pollution. Pierre-Louis reports that “fish make up 17 percent of the global population’s intake of animal protein, and as much as 70 percent for people living in some coastal and island countries,” directly linking biodiversity loss to global food insecurity (2019). Thus, species loss becomes a human concern at our most basic level. Humans and nonhumans are associated together by the effects of climate change—a matter of concern for all the actants of the planet.

Transitioning from food security, the article cites a study detailing the economic impact of the Paris climate agreement. If global warming could be mitigated, fisheries could see “billions of dollars in extra revenue” (2019). Economics has now entered the fray. The article continues that this economic growth “would be in the developing world, where many people rely on fish for protein” (2019). In addition to economic circumstances, we now have geopolitics between the Global North and Global South, where economic inequalities and responsibility for mitigating climate change have been a consistent focus in climate change discourse. How does one brief article begin with the loss

of fish species and end with geopolitical power dynamics? Climate change, as an actor-network, is uniquely capable of enrolling together almost any other actant. This phenomenon, as has been demonstrated by just three articles in one year in one publication, has the ability to invoke an impressively diverse array of associations and rhetorical alliances. Climate change, both literally and figuratively, *touches* everything in our world, and thus, serves as a nexus for any *topoi* a rhetorician, scientist, or journalist could conceive.

Compared to the scientific research article, the *New York Times* articles present a radically different articulation of climate change as a phenomenon. When analyzing a topic or issue from an economic perspective, for example, one would come to radically different conclusions compared to an environmental perspective, or cultural, or medicinal. Latour deems these distinct worldviews, these conceptual frameworks, as unique “modes of existence” or ways of knowing and living in the world (2013). Similar to the periodicals depicting the ozone hole, the *New York Times* articles transform the matter of fact into a concern by calling upon a wide array of allies and associations. But do these allies converge into an orderly army or do they splinter apart? Just as we set out on a path to discuss climate change, as this article suggests, we inherently drag in a plethora of other matters.

### **Too Many Concerns?**

As demonstrated in this analysis of just three news articles, the phenomenon of climate change is widespread, complex, and slippery. Unlike the ozone hole, it is difficult to prescribe a straightforward solution. While dismantling the CFC industry was no small task (and still an ongoing process), the cause and effect of the ozone hole is much more direct, much like the limited agency of the wolf and CFCs from the previous chapter’s analysis. With climate change, carbon dioxide emissions have taken the lion’s share of the responsibility; however, there are still a myriad of other



contributing factors: deforestation, pollution, land development, population growth, and agriculture, to name a few. Seeking to resolve the issue that is climate change is almost like a global-political game of whack-a-mole. Just as one solution is initially formulated, three other problems surface.

Latour and others call for the recognition of phenomena as sociomaterial, advocating for rich and full analyses that examine the cultural and natural actants, refusing any division between the two. This effort, inevitably, leads to research that is messier, more complex, and slower to develop. It's no coincidence that these attributes become the tenets of Actor-Network Theory (ANT), Latour's own approach to analysis. However, when a phenomenon transforms from a matter of fact into a matter of concern, I believe this complexity and fullness can hinder progress, deterring response and effect. When the *Columbia* shuttle was destroyed, when it transitioned from an object into a thing, the "gathering" of actants, of things, certainly increased as a "judicial scientific investigation" began and people searched for an answer (Latour, 2004, p. 235). With climate change, it seems the reverse is occurring, just as Latour observes how, in 2003, the United Nations worked to garner support for the Iraq War and "tried to coalesce, in one unifying, unanimous, solid, mastered object, masses of people, opinions and might" (p. 235). To bring together so many divergent nations, causes, voices, and interests, and to develop these diverse factors into one effect (an attack on Iraq), "the thing was attempting to turn into an object" (p. 235).

This collection of so many concerns, we can say, is a symptom of the current approach by popular periodicals to articulate climate change, due, in part, to the inaccessibility of most scientific writing and research articles. Within the popular periodicals, there is no control over the gathering of things as the phenomenon bleeds into politics, agriculture, entertainment, and even art. The "thingness" of

climate change has grown beyond our capacity to reason, to understand, and most importantly, to respond. Latour observes that:

people are not equipped with the mental and emotional repertoire to deal with such a vast scale of events; that they have difficulty submitting to such a rapid acceleration for which, in addition, they are supposed to feel responsible while, in the meantime, this call for action has none of the traits of their older revolutionary dreams. (2014, p. 1)

Thus, one problem we have encountered when attempting to transform climate change from a matter of fact to a matter of concern is that, through this diverse, full articulation, we have inadvertently created many, many matters of concern. Climate change has become a moving target, an amorphous amoeba, changing in its size, scope, influence, and concern with each new articulation and from each new perspective. Here we have returned to the paradox of relativism. How to speak of the world when reality is constructed through the perception and knowledge-making of the individual, or to broaden the scope, the cultural?

Because climate change is a global phenomenon with global effects, it is impossible to speak of it in solely cultural or nationalistic terms. Climate change transcends geographic borders. Even different fields of scientific inquiry come to understand climate change uniquely, from the large-scale effects of physics to the invisible changes observed by microbiology. With the ozone hole (a global, but not *as global* phenomenon), the entirety of humanity can rally behind the fight against cataracts and skin cancer. We all have skin. Most of us have eyes. In the case of climate change, however, it is much more difficult to articulate the impending impact of sea-level rise to those living thousands of miles

from any ocean. It is difficult to articulate the sweltering heat waves in continental Europe to those in the midst of a winter storm elsewhere across the world.

So, what are we left to do? Do we work to transform the multitude of things into one object, as the UN did in the Iraq War, or do we simply submit to the endless scale of perspectives that is relativism? Perhaps we can avoid having to submit to either option. Through understanding Latour's Antifetishism, perhaps we can see beyond these two options and develop a third approach, what Latour terms the "*fair* position" (2004).

## THE ANTIFETISHISM OF CLIMATE CHANGE

Compared to the *Columbia* disaster or the hole in the ozone, climate change presents a unique paradox when theorized from a Latourian philosophy of matters of fact and matters of concern. In *On the Modern Cult of the Factish Gods*, Latour examines the line drawn by the Moderns between facts and beliefs (2010). From the tradition of Enlightenment thinking, we in the West rely on reason and empirical science to destroy the fabrications or "fairy-objects" of other cultures (p. 3). Latour offers one example of a clash of cultures between the Portuguese and an African tribe on the Gold Coast. When the Portuguese ask if the natives had created their own idols of wood and clay, the natives answer affirmatively. When the Portuguese then ask if these idols are "true divinities," the natives, once again, answer yes (p. 3). But how could this be?

This paradox of the fabricated and the real conflicts, on a fundamental level, with the Modernist mindset. If something is carved by a human hand, how can it hold divine truth? Does not illuminating the social construction of an object automatically derail any claim to truth, to its potential objectivity? Latour goes into detail on this paradox:

Since the Moderns naturally have to come up with an explanation for the strangeness of a form of worship that cannot be justified objectively, they attribute to the savages a mental state that has internal rather than external references... A Modern is someone who believes that others believe. (p. 2)

This is called Antifetishism, or “the prohibition on understanding how one passes from a human action that fabricates, to the autonomous entities that are welcomed by that action and revealed through it” (p. 35). Essentially, Antifetishism strips the symbolic power of an object or phenomenon by exposing its social nature. When the Portuguese encountered the African idols, they denounced them as meaningless since the Natives admitted to making them.

The history of Antifetishism is evident in colonial history and modern science; however, Latour also claims that this iconoclasm extends to contemporary criticism, infesting our academic halls. The contemporary critic, Latour believes, invokes Antifetishism when claiming “that what the naïve believers are doing with objects is simply a projection of their wishes onto a material entity that does nothing at all by itself” (2004, p. 237). Think of the safety a child feels at night with their favorite blanket or teddy bear. The parent may play into this fetishism to ensure the child gets a good night’s sleep, but in the back of their minds, they remain rationally Modern—knowing the blanket is just cloth, the bear only stuffing and fabric. According to Modernism, what power these objects hold lies entirely within the immature, irrational mind of the child, projecting fears and wishes onto an inert, material object.

Or consider a historical example. In the 1870's, the US Army opened the Black Hills of South Dakota to mining. Not only was this area designated Sioux reservation, but also a place of great reverence and history for the Lakota tribe. The Black Hills is the center of the Lakota origin story, where “the *Pte Oyate* Buffalo Nation/People emerged from inside Mother Earth and became *Ikece Wicasa* Common People” (Montes, 2019). To European settlers, however, this region was an untapped resource. One newspaper in 1872 claimed that “the Indians can make no use of the country which has been set apart for them. The pine lands and mineral deposits are of no value to them, because they neither have the knowledge or inclination to utilize them” (Native American Netroots, 2011). These warring perspectives on the Black Hills align perfectly with Latour’s delineation of the difference between facts and beliefs and the deceptive manner in which the Moderns justify their ontology. For too long, Latour believes, critics and academics have followed a similar strategy to reveal the factual nature of these things, transforming them to objects of study. The Modernist critic would say no—the Black Hills are not imbued with the spirits of the Lakota people, there’s simply no observable method to prove this—rather, they are Precambrian granite, pegmatite, and other metamorphic rock formations caused by uplifting from volcanic activity. Through Enlightenment-style thinking, the Black Hills become a matter of fact, and as such, can be understood as a resource ripe for mining, logging, and other capitalistic endeavors.

The genius of the Modernist mindset, and contemporary critique, lies in the two moves of Antifetishism, the denunciation of others’ idols and the protection of one’s own. Latour sardonically praises this process at length:

When naïve believers are clinging forcefully to their objects, claiming that they are made to do things because of their gods, their poetry, their cherished objects, you can turn all of

those attachments into so many fetishes and humiliate all the believers by showing that it is nothing but their own projection, that you, yes you alone, can see. But as soon as naïve believers are thus inflated by some belief in their own importance, in their own projective capacity, you strike them by a second uppercut and humiliate them again, this time by showing that, whatever they think, their behavior is entirely determined by the action of powerful causalities coming from objective reality they don't see, but that you, yes you, the never sleeping critic, alone can see. Isn't this fabulous? (2004, p. 239)

From this tradition, science and the Moderns consistently reveal the role of the social to weaken an object or belief. The US Army and settlers reduced the Black Hills to a pile of resources. The parent (perhaps unwisely) may reveal the blanket or teddy bear as nothing more than cloth and fabric. These become Objects of the world—capable of being understood through empiricism and reason. This is Antifetishism. The teddy bear is more *real* when you strip it of a child's fantasy. The Black Hills become more *real* when you strip away the Lakota's ancestral spirits. This allows the Moderns to neatly organize each of these objects as either cultural (fabricated) or natural (real). A phenomenon can be cultural or natural, but never both.

Climate change, however, presents a unique complication to this way of thinking about and understanding the world. Without going so far as to prescribe to the beliefs of climate deniers, how are we to situate such a phenomenon that conjoins the social and the natural? What makes climate change *real* is its anthropogenic origins, the many manifestations of the “social” (carbon emissions, deforestation, ocean acidification) in disrupting these “natural” systems. While the hole in the ozone was also a result of social processes, it is much easier to translate into a matter of concern for two primary reasons. First, as analyzed in chapter two, the perpetrators of the ozone hole, CFCs, remain

firmly an object, the manufactured, that which we care little for. Secondly, the hole in the ozone is a much more direct concern with a traceable cause and effect. The hole in the ozone, caused by CFCs, can cause skin cancer and death. This wolf has been nearly hunted to extinction. Climate change, on the other hand, presents a multitude of concerns (perhaps too many) and complicates the cultural/natural division of Modernism. It is Latour's hybrid. It is Haraway's cyborg. It is Mol's multiple ontology. Climate change challenges the Modernist method of organizing the world that has dominated since the European Enlightenment and forces us to consider the intersection of the cultural and the natural.

This, I argue, is a key reason why our global society has had such difficulties responding to climate change. The tradition of Enlightenment-era science, progress, and reason, all fail in the face of this existential threat. Science tells us how objects and phenomena work and function, but that is not the entirety of the story. Empirical evidence only takes us so far until we are forced to determine *how* to respond to these drastic changes in the Earth's systems. In 2019, it is difficult to deny the mountains of empirical data. The surface temperature of the Earth is steadily rising. That is resolved. Now, in our wealth of information and technology, we are left to wonder: now what are we going to do about it?

## CONCLUSION

Climate change is a unique phenomenon—one that gains strength through its sociomaterial construction and relations, and yet, is in part diminished by an overextension of this network. If climate change is all things at once, then what is it? As demonstrated by the analysis, climate change is a difficult phenomenon to pin down and respond to when it is political, economic, agricultural, scientific, and social—all at once. As we know, it is hard to hit a moving target (even one as slow

moving as climate change). This global phenomenon, then, may require us to move beyond matters of fact and matters of concern. Articulated as a matter of fact, climate change is cold and descriptive, reduced to surface temperatures graphs (even ones as alarming as the infamous hockey stick curve) and chemical reactions. As a matter of concern, climate change expands perhaps *too much*—embodying political parties, artistic movements, polar bears, farmers in Africa, calving glaciers, solar power technology, the Vatican, the automotive industry, human morality, and the list goes on... When climate change becomes such a multitude of concerns, it is much more difficult to rally public support and translate that support into action. If, on one particular day, I choose to frame climate change as an automotive industry problem, I may purchase a hybrid-electric vehicle. While this is an environmentally-friendly decision (at least in terms of purchasing a vehicle), it does nothing to address human population growth, biodiversity loss, or the hundreds of new coal-powered plants still being built in China.

To address the dualism of matters of fact and matters of concern, Latour offers a third option, the *fair* position, a new critical tool inspired by Alfred North Whitehead and Martin Heidegger to bring us closer to the actants and events of our world. Latour sees Whitehead's philosophy as a rare one that, through critical analysis, actually enhances a matter of fact rather than diminishing it like the iconoclasts of critical theory. Whitehead notes that in science, "everything perceived is in nature. We may not pick up and choose. For us the red glow of the sunset should be as much part of nature as are the molecules and electric waves by which men of science would explain the phenomenon" (pp. 28–29). The sunset is not just molecules and waves and it is not just human perception and emotion. It is the unique hybridization of both aspects. To use Heidegger's terminology, it is a *gathering* of these aspects, a moment where "participants are gathered in a thing to make it exist and to maintain its existence" (Latour, 2004, p. 246). The gathering, as a paradigm for this new *fair* position, can help



us account for the full range of actants, both human and nonhuman, scientific and social, that compose our current state of affairs. By viewing phenomena as such, Latour hopes this will reengage criticism with a positive air—one of enhancement, rather than diminution. From there, Latour concludes, “we could let the critics come even closer to the matters of concern we cherish” (p. 248).

Even if we begin to let the critics close to our matters of concern, can we be sure that this revived criticism will lead to real action in the world? Latourian philosophy brings much to the table and provides refreshingly new tools to engage our contemporary world. However, we are still left with the grand paradox that makes climate change so slippery and such a “wicked” problem. If we make climate change a fact, in hopes that we can swiftly and directly take action (think Desert Storm or the ozone hole), then we reduce climate change to a technical problem, one of surplus greenhouse gases in our atmosphere. If we understand climate change solely in this way, then we lean toward a technical answer, which overwhelmingly has been renewable energy sources. Even with a complete shift to renewables, we do nothing to address species loss, pollution, or human population growth. If we make climate change a concern, it quickly expands beyond the human ability to understand and react. It, indeed, weakens the phenomenon by spreading its network so wide. To respond to climate change, perhaps we need to transform this vague, all-encompassing phenomenon into separate, specific matters of concern. Climate change as a “catch-all” for every environmental issue serves only to weaken social response.

Mustering the will, collaboration, and resources of the global community to respond to climate change is no easy task. Unlike the hole in the ozone, this environmental phenomenon presents a shifting target. Climate change is an event unlike any other in human history, one that registers on the political, the economic, the technical, the social, and many other levels. Because it is such a far-

ranging phenomenon, there is no simple solution. There is no one approach. Scientists may claim that we can fix climate change because we have the technology to shift to renewable energies and dramatically reduce our carbon emissions throughout the world. However, from a sociomaterial perspective, from a perspective that sees climate change as more than just a fact (but also a concern), one would have to reject this claim. We cannot fix climate change because we have yet to. This may seem paradoxical, but simply having the technical resources to address a problem is not the same as actually solving it. Through the lens of the rhetoric of science and Latourian philosophy, it becomes clear that we need both technical ability and social will. Yes, we may have the tools to reduce carbon emissions, but that is not the entirety of what we need to respond to this sociomaterial phenomenon. We also need the hands, willing ones at that, to understand and use those tools.

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# Chapter 4: Actor-Network Theory and the International Solar Alliance

## INTRODUCTION

The 1987 Montreal Protocol and the 1997 Kyoto Protocol represent two of the world's most ambitious and globally-inclusive attempts to undo the damage humanity has wrought upon the natural environment. Both these international accords represent rare moments in history when the global community not only recognized the need to protect the environment, but united to respond to the environmental threats. Like the Treaty of Paris or the Treaty of Versailles, these protocols indelibly changed history, and as such, serve as rhetorical flashpoints for the analysis of political and civic discourse on climate change. They are not only important historical moments, but important rhetorical flashpoints for research and examination and to help us understand our relationship with the natural environment.

As examined in chapters two and three, the Montreal Protocol has been heralded as a widespread success, while the Kyoto Protocol, in comparison, has failed in its primary aims of curbing worldwide carbon emissions. Not only has the Kyoto Protocol failed, but carbon emissions have continued to rise steadily. Despite efforts from UN member-states around the globe, carbon emissions not only rose, but “world emissions of the greenhouse gas carbon dioxide increased three times faster after 2000 than in the 1990s” (Zabarenko, 2007). *Carbon Brief* reported that, despite relative success in curbing carbon-dioxide emissions over the last few years, emissions rose by 2% in 2017 (Hausfather, 2017). And in 2018, carbon-dioxide emissions reached an all-time high at 37.1

billion metric tons (Harvey, 2018). Clearly, finding a method to mitigate global carbon emissions is still a problem that is far from resolved.

In a second attempt to address global carbon emissions, world leaders met in Paris to design a new environmental accord—learning, hopefully, from the inherent flaws of the Kyoto Protocol. Winkler, a Swiss economist, noted that “Kyoto helped lay the groundwork for current global efforts to address climate change,” but could never be expected to significantly curb carbon emissions because the standards only applied to developed countries, excluding major emitters such as China and India (Poppick, 2017). However, the Kyoto Protocol was not an entirely fruitless effort. Many note that, despite the fact that carbon emissions continue to rise, the Kyoto Protocol “was useful in setting all sorts of standards...it got everyone on the same page” and formalized the goals of addressing climate change (2017).

Ratified in 2016, the Paris Agreement (PA) was signed by 195 UN member-states and designed to mitigate carbon emissions by transitioning to renewable energy, providing financial support for developing countries, and establishing a network for sharing and disseminating emerging technologies (UNFCCC, 2018). Initially met with applause, the PA has already encountered widespread criticism and obstacles; the most prominent being Trump’s 2017 announcement of the US’s plan to withdraw. However, despite criticism and setbacks, the PA remains the most comprehensive and ambitious plan-to-date to tackle carbon emissions and climate change. Never before have so many countries signed onto one accord, and despite the possible US withdrawal, the inclusion of other top carbon emitters, such as China, India, and Russia, signifies the potential for real change. Additionally, the financial commitment already made by signatories far exceeds the

Kyoto Protocol. According to the BBC, the Green Climate Fund, the financial mechanism of the PA, has seen significant contributions:

US - \$3bn

Japan - \$1.5bn

UK - \$1.2bn

France - \$1bn

Germany - \$1bn

The PA is currently, for better or worse, the most significant piece of environmental legislation, in terms of financial commitments, aimed at combating the effects of climate change. In step with the Montreal and the Kyoto Protocols, the PA serves as a flashpoint for our values, our scientific knowledge, our economic capabilities, our global relations, and the discourse shaping these phenomena as they manifest on the world stage. Many believe this is also our last chance at ensuring the survival and flourishing of life on this planet. UN secretary general, Antonio Guterres, argues that wasting the opportunity provided by this environmental accord “would not only be immoral, it would be suicidal” (Sengupta, 2018).

The PA is an ambitious agreement between every member-state of the UN. From its core purpose of limiting the global temperature increase to 1.5 degrees Celsius, the PA is enacted via several mechanisms, including a joint climate fund, renewable energy technology, and a global framework for planning and responding to the many effects of climate change, such as sea-level rise and severe weather activity. For the purpose of this analysis, I selected just one component of this wide-ranging environmental treaty to allow for a more in-depth account of how various actants interact and



engage in actor-networks. While this analysis examines only a small part of the overall impact and goals of the PA, it is designed to be demonstrative of the rhetorical strategies found in the political and civic discourse of environmental treaties.

For this final analytical chapter, I use Actor-Network Theory (ANT) to trace the creation of the International Solar Alliance (ISA), a key component of the PA, led by India's commitment to turn away from fossil fuels by implementing 100 gigawatts of solar energy by 2022 (Koch, 2014). Such an event could be understood through a variety of lens and frameworks, such as economics, politics, or even colonialism. However, I believe ANT to be a productive approach because, when analyzing complex phenomena, especially those which incorporate human and nonhuman actants, ANT allows for a full, comprehensive analysis by letting the actants speak for themselves. Rather than seeking only to provide an explanation for the event (showing how the solar deal represents post-colonial bullying by the West to ensure that a developing nation sacrifices for the common good), ANT encourages a careful description of the interactions and relations between the individual actants to "learn from them what the collective existence has become in their hands" (Latour, 2005, p. 12).

Latour argues that there are no ready-made answers and that abstract, social explanations only reveal so much about a given event or phenomenon. Examining only the social actants leaves out a litany of influential factors that, in our anthropocene, have all entered the political realm. Morton concurs that "all kinds of beings, from toxic waste to sea snails, are clamoring for our scientific, political, and artistic attention, and have become part of political life" (p. 17). Thus, we can observe how what may have once been traditionally seen as a social event, such as a political treaty or agreement, is actually informed and shaped by the rhetorical agency of nonhumans. To stop short an analysis with

a social abstraction is not necessarily incorrect, but this type of analysis does oversimplify our world and miss opportunities for more complete and complex analyses.

For example, in Al Gore's follow-up to *An Inconvenient Truth*, his second documentary focuses on the role he played in sealing a technology deal between SolarCity and India. The film depicts Gore negotiating with SolarCity executives, including Elon Musk, and Indian politicians in Paris. The documentary even suggests that this deal served as the impetus for India ratifying the PA. But does such a critical event (this first step in the massive restructuring of the energy industry for the world's third most populous country), really boil down to Gore as "climate crusader," fighting to show Modi and India the light, all the while aided by Musk as his tech-wiz sidekick? (Pal, 2015). These types of analyses certainly make for compelling narratives, and additionally, they help to simplify and make digestible complex events. But ANT pushes us to avoid these ready-made narratives, these shortcuts, these easily-digestible answers. Instead, ANT pushes our analysis to the ground floor to carefully follow and examine the actants, both human and nonhuman, to see how they interact and come to create our world.

## THE 2015 PARIS AGREEMENT

Following the failure of the 1997 Kyoto Protocol, the world once again gathered to address the unceasing rise in carbon emissions. In 2015, nearly every nation met in Paris as a part of the United Nations Framework Convention on Climate Change (UNFCCC) to design a multilateral agreement aimed at addressing greenhouse gas emissions through mitigation, adaptation, and financing. Per the UNFCCC, the PA:

builds upon the Convention and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort. (2018)

Specifically, the goal of the PA is to maintain “a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius” (2018). To achieve this goal, some key tenets of the agreement include: financial support for developing countries, a transparency framework for action and development, and open access to renewable energy technology. Like the Kyoto Protocol, the PA recognizes the unique circumstances and capabilities of each UN member nation, specifically the divide between developed and developing nations. Thus, this environmental treaty aims to provide financial and technological support to nations that might otherwise burn cheap fossil fuels to rapidly develop.

The PA was signed on Earth Day, 2016, and entered into force in November of that year, following the double-threshold, or the “ratification by 55 countries that account for at least 55% of global emissions” (2018). This level of commitment was deemed necessary to show a significant level of support for the new legislation. In its final manifestation, the PA combats climate change via twelve key aspects:

1. Long-term temperature goal

- “limiting global temperature increase to well below 2 degrees Celsius, while pursuing efforts to limit the increase to 1.5 degrees”

## 2. Global peaking

- “Parties aim to reach global peaking of greenhouse gas emissions (GHGs) as soon as possible, recognizing peaking will take longer for developing country Parties”

## 3. Mitigation

- “establishes binding commitments by all Parties to prepare, communicate and maintain a nationally determined contribution (NDC) and to pursue domestic measures to achieve them”

## 4. Sinks and reservoirs

- “encourages Parties to conserve and enhance, as appropriate, sinks and reservoirs of GHGs”

## 5. Voluntary cooperation/Market and non-market based approaches

- “recognizes the possibility of voluntary cooperation among Parties to allow for higher ambition and sets out principles – including environmental integrity, transparency and robust accounting”

## 6. Adaptation

- “establishes a global goal on adaptation – of enhancing adaptive capacity, strengthening resilience and reduction of vulnerability to climate change”

## 7. Loss and damage

- “enhances the Warsaw International Mechanism on Loss and Damage, which will develop approaches to help vulnerable countries cope with the adverse effects of climate change”
8. Finance, technology, and capacity-building support
- “reaffirms the obligations of developed countries to support the efforts of developing country Parties to build clean, climate-resilient futures, while for the first time encouraging voluntary contributions by other Parties”
9. Climate change education, training, public awareness, public participation and public access to information
- “to be enhanced under the Agreement”
10. Transparency, implementation, and compliance
- “relies on a robust transparency and accounting system to provide clarity on action and support by Parties, with flexibility for their differing capabilities of Parties”
11. Global Stocktake
- “to take place in 2023 and every 5 years thereafter, will assess collective progress toward meeting the purpose of the Agreement in a comprehensive and facilitative manner”
12. Decision 1/CP.21
- “sets out a number of measures to enhance action prior to 2020.” (UNFCCC, 2019)

As of November 2016, 195 member-states of the UNFCCC have signed the PA, which makes it, along with the Montreal Protocol, one of the most universally adopted pieces of international legislation. UN Secretary-General, Ban Ki-moon, observed that “today is a historic day... this is by far the largest number of countries ever to sign an international agreement on a single day” (UN News, 2016). In just one day, 175 member-states signed the PA, and rightfully so, enthusiasm was high. French President Francois Hollande urges other nations to follow, determined to lead the way: “France should be an example to show that it wants to be the first – or one of the first – not just to ratify but also to implement the contents of the Agreement” (2016). Even US actor Leonardo DiCaprio was on hand at the PA, applauding the resolution and encouraging action. He noted the importance of this historic meeting, claiming that “this is the only body that can do what is needed” (United Nations, 2016).

However, despite the host of powerful actants gathering in support and applause of this historical treaty, it did not take long for initial enthusiasm to wane as the reality of this ambitious project began to materialize. Almost immediately, critics began poking holes in what they saw as an international treaty without any teeth. *National Geographic* reports that “if action to combat climate change is limited to just current pledges, the Earth will get at least three degrees Celsius (5.4 degrees Fahrenheit) warmer by 2100 relative to preindustrial levels,” far above the levels hoped for in the agreement (Greshko, 2017). Some note that “emissions reductions are barely on the table at all. Instead, the talks are rigged to ensure an agreement is reached regardless of how little action countries plan to take” (Cass, 2015). Even James Hansen, NASA scientist and one of foremost climate change experts, believes the PA is “a fraud really, a fake...it’s just worthless words. There is no action” (Milman, 2015).

Perhaps the greatest challenge to the PA came on 4 August 2017, when newly-elected US President Donald Trump announced his country's withdrawal. Trump noted that, while the US is withdrawing, he hopes to "begin negotiations to re-enter the Paris Accord or a really new transaction on terms that are fair to the United States," which, without any specifics, signifies very little in terms of real action (Trump, 2017). And while, following Trump's speech, outrage spread across the globe, it's important to take into account the progress of the nations still, verbally, at least, bound to the agreement. In 2018, the *New York Times* reported that "many large emitters aren't even on track to meet their self-imposed targets" (Plumer & Popovich, 2018). *Euractiv* noted that, in October 2018, just ahead of the UN climate conference COP24, only 16 out of the 197 countries "have defined national climate action plan ambitious enough to meet their pledges" (Stam, 2018).

## THE INTERNATIONAL SOLAR ALLIANCE

To provide focus, I chose one key part of the PA, the establishment of the International Solar Alliance (ISA), to analyze. Launched by France and India, the initiative aims to cultivate solar energy in developing countries through financial aid and open access to technology. While launched at COP21 (the PA) in 2015, the ISA was officially signed and ratified in 2016 at COP22 in Marrakech, Morocco. To date, 122 UN member-states have signed the treaty, and while any UN member-state is welcome to join the alliance, what makes the ISA unique is its emphasis on geography. The ISA is led by countries within the torrid zone—the region between the Tropic of Cancer and the Tropic of Capricorn. Only countries within this region are designated voting members of this alliance. In this way, traditional global powers, such as the US, France, Russia, or the UK, can only support, not lead, this initiative to develop renewable energy. I analyze the formation of the ISA, not as representative of the PA as a whole, but because it provides clear evidence of the rhetorical impact

of nonhuman actants and how they shape and drive social events. Additionally, the ISA can be seen as a microcosm of environmental treaties, as geopolitics, funding issues, the role of technology, and historical relationships all manifest in the creation of this alliance.

The ISA is one of the largest renewable energy development plans in history, with goals to “mobilize more than 1,000 Billion US Dollars of investments... by 2030 for the massive deployment of affordable solar energy” (UNFCCC, 2015). No other alliance has attempted such an audacious and large-scale investment in renewable energy. But how did this landmark treaty actually form? There are many scientific and technical factors to investigate, such as climate change as a global exigence, the availability of sunlight in the torrid zone and recent advancements in solar technology. There are also important social factors, including India’s economic development, France’s financial support, the rare collaboration of world countries at COP21 and the history of colonialism between the Global North and the Global South. However, to gain a more comprehensive understanding of the development of the ISA, one must incorporate all these factors, all of these phenomena and actants, into one vast collective. That is why ANT is a useful tool, as it emphasizes the role of all actants involved, including those that are nonhuman, such as solar radiation, photovoltaic cells and the city of Paris. To analyze the creation of this alliance, I use ANT to follow the actants closely, using a multi-genre corpus of texts to trace how the ISA developed through rhetoric and discourse.

## A SOCIOLOGY OF TRANSLATION

In his analysis of declining scallop populations in St. Brieuc Bay, Callon frames ANT as a “sociology of translation” (p. 106). For Callon, ANT “is particularly well adapted to the study of the role played by science and technology in structuring power relationships” as it incorporates the agency of nonhuman actants and resists ready-made, purely social explanations for phenomena (p. 196). To



structure his approach, Callon breaks the sociology of translation into four stages: problematization, *interessement*, enrollment, and mobilization (p. 196). To begin, I briefly define each stage and apply it to the ISA. Then, I more closely examine of how both human and nonhuman actants mediate one another to form this solar alliance.

### 1. Problematization

The first stage is an agreement of sorts between actants. Defined as problematization, the first stage occurs as certain actants “become indispensable to other actors in the drama by defining the nature and the problems of the latter and then suggesting that these would be resolved if the actors negotiated” (Callon, p. 196). Essentially, problematization refers to a moment when actants come together within a common reality and identify a common problem. Upon identification of this problem, the various actants determine that it is advantageous to work together. For the PA, this moment came as the many faults of the Kyoto Protocol materialized and carbon emissions continued to rise. Not only were some major emitters not bound by the standards of the treaty, including developing nations (China and India) and some nations that simply left the agreement (US and Canada), but those still a part of the Kyoto Protocol were also failing to meet their goals of reducing emissions. In a 2017 study on the effectiveness of the Kyoto Protocol, Almer and Winkler discovered that “15 of the key countries involved have not demonstrated any real change in behavior as a result of their commitment” (Poppick, 2017). Despite the varying success of individual countries’ commitments, the *Guardian* reported that “global carbon emissions will jump to a record high in 2018” (Carrington, 2018). Clearly, there is still work to do in addressing carbon emissions and climate change.

For the ISA specifically, this came years before the PA when India began investing heavily in solar energy and recognized that “India should take initiatives towards forming a league of nations on the line of OPEC for solar power” (Firstpost, 2012). After some early success, including a 500 MW solar park, “the biggest of its kind in Asia,” it would not be until 2015 that other global leaders, such as France, would help to formalize the alliance, perhaps realizing that one country’s investments in solar energy would not be enough (2012).

## 2. *Interessement*

The second stage can be understood as “the group of actions by which an entity...attempts to impose and stabilize the identity of the other actors it defines through its problematization” (Callon, p. 203). The unique word choice for this second stage represents the need for actants “to be interested,” “to be in between,” “to be interposed” with one another—essentially, the need for common ground (p. 203). Callon notes that “to interest other actors is to build devices which can be placed between them and all other entities who want to define their identities otherwise” (p. 204). This occurs in the development of the ISA as various actants negotiate their needs to reach an agreement. The ISA mission statement cites “unprecedented opportunity to bring prosperity, energy security, and sustainable development” to the “solar resource rich countries” of the torrid zone (ISA). This unites the interests of economics, security, and sustainability, with a unique focus on regions receiving plentiful solar radiation. Thus, as I discuss in more depth later, the elliptical shape of the Earth and solar radiation itself become actants with important interests.

## 3. Enrollment

Since *interessement* cannot ensure actants actually succeed in coming together, the third stage “designates the device by which a set of interrelated roles is defined and attributed to actors who

accept them” (Callon, p. 206). This occurs as actants “anchor themselves to the collectors” and begin to formalize the network (p. 211). For the ISA, and other instances of environmental legislation, this formalization occurs as treaties are signed and ratified. One specific example is the financial commitment by France to commit 700 million euros (Varadhan, 2011). Enrollment, however, does not always imply progress, as actor-networks may break apart when actants betray the initial goals of the problematization. In 2017, US President Trump formally announced the departure of the US from the PA. While the US, like any other nation, cannot formally leave the PA for at least four years, the “departure of the Earth’s second-largest polluter was a major blow” rhetorically, at least, for the project of the PA (Plumer, 2017). In fact, Trump’s withdrawal has sent a ripple effect among other actants, as Moritz-Rabson reports that Australia is considering a withdrawal and Poland, too, questions its commitments (2018).

#### 4. Mobilization

The final stage is “a set of methods used by the researchers to ensure that supposed spokesmen for various relevant collectivities were properly able to represent those collectivities” (p. 196). For the ISA, this is ongoing, as various nation-states work to ensure that the promises of the treaty are met and its goals are achieved. The most prominent point of mobilization for the ISA and the PA has been the 2018 COP22 conference in Poland. As a follow-up to the PA, this meeting “established rules for tracking and reporting individual nations’ greenhouse-gas emissions and climate policies” (Tollefson, 2018). While it is still too early to measure the success of these moments of mobilization, it is important to recognize that this is an ongoing process—the battle is never finished, the alliance is never entirely secure. ANT highlights the mercurial nature of phenomena in this way, pointing toward the continual need to mobilize actants toward the common goal.

Now that we have outlined the four stages of translation, we can begin following the individual actants as they meet, interact, and work to formalize their interests of mitigating carbon emissions and confronting climate change. ANT advocates that we move closer in our analysis and “follow the actors themselves” for a more honest and comprehensive understanding of these institutions (p. 179). For what really is an institution other than a collection of individual people, objects, and interactions? Latour notes that “whenever anyone speaks of a ‘system’, a ‘global feature’, a ‘structure’, a ‘society’...the first ANT reflex should be to ask” ‘In which building? In which bureau? Through which corridor is it accessible?’” (p. 183). Thus, I attempt to understand the formation of the ISA in a close and specific analysis. Traced through a multi-genre corpus of texts, I follow the actors to see how they interact, what they have to say, and how they came together in contingent alliances to produce the ISA.

## THE FORMATION OF THE ISA

A traditional analysis may begin with Modi’s early proclamation for an “OPEC for solar power,” but in 2012, this is merely one of the first *social* articulations of the ISA (Firstpost, 2012). The foundation of this solar agreement lies in the physical relationship between our planet and the sun. Due to our planet’s elliptical shape and the tilt of its axis (23.5 degrees), different parts of the Earth receive different amounts of *insolation*, or incoming solar radiation. From the “orientation of the Earth’s poles relative to the Sun” the equatorial zone receives far more insolation than higher latitudes (NASA Jet Propulsion Laboratory). This distribution of energy throughout the planet has far-reaching effects and is a primary driver of many of the Earth’s natural systems, including seasonal variations, wind patterns, and the distribution of flora and fauna.

Receiving the most insolation, the equatorial zone reaches from the Tropic of Cancer to the Tropic of Capricorn. This zone covers 36% of the world's landmass and is home to roughly a third of the world's population, including nations such as Brazil, India, Australia, and most of Africa (National Geographic). Historically, there has been little to unite such diverse nations and populations; solar radiation, however, may provide that opportunity, that moment of *interessement*. In 2015, Modi refers to these countries as “*suryaputra*, or sons of the sun” (Wall Street Journal, 2015). By highlighting this technical fact (the high amount of insolation), Modi works to unite a diverse range of nations and populations. A seemingly non-political actant, incoming solar radiation becomes a force to mediate a social alliance.

Of course, insolation itself, as a solitary actant, can only accomplish so much. What makes solar radiation a powerful actant, and the foundation of the ISA, is, in part, its translation to solar energy, which is then translated by the ISA into “prosperity, energy security and sustainable development to their peoples” (2012). Translation can be understood as a “concept that bridges the gap between the varied aspects that are combined in technology” (Cressman, p. 9). Solar radiation becomes a technology which is translated into a catalyst for a wide range of social and environmental benefits. Without the specific material relationship between our planet and the sun, none of this is possible. This focus on the intersection of interests between actants, and the resulting enrollment, is an essential move of ANT. It's similar to the work done by an article in *Newsweek* that translates the PA into a “health treaty” (Neira, 2018). In addition to the environmental benefits of decreasing carbon emissions, Neira allies these goals with human health benefits, noting that as cities improve transportation methods, “not only can they reduce carbon dioxide emissions and air pollution, but also decrease traffic injuries and encourage increased physical activity” (2018). Thus, the call to curb

carbon emissions is no longer just about saving the polar bears in the distant Arctic—rather, it’s become localized and socialized.

Environmental politics, including the politics of the ISA, are often reduced to key human actants, such as politicians and activists. Spearheaded by France and India, the ISA is often depicted as an agreement between Indian Prime Minister Modi and French President Hollande, later taken up by French President Emmanuel Macron. Many of the news images depicting the ratification show Hollande/Macron and Modi smiling, engaged in friendly handshakes. *Reuters* describes the ISA as an organization launched by Modi and funded by Hollande, an investment currently “at one billion euros” (Varadhan, 2018). This articulation of the ISA, as an agreement between two prominent heads of state, can be read in several ways: political, economic, social, even personal. Following the successful ratification, Macron credits Modi by saying: “Mr. Prime Minister you made a dream and we did it” (Hyams, 2018). But, of course, Macron and Modi are only two of the actants engaged within this actor-network—important as they may be. In a tweet, Hollande declares that “we make Delhi this weekend the world capital of the sun. Through our presence, we seal an alliance to make the energy of the sun accessible to everyone” (*The Economic Times*, 2018). Modi reiterates the importance of their alliance, responding that “we did not come from all continents to deliver additional speeches that will soon be forgotten. We came to ask the topics on the table and give access to solar energy in the world” (2018).

Articulating the ISA as an alliance between two human actants reduces the complexity of this phenomenon, this event, this actor-network, into a mere handshake. What we lose are the complex and numerous enrollments, made possible through *interesement*, that led to the possibility for such an environmental agreement to come into existence. Essentially, this articulation becomes a rhetorical

synecdoche—replacing the whole for a part. During the early days of the PA, Aggarwal and Roche report that Modi would “launch [the] solar alliance” which is “being seen by analysts as a strategic step for the country on the global stage” (2015). Here, Modi represents India, progress, renewable energy, combating climate change. But that does not leave us with an accurate understanding of the Indian Prime Minister as an actant within this complex state of affairs as it substitutes the man himself for the social abstractions that he is allied with. According to Latour, the social cannot be “constructed as a kind of material or domain...comparable to other terms like ‘wooden’ [or] ‘steely’ (2005, p. 1). The social is not “stuff,” but rather, per ANT, a “trail of associations” that reveals the materialization of things and events in the world (p. 5).

Reducing the ISA to an agreement between Hollande/Macron and Modi results in an oversimplified and incomplete understanding of what makes up this phenomenon. This rhetorical synecdoche overlooks the fact that India remains “the world’s third largest emitter” of greenhouse gases and faces the task of providing basic electricity to a ballooning population (Koch, 2014). While India’s investment in solar energy is a critical part of mitigating carbon emissions, it cannot be ignored that India “has the largest number of poor people” in the world and still heavily relies on coal, which “accounts for 59 percent of India’s electric capacity” (2014). This is not to simply criticize the success of Modi, Hollande, and the ISA. Rather, by digging into the complex, which can often be messy, we can better understand the entire range of actants involved.

### WHY MOVE LIKE AN ANT?

If the ISA is not, in fact, made of the social, then what is it made of? ANT recognizes the social as comprised of far more than human individuals, their discourse, their actions. If there is “some trial that allows someone to detect the difference” made by an actant, then it should be considered

(Latour, 2005, p. 71). ANT practices a flattened ontology, one in which a wide range of nonhumans (animals, objects, institutions, ideas) is included within the analysis. Brought together, these actants “form temporary networks, creating assemblages of relations specific to an individual act or broader event and forming a collective” (Potts, p. 286). This makes the ISA a temporary network incorporating a truly global range of diverse actants (the UN, Paris, carbon-dioxide, world governments, airplanes needed by the attendees, even Leonardo DiCaprio) working toward a specific goal. The eventual success or failure of this goal is determined by the continued mobilization of the various actants.

Mobilization, as the final stage of Callon’s sociology of translation, is critical as it determines the long-range impact of a phenomenon. All actor-networks are temporary alliances, capable of being dissolved just as quickly as they were formed. As Latour notes, actants can betray their original alliances. For an environmental treaty, such as the ISA, this is crucial because simply switching to solar power, or reducing carbon emissions by other means, for a short time will not keep global warming to 2 degrees Celsius (the stated goal of the PA).

ANT, as an analytical tool, also admonishes us to resist the urge to explain phenomena. Instead, ANT allows the actants to speak for themselves. Latour notes that “ANT does not tell anyone the shape that is to be drawn—circles or cubes or lines—but only how to go about systematically recording the world-building abilities of the sites to be documented or registered” (1999, p. 21). This method of description, in lieu of explanation, “refers to an empirical tracing of the entire range of mediators—human and nonhuman—that support a particular and localized cultural activity” (Holmes, p. 426). This is a crucial distinction in epistemological terms because “description means avoiding the reproduction of conventional topoi and discourse to explain a particular rhetorical



situation” (p. 427). In these terms, ANT becomes more of a tool, less of a set of theory-laden blinders. For this analysis, the ISA functions as part of a broader network to be analyzed and understood through the movements of specific actants. By using social explanations, such as economics (the solar panels cost too much), colonialism (this is an instance of the West asserting historical-colonial power over India), or morality (acquiring the solar panels was the *right* thing to do), we realize only one, narrow mode of existence for the phenomenon. Through careful description of the actants, we can “learn from them what the collective existence has become in their hands” (Latour, 2005, p. 12).

One common example of the social explanation in environmental discourse is climate colonialism. In discussing the PA, Galvao argues that the “appropriation of carbon space for the enrichment of some and the impoverishment of others” can be understood as a new form of colonialism (2015). This harkens back to a long and unjust history between the Global North and the Global South—a geographical divide that has been the focus of climate change discourse as developing nations ponder why they, too, must bear the burden of cleaning the atmosphere that was primarily polluted by developed nations in Europe and North America. This schism between the Global North and the Global South is one of the most prominent barriers in climate action, leading to the burden of responsibility, which most often materializes as funding, being thrown back and forth between developed and developing nations.

But what advantage does this offer? While conceptualizing the PA as climate colonialism may reveal a modern manifestation of a long and troubled history between nations, this primarily pulls actants apart, rather than bringing them together. The enrollment and mobilization of actants is hamstrung by such ready-made explanations.

## CONCLUSION

This analysis describes the ISA as it manifests through the problematization, *interessement*, enrollment, and finally mobilization, of various human and nonhuman actants. To analyze the ISA, it is not enough to follow the discourse of prominent politicians, such as Macron or Modi. Rather, we should incorporate the agency and roles of a broader range of actants, including nation-states, solar energy technology, and even the angle of the Earth's axis. Through this type of analysis, we can see the formation of the ISA as contemporary, nonmodern phenomenon, one that reunites the cultural and the natural. Rather than assigning phenomena a natural (real) or social (constructed) designation, we can understand phenomena as hybrids, those which highlight “the multiple links, the intersecting influences, the continual negotiations” of our world (Latour, 1993, p. 13).

To understand the formation of the ISA as strictly social or strictly technical fails to account for the “intersecting influences” of the full range of actants (p. 13). Even individual actants can be understood as hybrids. Consider solar radiation. In a technical sense, solar radiation can be defined as “radiant energy emitted by the sun from a nuclear fusion reaction that creates electromagnetic energy” (Ambient Weather, 2019). This definition works for a scientific, technical understanding. But when analyzing events such as the ISA, solar radiation becomes much more complex and nuanced. Solar radiation becomes political as it unites the diverse countries within the torrid zone. Solar radiation becomes technical as a catalyst for renewable energy and a cleaner future. Each of these articulations of solar radiation must be considered and examined for a fuller account of our state of affairs.

While the signing and ratification of the ISA should be celebrated, there is still much work to be done. The ISA was established with ambitious goals. Not only will its financial aims be difficult to accomplish (\$1 billion USD by 2030), but so, too, will be the production and deployment of solar technology across countries within the torrid zone. Simply put, the ISA still has the potential to fail. This is a lesson that we can learn from the Kyoto Protocol. Just because a treaty is widely adopted and ratified, that is no guarantee it will fulfill its purpose. Words do not always translate into action. The fragility and fallibility of actor-networks is a critical insight of ANT as Callon observes that “translation is a process, never a completed accomplishment, and it may...fail” (p. 196). Latour notes that actants can betray one another, networks can dissolve, and black boxes can be opened and undone. A state of affairs is never fixed, but rather, constantly in flux, constantly being made and remade by the specific interactions of actants. Therefore, the formation of the ISA is only the first step. To keep this actor-network intact and effective will require actants to continually enact their goals through translation, problematization, *interessment*, enrollment, and mobilization. As Sengupta points out, “The Paris Agreement...is only as good as the willingness of national leaders to keep their word” (2018).

In the end, only time will tell if the ISA succeeds in implementing solar energy throughout the world, and with it, fulfill its hopes of mitigating carbon emissions and the threat of climate change. ANT serves as an effective framework and tool for analyzing phenomena like the ISA by revealing the hybrid nature, both the cultural and the natural in the actants that make up our global, technologically-driven world. ANT also highlights the potential for the failure of any actor-network, any victory, and insists that actants must continually mobilize to ensure the success of their goals. Finally, ANT is useful in pursuing careful descriptions, rather than ready-made explanations, for the phenomena of our world. While these descriptions may be more taxing, slow, and complex to

produce than conventional analyses are, they offer a much more complete understanding of our state of affairs—an understanding that may lead to more effective articulations of climate change and its full range of effects.

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# Chapter 5: Conclusion

## CONCLUSION

Climate change is the greatest threat facing humanity in the 21<sup>st</sup> century. Despite efforts by the global scientific community to understand and respond to this environmental threat, I argue that a strictly scientific or technical approach is insufficient. In addition to the physical effects of climate change, such as increased surface temperature, sea-level rise, and biodiversity loss, Fiskio observes that “climate change is an idea as well as an empirical reality” (p. 1). Through a scientific and technical lens, we achieve only a partial view of climate change. To complement these approaches, rhetorical analysis becomes an important tool to examine the manifestation of climate change as it emerges in sociomaterial ways.

The work of French sociologist Bruno Latour is ideal for this new approach to climate change analysis because it suggests new methods of problem solving. Using Latour’s understandings of sociomaterial phenomena, the agency of nonhumans, matters of fact and matters of concern, and by using the analytical framework provided by Actor-Network Theory (ANT), I examine some of the rhetorically critical points of climate change discourse as they manifest during three of the most significant environmental treaties of the 20<sup>th</sup> century (1987 Montreal Protocol, 1997 Kyoto Protocol, and the 2015 Paris Agreement). My research has asked: how would the contemporary story of climate change look different when we reexamine its rhetorical traces, manifested through language and discourse, in terms of sociomaterial phenomena, nonhuman agency, and matters of concern?



A misstep in much of our current climate change discourse stems from what Latour sees as the Modernist divide (1993). Since the European Enlightenment, Modernity, enacted especially through modern science, has dominated Western culture and ideology and neatly divided the world into the cultural and the natural. For Harman, Modernism “either appeals to a nature of things that exists whether we like it or not, or appeals instead to a human society that is nothing but an arbitrary projection of values onto a cold grey world of physical matter” (p. 251). Modernity insists on one or the other. One of Latour’s primary projects has been to trouble this dualism, this either/or, by following actants closely as they interact, by allowing nonhumans the potential for agency, and by understanding phenomena as hybrids that as sociomaterial in nature.

In this concluding chapter, I reflect on the implications of using such an approach to assess and analyze the rhetorical construction of our climate crisis. First, I respond to common critiques aimed at ANT and Latourian philosophy, and reassert why I find these approaches beneficial, in light of the imperfections of Latour’s project. Then, I recount Latour’s role in the 1990s “science wars” and highlight how they might have helped cultivate our current era of misinformation and scientific skepticism. I reference one of Latour’s more recent works, *Down to Earth* (2018), as his critical response, and discuss how Latour’s concept of matters of concern may be the most useful tool in tackling the rhetoric and discourse that crafts climate change. Finally, I point to the 2015 Paris Agreement as the most recent attempt at a global response to climate change and consider how a Latourian understanding of the “gathering” may offer us all both direction and hope.

## CRITIQUE OF LATOUR AND ANT

Although Latour and ANT have been taken up in various academic fields, there has also been widespread criticism. Assessing this criticism leveled against Latour, Bloor observes that “Latour’s

style is seen as lively and engaging but his recommendations are treated as unconvincing and his thinking is judged to be confused” (p. 95). Following Latour’s logic or line of argument is as complex and convoluted, and often contradictory, as ANT itself. Latour rarely lays out a distinct, clear method. He does not analyze a specific dataset and he rarely applies a full analytical study to a distinct case study. Instead, Latour works on a broader scale to trouble the entire epistemological framework of the post-Enlightenment West.

Many researchers in the field of sociology believe that Latour fundamentally misunderstands the area of study. Bloor claims that Latour’s critique of sociology is “based on a systematic misrepresentation of the position he rejects, and that his own approach, in so far as it is different, is unworkable” (p. 82). This is a common critique of Latour’s work: the practicality, the potentiality from theory to action. While Latour, via ANT, constantly asks us to slow down, to trust the actants, this can lead to difficulties in the formulation of actual analysis. How slow can we follow the actants? How do we account for them all? One primary difficulty, I believe, is the *praxis* of ANT and its potential for practical, real-world application. ANT is established on a complex, comprehensive, and admittedly difficult, approach to sociological analysis. To “follow the actors themselves” leads to a more complete and full understanding of phenomena, but it also traces out difficult and meticulous actor-networks (2005, p. 179). While this approach may lead to a more honest and complete understanding of phenomena for the researcher, it also hamstringing our ability to communicate these findings to a wider, more general audience. To put it another way, this method directly opposes neoliberal values of efficiency and productivity.

One of the most controversial beliefs of ANT is its flattened ontology, which “argues a hierarchical configuration” of the subject over the object and allows for the “decentralization of a single

‘objective’ voice” by analyzing all actants, human and nonhuman, on equal footing (Springett, p. 630). Through ANT, Latour claims that objects can be used as “what explains the contrasted landscape we started with,” not just mere complements to social phenomena (2005, p. 72). Thus, nonhumans are granted an unparalleled focus and source of agency compared to other analytical frameworks and ontologies. Nonhumans, for Latour, are not merely the results of human agency, but rather, sources of agency themselves.

As one might expect, this flattening of the human and the nonhuman has been met with resistance. Agreeing with Latour that both subjects and objects co-exist within “one continuous nature,” Elder-Vass argues that “human beings are different inhabitants than entities of other types because we are composed of certain characteristic types of parts...which gives humans a distinctive set of powers and capacities” (p. 113). It is one thing to say humans and nonhumans alike should be considered in the understanding of social phenomena, but for Elder-Vass and many others, it is an entirely different thing to claim these actants exist on equal footing. Humans, simply, can do so much more than any other category of actant.

Hornborg agrees that nonhumans and objects should be accounted for in our analyses—but they should not be granted the same status as humans who are capable of symbolic meaning-making, claiming that “we must retain our capacity to analytically distinguish between the semiotic and the biophysical aspects of socioecological processes” (p. 105). He argues that “the Anthropocene should not prompt us to abandon distinctions between society and nature but to...distinguish between sentience and non-sentience and between the symbolic and the non-symbolic” (p. 95).

Elder-Vass questions the “conflation of referent and reference” in how ANT analyzes assemblages (p. 100). He argues that Latour’s insistence that natural phenomena, such as Pasteur’s fermentation, do not exist prior to Pasteur’s discovery, contradicts the flattened ontology wherein all actants exist on equal footing. To suppose that a nonhuman cannot exist without a human, it would seem, contradicts the equality Latour calls for.

Yet, this flattening of the human and the nonhuman, I believe, is oversimplified by Latour’s critics. Latour does not believe that there is no difference between an oak tree and your mother, rather, he advocates for a style of analysis that does not assume an ontological hierarchy where the subject is intrinsically granted privilege over the object. ANT invites nonhumans to dinner but does not necessarily seat them at the head of the table. Latour observes that “ANT is not an empty claim that objects do things ‘instead’ of human actors: it simply says that no science of the social can even begin if the question of who and what participates...is not thoroughly explored” (2005, p. 72). Our world is occupied by a litany of nonhuman actants. Why leave them invisible in our research and analyses?

In using ANT, Latour advocates that:

It’s not that there is no hierarchy, no ups and down, no rifts, no deep canyons, no high spots. It is simply that if you wish to go from one site to another, then you have to pay the full cost of relation, displacement, and information. No lifts, accelerations, or shortcuts are allowed. (pp. 176-177)

Shortcuts are key here, as I believe the subject/object hierarchy (corresponding to the Modernist divide between culture/nature) is a major ontological shortcut. In our analyses, we often presuppose that subjects act more, influence more, and thus, matter more, than the objects, ideas, and institutions involved in our assemblages. This became a key insight in chapter four as I complicated the Paris Agreement narratives, extending beyond Gore, Modi, Macron, and nation-states, to reveal the influence of a wide range of actants. To see the PA, or any environmental treaty, as just an agreement between these political figures (and thus, the countries they represent) offers a myopic understanding of how phenomena actually develop. To understand the PA, one must incorporate carbon dioxide, the Industrial Revolution, solar energy, the oceans—almost an endless list of actants that influence and are influenced by this hybridized phenomenon.

## OUR NEW SCIENCE WARS

In the late 20<sup>th</sup> century, scientists and critics engaged in debates concerning the production of scientific knowledge. Spurred by Kuhn's 1962 *The Structure of Scientific Revolutions*, the rhetoric of science developed over the latter half of the 20<sup>th</sup> century as a fundamental critique of science, highlighting the role of the social in the construction of scientific facts and knowledge. Scholars including Kuhn, Feyerabend, Keller, Latour, and Law contributed to a growing field that worked to rattle and trouble the once-secure objectivity of the scientific method and scientific knowledge. Scientific realists, including Norman Levitt, Paul R. Gross, and Alan Sokal, rejected these critiques, claiming that "the postmodern project is muddleheaded and politically dangerous" in its inquisition of science (Henriques, 2012). In 1994, Gross and Levitt published *Higher Superstition: The Academic Left and Its Quarrels with Science*, which condemned the work of the rhetoricians and advocated for the realism of science work. Perhaps the most pivotal moment in the science wars came in 1996 when Sokal published an article in a leading postmodern journal. While at first blush the article seemed to

offer a “postmodern interpretation of some of the fundamental issues in physics,” Sokal later revealed it to be a hoax, demonstrating (at least for the circle of scientific realists) that “much postmodern scholarship was intellectually vacuous” (2012).

In recent years, the flames that once fueled the science wars have faded. While both camps still dispute the issues of realism and relativism in science, they seem to have become resigned to incommensurability—each side claiming the other simply does not understand its theories or approach. However, in the midst of this stalemate, I argue that a new science war has begun as digital technologies connect our world into a global audience. We live in a world that practically drowns us in information and data, and yet, politicians still adamantly deny climate change, thousands of parents refuse to vaccinate their children over unfounded fears of autism, and Flat-Earthers have recently soared in numbers. How is it possible for such misinformation to spread when we have more access to information than any civilization in the past?

Reflecting on the original science wars, Latour believes it to be a misnomer, claiming that the science wars were never so much a war, but rather “a dispute, caused by social scientists studying how science is done and being critical of this process” (de Vrieze, 2017). But for Latour, the situation is much different now: “we are indeed at war. This war is run by a mix of big corporations and some scientists who deny climate change. They have a strong interest in the issue and a large influence on the population” (2017). To fight this war, we must “regain some of the authority of science” as those who work against established science, such as climate change or vaccines, use relativism for their own devices (2017). Latour asks, using the example of 9/11 hoaxers: “What has become of critique when a book that claims that no plane ever crashed into the Pentagon can be a bestseller?” (2004, p. 228).

Many refer to this backlash against established science as symptomatic of our post-truth age. Latour, however, sees it as more fundamental than that, believing that “large groups of people are living in a different world with different realities” (de Vrieze, 2017). It isn’t just that climate deniers deny the *truth* of climate change, but rather, they exist in a reality where the climate is, indeed, not even changing. As Latour notes, “to have common facts, you need a common reality” (2017). And in a world of global, interconnected digital technologies, ones which provide a platform for almost any individual with an internet connection, there are more realities in existence than ever before. From the sea of information and data, an individual can select their reality, and no matter how far-fetched it may be, find a community of those like-minded.

Many blame Latour, and other rhetoricians of science for their role in destabilizing the objectivity of modern science. Critics claim that “by showing that scientific facts are the product of all-too-human procedures...Latour—whether he intended to or not—gave license to a pernicious anything-goes relativism that cynical conservatives were only too happy to appropriate” (Kofman, 2018). And for the most part, Latour agrees. In a 2018 *New York Times* interview, he confesses his fear that critical inquiry is “being ‘smuggled’ to the other side, as corporate-funded climate skeptics used arguments about the constructed nature of knowledge to sow doubt around the scientific consensus on climate change” (2018). For Latour, though, and many other rhetoricians of science, what justified their earlier critiques was their confidence in science and the infallibility of this objective approach to understanding the world. In the latter-half of the 20<sup>th</sup> century, the scientific worldview was so strong that it warranted critical examination. But today, in a world of misinformation and scientific skepticism, perhaps those who once critically examined science must return to defend it.

Designating blame, however, does little to address the crises of our day, particularly those at the intersection of science, politics, and the ongoing destruction of the natural environment. Instead, scholars and researchers must address our current state of affairs, recognize it for what it is, and work to reassert the confidence of science. In *Down to Earth* (2018), Latour examines our present moment, specifically the intersection of deregulation, widespread economic inequality, and climate change denial (p. 1). In Latour's reflection, he posits that "we can understand nothing about the politics of the last 50 years if we do not put the question of climate change and its denial front and center" (p. 2). Evolving from his critique of the Modernist divide, Latour again advocates for the rejoining of politics and nature, reuniting the cultural and the natural. One cannot be understood without the other.

Latour suggests we need to rediscover a common world, a common reality, to solve our climate crisis. For example, when the US pulled out of the Paris Agreement, Latour claims that Trump started "a war over what constitutes the theater of operations: 'We Americans don't belong to the same earth as you. Yours may be threatened; ours won't be!'" (p. 3). To rediscover this common world, we need a new map, a new direction—one that neither leads us *forwards* (to an endlessly progressive Modernist utopia) nor *backward* (to an idealistic, nationalistic past). Instead, we must seek out a third path, one that brings us back "down to earth" and engages Earth as "a new *political actor*" (p. 40).

This argument corresponds to Serres' call for a revised Social Contract, a Natural Contract, one that incorporates the rights of the natural world (2003). To reengage with our environment, Serres believes "we must add to the exclusively social contract a natural contract of symbiosis and reciprocity in which our relationship to things would set aside mastery and possession in favor of



admiring attention, reciprocity, contemplation, and respect” (p. 38). We must allot the Earth, and its legions of nonhuman actants, a place at the table, just as Lynch and Rivers argue for “bigger courtrooms for a judicial rhetoric in which human and nonhuman actors face ever-stranger trials of strength” (p. 17). Imagining and then composing this longer table, these larger courtrooms, is the rhetorically complex task at hand, although Serres notes how “the Earth speaks to us in terms of forces, bonds, and interactions, and that’s enough to make a contract” (p. 39).

### BACK TO MATTERS OF CONCERN

To build this longer table, I believe Latour offers us many key insights and advantages. While ANT and Latour have been heavily criticized, I believe Latourian philosophy is still useful for examining our climate crisis. While ANT, as an analytical tool, may be too convoluted, too complex, too messy, Latour’s conceptualization of matters of concern remain an effective tool in articulating scientific information to broader audiences. The transformation of scientific information, from a matter of fact to a matter of concern, crafts agencies “as gatherings” of various actants, their interests and their needs (Latour, 2005, p. 114). Latour argues that “reality is not defined by matters of fact” which offer only “a subset of what could also be called states of affairs” (2004, p. 232). As demonstrated in chapter three, offering a technical description of a phenomenon only gets you so far. To “gather” more allies, it is more effective to transform that technical fact into a social concern—one that articulates a more complete description of the phenomenon. Like how the hole in the ozone was transformed into skin cancer, geopolitics, and even “AIDS from the sky,” we must devise methods of articulation to rally diverse publics to respond to our contemporary environmental threats (Magas, 1991).

For Latour, a phenomenon can be understood as a gathering, an alliance that is always contingent, between various actants to result in the things and objects of our world. For too long, Latour notes, critical analysis has weakened scientific objects by unveiling the gathering of actants: “no matter what we do, when we try to reconnect scientific objects with their aura, their crown, their web of associations... we always appear to weaken them, not to strengthen their claim to reality” (2004, p. 237). What we must do is invert this notion, to craft a “stubbornly realist attitude” that brings us closer to our objects of examination rather than farther away from them. As I discuss in chapter four, we must turn what once was considered purely scientific, technical, natural, into concerns that gather us all as actants with something at stake. For that is what climate change truly is—a phenomenon that gathers us all and makes us, whether willingly or not, to recognize the interconnected nature of all the actants on this planet.

## LOOKING TO THE 2015 PARIS AGREEMENT AND BEYOND

In 2016, I attended *Under Western Skies*, an interdisciplinary conference that gathered a wide range of scholars including biologists, chemists, and those in the humanities. Truly, with such a diverse gathering, Latour should be proud—and he was, as he was the keynote speaker at the conference. Attending panels during the three days of the conference, one theme arose consistently and has stuck with me ever since. Scientists, no matter their field or area of study, often concluded their presentations with a similar appeal: we have the data, we understand the processes, we just need people to listen to us, to understand, to care. This appeal concluded a wide range of presentations on soil erosion, plastics pollution, sinking water tables, and of course, climate change. As a doctoral student in rhetoric and composition, I couldn’t help but feel as if these scientists were appealing directly to myself: we need your help.

In this cultural moment of misinformation, science skepticism, and individuals who truly live and communicate in distinct realities, scientists need the help of the humanities, especially those of us in rhetoric, composition, and communication fields. They need our experience, our skillsets, and our critical approach to discourse and social dynamics to translate the technical language of science to those of “concerns” to be rhetorically effective in reaching widespread and diverse publics. This is why I believe Latour’s concept of matters of concern offers, perhaps, the most useful tool for combatting climate change deniers and gathering individuals together to enact change—to save our planet.

That is the primary purpose of this dissertation. As made evident by the failure of the Kyoto Protocol and the fact that, in 2018, we as a global community emitted more carbon dioxide into the atmosphere than ever before, our old methods of problem solving fall short when attempting to tackle an issue as complex and existential as climate change. We need to not only develop new analytical tools, new alliances, and new ways of thinking, but we need to radically reimagine our relationship with the environment and the host of nonhumans we share this planet with. To fuel this reimagining, Latourian philosophy, and in hopes, this dissertation, can help us articulate a new way forward. By taking seriously the rhetorical agency of nonhuman actants, by rearticulating facts as concerns, and by using new analytical frameworks (such as ANT) to examine the actions and events of our world, we can hopefully begin work on a new “social contract” with the environment and minimize the ongoing destruction of the biological diversity around us. This dissertation proposes that we must refresh rhetorical theory and practice with the “cultivation of a stubbornly realist attitude” and examine critically the role of discourse and language in the sociomaterial construction of the events and phenomena of our world (Latour, 2004, p. 232).

The 2015 Paris Agreement is the most recent attempt to address carbon emissions on a global level. Despite Trump's withdrawal and waning support from other major emitters, such as Australia, there is still cause for optimism as countries throughout the world work to cut dependence on fossil fuels and transition to renewable energy sources. But this optimism is consistently undercut. With environmental treaties, progress is constantly negotiated. For example, while the UK and the Netherlands "have vowed to phase out the use of coal power, Poland is currently building new coal plants" (Plumer & Popovich, 2018). While China invests heavily in renewable energy, it still continues to emit more carbon than the US and the EU combined (Rapier, 2018). Clearly, the fight against climate change is a mercurial one—one of victories and setbacks, peaks and valleys. Sound familiar? This echoes Latour's description of ANT's analysis—one that moves slowly, climbs carefully, achieves gains and suffers setbacks. ANT examines phenomena as they move, as they exist, and it seeks to understand them as always contingent. No victory is ever totally secured.

While it is still too early to determine the efficacy of the Paris Agreement, it is important to support its efforts by continually engaging with this ongoing "gathering" of actants on the world stage. For that is what all major environmental treaties have been—gatherings of countries, individuals, ideas, needs, fears, commitments, and concerns. According to Heidegger, the gathering of a thing should connect the "united four, earth and sky, divinities and mortals, in the simple onefold of their self-unified fourfold" (p. 178). More simply, the gathering becomes "an issue very much in there" (Latour, 2004, p. 233). In, of course, references *in* the concerns of the actants, their needs, their motivations, their connections. To effectively respond to climate change, the greatest existential threat humanity has ever faced, we must gather on such a scale as we have never done before.

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