Changing Everything about Science and Its Rhetoric

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The symposium for which this essay was written was organized as a kind of public reading group where scholars of rhetoric from across the U.S. met to discuss Naomi Klein's 2014 book *This Changes Everything: Capitalism vs. the Climate*. As is often the case when people get together to talk about what a text means to them, the specific interests of each participant shaped their interpretation and judgment of the shared artifact. In my case, interest in the public ethos of scientists got me thinking about how Klein's book describes scientists in two ways: as the silenced victims of corporate power, or as villains hopelessly tied to an extractivist mindset. Neither characterization sits well with me. My research on the argumentation of climate scientists and my research on the conceptual metaphors that shape scientists' understanding of themselves are experiences that make me believe that scientists, if given the chance, can be indispensable allies in this moment of crisis. In short, while I found much to admire in reading Klein's book, I also came to the conclusion that in her treatment of scientists, she abandons a group of "new climate warriors" (293) who are going to be needed in the fight to move "from extraction to renewal" (419). The people she fails to speak to in this book are the rising multitude of socially-aware scientists oriented toward the public good.

Klein's thesis is that the climate crisis that we face is an opportunity to transform our failed economic system of capitalism into something radically better. That is a worthy thesis, but I think it needs to be supplemented with a recognition that this crisis is also an opportunity to change science into something radically better as well. The way we talk about science and the way we think about science can influence the way we do science, and vice versa. A more responsive and responsible science, engaged with the publics for whom it

works and entangled with the material ecology upon which it focuses, resilient rather than resistant or controlling, is a change that can be catalyzed by this crisis as well.[1] In what follows, I will make the case for this supplement to Klein's thesis by organizing my commentary around the two ways in which her book both connects and conflicts with research that I have been doing lately on the rhetoric of science and scientists, namely her treatment of scientists as ineffectual rhetors silenced by corporate machinations and her treatment of scientists as scoundrels driven by a market logic.

The most obvious point of contact that I have with this book is my research on the political argumentation tactic known as manufactured scientific controversy, or "manufactroversy" ("Manufactroversy;" "Manufactured Scientific Controversy"). This is when debate over a scientific issue has already run its course in the technical sphere (that is, in communication fora where experts adjudicate scientific claims, such as peer-reviewed scientific journals) to the point where a scientific consensus has developed, but the general public is misled into believing that a raging scientific controversy still exists on the matter; in such a situation, the scientific controversy is not real, but is being manufactured by politically-motivated agents for public consumption[2]. So, for example, Republican tactician Frank Luntz sought to delay policy action by encouraging politicians to produce a manufactroversy on climate change, amplifying the voices of those who publicly claimed that the science was unsettled, long after the scientific issues had been resolved in the relevant communities of expertise (137-38). This tactic is particularly difficult for climate scientists to counter because if they protest that no scientific controversy exists on the matter, it is easy for people following Luntz's advice to portray them as part of an orthodoxy that is illegitimately silencing dissent. But if climate scientists attempt to engage the public debate over whether or not a scientific controversy exists, they end up giving legitimacy to those who want to sow doubt about the scientific consensus. But not engaging the public debate makes climate scientists seem like an undemocratic orthodoxy trying to silence dissent by refusing to debate. And so it goes.

My research into the rhetorical dynamics surrounding manufactroversies suggests that climate scientists can break the vicious circle by narrating the history of the scientific debate over the matter, thus countering the charge that opposition is being stifled and shifting the burden of proof onto skeptics to justify re-opening a closed debate.

Scientists can also point to smoking gun documents that prove the "skeptic" knows the consensus is real and is trying to manipulate the public into thinking there is a scientific controversy when there is not. Finally, scientists can shift the public debate to questions of value and policy that are more appropriately contested in the public sphere, where citizens decide what to do with the knowledge we have ("Manufactured Scientific Controversy" 212–17). Katharine Hayhoe and Stephen Schneider are two climate scientists known for embracing their responsibility to communicate with skeptical lay publics, and they have shown considerable rhetorical skill in doing so. Scholars of rhetoric have analyzed their discourse in an effort to assist other scientists who would address climate change skeptics; they have found that the creation of common ground and efforts to build trust with opposition audiences are key to an effective response (Goodwin; Cloud).

Klein writes about a number of underhanded maneuvers that are being used to stymie scientific experts who have important information to convey to the public, although she does not identify methods to counter these tactics. The distressing stratagems she identifies are similar to manufactroversy in that they are difficult to counter, and so they can potentially lead to scientists' cynical withdrawal from the public sphere. One such tactic is intimidation of experts. As Klein points out, the goal of climate change deniers "was never just to spread doubt but also to spread fear—to send a clear message that saying anything at all about climate change was a surefire way to find your inbox and comment threads jammed with a toxic strain of vitriol" (34). The result is that "some climate scientists report receiving the kind of harassment that used to be reserved for doctors who perform abortions" (Klein 37–38). Another example of the sleazy tactics deployed against scientific experts is the "reputational smear" used on a doctor who raised concerns about the health effects of tar sands operations. This smear campaign against one physician made other doctors more reluctant to speak out on the issue for fear of having their own reputations attacked (Klein 327). Klein also points to a number of U.S. and Canadian politicians who have waged a "war on science" for financial and ideological gain. Such politicians cut funding to areas of research that threaten business as usual in the oil industry, and create exemptions from federal monitoring of industry sites. As Klein explains, "Only by systematically failing to conduct basic research, and silencing experts who are properly tasked to in-

vestigate health and environmental concerns, can industry and government continue to make absurdly upbeat claims about how all is under control in the oil patch" (327–28). Matters have gotten even worse since Klein wrote her book, since these tactics are being deployed now with renewed vigor by the Trump administration (see, for example, Mufson; Waldman; Davenport).

After reading Klein's book, one might conclude with despair that scientists have been effectively muzzled by these tactics. But they have not. That scientists are more eager than ever to claim their public voice is evident in the performance of the multitudes who in 2017 took to the streets in the "March for Science" that took place in Washington DC and hundreds of cities across the country and around the world (St. Fleur). Never before has there been such a well-attended, organized action in support of science. When career scientists, who experience considerable pressure to leave politics to others, begin marching in the streets, one might conclude that indeed, everything has changed.

In an article that Klein wrote for the *New Statesman* in 2013, she celebrates scientist-activists who join such protest marches. She praises James Hansen, "the godfather of modern climate science" who has been arrested multiple times for his campaign of resistance against industry intransigence, and Jason Box, a glaciologist who got arrested for protesting the Keystone XL tar sands pipeline (36). As Box put it at the time of his arrest, "I couldn't maintain my self-respect if I didn't go . . . just voting doesn't seem to be enough in this case. I need to be a citizen also" (quoted in "Science Says: Revolt!" 36). When Klein calls such experts the "new scientific revolutionaries" in her *New Statesman* article (36), she is not invoking the Kuhnian meaning of scientific revolution, but returning the term to its original political sense; these scientists are doing normal science that inspires them to take revolutionary political action in the public sphere[3].

I love that article because it is refreshing to see scientists being encouraged to embrace their role as citizens. Too often, scientists are discouraged from thinking about themselves as members of a larger public. They are told to act as "honest brokers" only, to list the facts dispassionately, and punctiliously decline to express an opinion on which public policy is best supported by the data (Pielke Jr.). But in her *New Statesman* article, Klein argues that the development of such professional norms is yet another tactic to gag scientists and lull the general public into thinking that everything is fine, when it is not. By

reminding us that scientists do not give up their citizenship responsibilities when they receive their degrees, and portraying them in her *New Statesman* article as heroic figures leading the battle against the captains of industry who are destabilizing life on earth, Klein seems to be imagining a new role for scientists as rhetors, as people who are trained in both science and the political skill needed to lead publics to good decisions. It is an image that I wish she had also developed in her book.

The figure of the activist scientist-citizen that is missing from Klein's book is one that I have been thinking about a great deal lately. This figure is not to be confused with the citizen-scientist, that public activist who gains enough subject-area expertise to contribute to the science in a given area of concern. There has been much written lately about the citizen-scientist, as well there should be; the citizen-scientist is a figure of great importance to our era[4]. But so, too, is the scientist-citizen. The scientist-citizen is the expert who resists being shunted to the technical sphere only, who enters the public sphere willingly and embraces her duty to share her findings with her fellow citizens, despite the dirty political tactics of those who would try to silence her inconvenient truths.

I was surprised and disappointed to find so little of the scientific revolutionaries that Klein had introduced in her *New Statesman* article in her book on climate activism. Instead, the scientists she describes in the book are, for the most part, either good researchers who are effectively silenced by the devious tactics of the carbon extraction industries, or "mad scientists" (451) taking advantage of the climate crisis by swooping in with frightening solutions like geoengineering that play off of the "magical thinking" (189) of a public desperate for "climate solutions that adhere to market logic" (279).

This latter image of scientists as opportunists portrays them as complicit with the frontier mindset that underlies extractivism, and evokes the second line of research that I have done that intersects with Klein's book. In my most recent book, *On the Frontier of Science: An American Rhetoric of Exploration and Exploitation*, I examine the way some U.S. scientists using the metaphor of the research frontier draw on a mythic understanding of the American spirit, celebrating rugged individualism, risk-taking, and competition to justify their work; in so doing, they deflect other, more productive and sustainable attitudes toward science. For example, biologist E. O. Wilson uses the frontier metaphor extensively in his books promoting biodiversity research.

Even though he admits that the concept of wilderness as a frontier region waiting to be rolled back is a deadly mindset that is facilitating the next great extinction spasm on this planet (Wilson, *The Future of Life* 144), he cannot help but use the frontier concept himself to try to get scientists excited about biodiversity research. He even calls such research "bioprospecting" and promises wealth to those scientists who extract hidden gems in the as yet undiscovered species of plants and animals with potentially useful pharmacological properties that can be found in the Amazon rainforest (Wilson, *The Future of Life* 124; *The Diversity of Life* 3-8, 331). He is caught in the capitalist mindset, so the only way he can place value on biodiversity is to compare it to riches waiting to be discovered by colonialist scientists, even at the same time that he recognizes this mindset as the very thing that is destroying the biodiversity he wants to preserve[5].

Klein ties this frontier mindset to science when she discusses Francis Bacon, "patron saint" of both science and the "modern-day extractive economy" (170). As she explains, "Extractivism ran rampant under colonialism because relating to the world as a frontier of conquest—rather than as home—fosters this particular brand of irresponsibility. The colonial mind nurtures the belief that there is always somewhere else to go to and exploit once the current site of extraction has been exhausted" (170). She argues that science adopts this mindset when it abandons "pagan notions of the earth as a life-giving mother figure to whom we owe respect and reverence (and more than a little fear)" and ties us to "ideas of a completely knowable and controllable earth" over which we have dominion (170).

The question of what metaphors we should use to talk about the earth and science is taken up explicitly by Klein when she critiques science studies scholar Bruno Latour's charge to scientists to "love your monsters." Latour argues that the real lesson of Mary Shelley's Frankenstein was not that scientists sin against Creation by making their own new creatures, but that they sin when they abandon their creatures rather than love and care for them as children ("Love your Monsters"). Klein sees Latour's reference to Frankenstein's monster as a "metaphor for geoengineering" as a solution to the climate crisis, and a terribly poor metaphor at that (279). As she explains, "'the monster' we are being asked to love is not some mutant creature of the laboratory but the earth itself. We did not create it," she says, "it created—and sustains—us. The earth is not our prisoner, our patient, our machine, or, indeed, our monster. It is our entire world. And the

solution to global warming is not to fix the world, it is to fix ourselves" (279). Later, she continues with her metaphor analysis by critiquing the image of the earth as a big blue marble that we can hold in our hands as we take on the persona of "the parent of the earth" resolved to save the planet. "But the opposite is the case," she says. "It is we humans who are fragile and vulnerable and the earth that is hearty and powerful, and holds us in its hands . . . an earth that, if pushed too far, has ample power to rock, burn, and shake us off completely. That knowledge should inform all we do—especially the decision about whether to gamble on geoengineering" (285). It is a gamble that Klein rightly opposes.

As a rhetorician, I appreciate the critical analysis of metaphors. I think Klein is correct to remind us that the climate crisis is a danger to our vulnerable ecosystems and societies, not to the earth itself; when all is said and done, the planet will continue along just fine without us. But where I think she might be wrong is in her interpretation of Latour's metaphor. Latour was not comparing the earth to a monster child. The tenor (or principal subject) that he was modifying with the metaphoric vehicle (or figure) of Frankenstein's monster was the technology that we create on that earth.[6] Our technologies are the monstrous children over whom we have a responsibility. As Latour puts it, "It is not the case that we have failed to care for Creation, but that we have failed to care for our technological creations" ("Love your Monsters"). Like Dr. Frankenstein, who turned away in disgust from the monster he created, rather than take on his responsibility to care for it, we are responsible for the criminal acts of our technological creations, creations such as the combustion engine, when we fail to tend to them and nurture them into becoming more virtuous agents.

I am also pretty sure that Latour was not offering this corrective on the moral of the Frankenstein story as a metaphor to promote geoengineering. Latour does not have very good things to say about geoengineers in another recent article, where he denounces their "schemes to save the planet," each of which, he says, are "crazier than the next" ("Agency at the Time of the Anthropocene" 8).

In fact, I think that Latour and Klein are in agreement about how we humans need to rethink our role in the world. Both argue that we have to abandon the modernist capitalist mindset that develops technologies like the combustion engine that are designed to free us from nature. Instead, we need to adopt a mindset that, as Klein puts it,

places us "in relationship with the rest of the natural world," working with renewables like solar and wind to do that (395). Latour describes the new mindset as a compositionist one: "What the [old] emancipation narrative points to as proof of increasing human mastery *over* and freedom *from* Nature—agriculture, fossil energy, technology—can be redescribed as the increasing *attachments* between things and people at an ever-expanding scale. If the older narratives imagined humans either fell from Nature or freed themselves from it, the compositionist narrative describes our ever-increasing degree of *intimacy* with the new natures we are constantly creating" ("Love Your Monsters"). Klein uses another metaphor that helps explain this new mentality: "if extractive energy sources are NFL football players, bashing away at the earth, then renewables are surfers, riding the swells as they come, but doing some pretty fancy tricks along the way" (394). The science that produces renewable energy technology is a science that adopts an ethos of relation, flexibility, and ongoing creative adaptation; it is what Latour identifies as a compositionist rather than a modernist science ("Compositionist Manifesto").

The main difference that I see between Klein and Latour is that Klein thinks that we need to "unlearn the myth that we are the masters of nature—the 'God Species'" (395), while Latour would locate our responsibility in that very parallel between ourselves and God. For Latour, our sin is not hubris; our sin is our belief that dominion over Nature "means emancipation and not attachment" ("Love Your Monsters"). Klein adopts a pagan or romantic notion of Mother Nature holding us in her nurturing or angry hands; Latour adopts a "postnatural" notion of humans, nature, and technology as hopelessly intertwined ("Compositionist Manifesto" 480).

This difference between Klein and Latour is one that makes a difference, in the end. I think it might help to explain why the scientists in Klein's book are given so little role to play in the new start that she hopes will bring us out of the extractivist-driven climate crisis. For Klein, it is a young Cheyenne man selling solar air heaters in his local community who acts as a model of ethical behavior for working synergistically with the earth instead of just using it (395), but not the scientists creating such technologies or advocating for their funding by Congress. Because when it comes right down to it, science is suspect for Klein; it is hopelessly hubristic. In contrast, for Latour, scientists must learn "to compose with, that is to compromise, to care, to move slowly, with caution and precaution" while

abandoning the twin temptations to "abandon all innovations" or to "innovate as before without any precaution" ("Compositionist Manifesto" 487). Latour's call for scientists to imagine "innovating as never before but with precaution!"("Compositionist Manifesto" 487) is not an endorsement of risky solutions like geoengineering. But neither is it an abandonment of science as irreversibly tied to a dangerous extractivist mindset. Instead, it is a vision of a better science, a more attuned science, a less simplistic, more complex, human-scaled science that privileges adaptability, ecological balance, and the care of our creations.

I would like to think that this is a vision of science that can be realized by the best of our era's scientist-citizens, some of whom are the young people that academics like myself teach in our universities, scientists who want to make a difference and are eager to break away from old ways of thinking and talking and doing. These scientist-citizens are new scientific revolutionaries in both senses of that term, leading a revolution in the public sphere and in science as well. I wish Klein had included, in *This Changes Everything*, a glimpse of this new vision of what science can be. I wish she had devoted some space in her book to praising scientist-citizens who brave the dishonest tactics of powerful corporate and political forces and stand up for science in the public sphere, as she did in her *New Statesman* article, and I also wish she had devoted some space to celebrating scientists who create new technologies that help us surf the waves rather than try to block and tackle them.

Scholars of rhetoric can help scientists conceptualize and embrace this new ethos of care toward the technologies they create; we can help scientists as they develop a new set of professional norms that can replace the values of the modernist extractivist science that has done so much harm[7]. Klein does little to build such a vision in her book because to her, science is the enemy. The heroes of *This Changes Everything* are indigenous peoples who recognize that they are in relationship with the rest of the natural world or feminists such as Carolyn Merchant who conceptualize a "partnership ethic" (395) with nature. I agree that indigenous activists and feminist theorists are worthy of praise and emulation, but if scientist-citizens are to be inspired, they also must be explicitly connected to the values needed in our time, rather than told that, as scientists, they are necessarily in opposition to those values. We should appeal to scientist-citizens to develop the better angels of their nature, to compose a version of

inquiry that is not reductionist and destructive but complex and synergistic, working with nature rather than destroying it, maintaining the best of the professional norms of science, but jettisoning the mentality that keeps science separate from the general public and that all too often turns its ends toward competition, secrecy, and extractive profit rather than open society collaboration for the public good.

At one point in her book, Klein accidentally reveals a rhetorical strategy that I think might be useful in such a campaign to rehabilitate science. It is in a section of the book where Klein acts as a rhetorical critic, analyzing the failure of President Jimmy Carter's 1979 "malaise speech." She contrasts that speech with an Office of Price Administration pamphlet in 1942 that did a much better job of marshaling the available means of persuasion to get an American public to live within their means. As Klein explains, Carter's speech was initially well received, but then it was quickly reframed in the public eye as an embarrassing attack on American consumerism that sought to diminish American greatness. The 1942 pamphlet, on the other hand, "argued that rationing was part of the American tradition," thus grounding its appeal in a vision of American greatness (Klein 116). The pamphlet used the rhetorical figure of litotes to point out that sacrifice for the greater good "is not 'un-American.' The earliest settlers of this country, facing scarcities of food and clothing, pooled their precious supplies and apportioned them out to everyone on an equal basis. It was an American idea then, and it is an American idea now, to share and share alike—to sacrifice, if necessary, but sacrifice together, when the country's welfare demands it" (Office of Price Administration 3). With this argument, the pamphlet cleverly described limited resource use as an essential American character trait.

Klein argues that the 1942 pamphlet succeeded where the Carter speech failed because it was clear in the pamphlet that sacrifices would be distributed in an equitable fashion. But I find that explanation for the different effects of these two artifacts unsatisfying. After all, Carter's speech did not neglect the appeal to fairness; Carter said in the speech that he supported a "windfall profits tax," and personally promised to "increase aid to needy Americans" and "enforce fairness in our struggle." But if Carter's mistake was not just a failure to emphasize fairness, what did Carter's speech lack that the 1942 text had? One explanation is found in the mythic narrative included in the passage that Klein quotes from the pamphlet: by describing the "earliest settlers of this country" as frugal communalists, the 1942

text tied sacrifice to the American frontier myth, while Carter's speech did not[8].

The pamphlet's valorization of early American settlers for their spirit of shared sacrifice (rather than for their individualistic competitive spirit and extractivist ideology) reminds us that the frontier was a diverse place with more than one mindset. We would do well to remember those aspects of the frontier myth that we would like Americans today to emulate, such as the cooperative ethic of those in the wagon train, their commitment to hard work, protection of the weak, persistence in the face of seemingly insurmountable challenges, and ingenuity. These are some of the same values that Klein sees in indigenous peoples, and along with a healthy respect for homeostasis, they are the character traits needed by those who face the climate crisis we have brought upon the world. They are values needed especially by the scientist-citizens who commit themselves to the difficult work of identifying the problems we face, communicating their findings with those of us who do not share their scientific expertise, and working together to remake our extractivist technologies into regenerative systems that abide by the ethic to "do no harm."

Klein would counter that my argument that we should look to scientists to help get us out of this fix is nothing more than "magical thinking." As she puts it, we cannot place our hope in an escape narrative with "Bill Gates and his gang of super-geniuses at Intellectual Ventures" sweeping in to save us at the last minute in a Hollywood ending. We cannot delude ourselves with the lie that we are "the super-species, the chosen ones, the God Species …[and] triumphing is what we do" (289). And she is right to puncture naïve hopes for easy solutions, especially those that involve risky schemes such as geoengineering. But Klein, too, offers an escape narrative in the last section of her book. The only difference is that, in her story, it is not the scientists who will save us, but aboriginal and local communities of activists working together through the social movement she calls "Blockadia," to defeat the technology-dependent avaricious villains threatening our world. This, too, is a familiar Hollywood ending.

It is not wrong to want such an ending. We need to tell ourselves such stories to muster the motivation to stand against the powerful forces arrayed against change. We need to believe that if we work together, we can change everything. I would just like to suggest that the "we" that works together to face this crisis should include both lay and expert communities, and that the climate warriors worthy of em-

ulation are not only Henry Red Cloud's students installing solar panels in Indian Country (395-96), but also the engineering students working to build more efficient solar panels and the scientists braving the hostility of our civic spaces to warn us about just how much more needs to be done. The climate crisis that will change everything about our economic system will also change everything about science and its relationship to the publics who surround it and the technologies it creates, and this too is worthy of our attention.

Notes

[1] The language of this sentence is drawn from the rhetoric of aquaculture described by Nathan Stormer and Bridie McCreavy (19).

[2] The usefulness of distinguishing between the technical sphere and the public sphere has long been assumed in argumentation studies (see Goodnight)

[3] The meaning more frequently invoked when discussing science is from Thomas S. Kuhn's *The Structure of Scientific Revolutions*.

[4] See, for example, Wynn.

[5] For more on this mindset in Wilson's rhetoric, see Ceccarelli, *On the Frontier*, 71-90. Ironically, Klein adopts a similar mindset when she praises "Indigenous groups in the Amazon [who] have been steadfastly holding back the oil interests … [by] protecting both the carbon beneath the ground and the carbon-capturing trees and soil above these oil and gas deposits" (376). By talking about carbon as a precious "resource," and praising this group and others who take legal action against oil companies that are "stealing" their wealth, she is complicit in using language that conflates nature with capital (376-77). To counter this way of thinking, I prefer another metaphor that she uses when talking about the tar sands, when she writes that "many of the planet's largest and most dangerous unexploded carbon bombs lie beneath lands and waters to which Indigenous peoples have legitimate claims" (375). The idea of buried oil as land mines that must be avoided lest we be killed, rather than as deposits of wealth, is a powerful new way of thinking that subverts the capitalist's extractivist mindset.

[6] For more on the tenor/vehicle model for talking about metaphors, see Richards 96– 97.

[7] A recent book describing rhetoricians as just the kind of symbolic-material workers who are prepared to help scientists rethink old ways was written by Ehren Helmut Pflugfelder.

[8] Carter does make an analogy between the sacrifice of Americans during World War II and "the energy war" that he would have his audience mobilize to fight, and he asserts that every act of energy conservation "is an act of patriotism," but he offers no compelling narrative connecting shared energy sacrifice with fundamental mythic American character traits that construct an essential American identity.

[9] The success of the Na'vi of *Avatar* and the Ewoks of *Return of the Jedi* immediately come to mind.

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