



Carbon Vitalism

Life and the Body in Climate Denial

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Abstract This article names and examines carbon vitalism, a strain of climate denial centered on the moral recuperation of carbon dioxide—and thus fossil fuels. Drawing on interconnections between CO₂, plant life, and human breath, carbon vitalists argue that carbon dioxide is not pollution but the stuff of life itself and thus possesses ethical and ecological standing. This philosophy contains a poetics of denial that is too often overlooked by studies of climate skepticism focusing narrowly on industry funding. Accordingly, this article develops a reparative theory of climate denial, asking what values and relations are gathered together within carbon vitalist speech and how speakers work to sustain these connections. Through close readings of carbon vitalist media and interviews with key figures in its network, the article demonstrates how the body is central to carbon vitalism’s rhetorical and emotional framing of ecological interdependence and epistemological populism. As such, carbon vitalism in effect reenacts long-established feminist appeals to the body (though to decidedly different political purposes). The article concludes by evaluating how the climate movement could both challenge and remobilize these logics, exploring what this corporeal turn in climate denial means for feminist and antiracist theories of environmental justice and the body.

Keywords climate denialism, the body, reparative reading, epistemological populism, feminist STS

“We Call It Life”

On May 18–28, 2006, the conservative think tank Competitive Enterprise Institute aired a sixty-second climate denialist commercial titled *Energy* in fourteen US cities.¹ Coinciding with the release of Al Gore’s *An Inconvenient Truth*, the commercial was one of many volleys in a larger mediated struggle to undermine the legitimacy of climate change science and policy—one that significantly embroiled US cultural politics in the effort. However, unlike the more familiar tropes of the genre, the TV spot does not

1. Competitive Enterprise Institute, “Energy.”

direct its viewers' attention to contested facts, suspect political actors, or even the concept of global warming in any immediate way. Instead, it asks viewers to reflect on the status and meaning of a particular molecule.

At first, this molecule is presented as a mysterious link between seemingly unrelated images: sunbathers, a jogger, antelope, forests, and a young white girl blowing on dandelion seeds. The narrator explains, "There's something in these pictures you can't see. It's essential to life. We breath it out. Plants breath it in. It comes from animal life, the oceans, the earth, and the fuels we find in it." The music transitions to long pastoral chords as the invisible connection is named: "It's called carbon dioxide—CO₂."

Next, the commercial links these bodies and places to racialized and gendered images of petromodernity. Sunset silhouettes of oil rigs contrast with the body of a black woman pounding cassava and a mechanized tractor plowing a field. "The fuels that produce CO₂ have freed us from a world of back-breaking labor," it explains, "lighting up our lives, allowing us to create and move the things we need—the people we love." On screen, the glow of Times Square's lights gives way to the sparks of a welder at work, a speeding train, and two white children dressed in soccer uniforms fastening their seatbelts in their mother's minivan.

Yet these modern achievements are seemingly insecure. In its third act, the video goes dark and its soundtrack jumps to a low, sinister sounding synth as the narrator announces, "Now some politicians want to label carbon dioxide a pollutant." The symbols of the carbon-rich good life—the train, Times Square, the soccer mom, and the tractor—appear in a grid along a black background. "Imagine if they succeed—what would our lives be like then?" As an answer, the images freeze and fade to dark. "Carbon dioxide: they call it pollution."

Abruptly, the music stops and we are returned in full to the girl with the dandelion. "We," the narrator challenges, "call it life."

This commercial's approach to carbon represents a particular and underexplored strain of contemporary climate denialism. Unlike other forms of skepticism, doubt is not the primary product on offer—ethical certainty and a newly assured world order are. Its scientific reasoning is limited, but its implications for carbon politics are far more complex. The study of this worldview and its communicative schema bring us into the cultural politics not only of energy and climate change but also of gendered and racial bodies and all that they imply about environmental knowledge, politics, and emotion in a warming world.

For its strong turn to corporeal frames of understanding and the connections between the carbon cycle and the moral good of life as such, I call this approach *carbon vitalism*. In doing so, I seek to emphasize partial philosophical and affective continuities between this strain of denialism and wider new materialist theories. Vitalism is a frequently reimagined concept in the history of philosophy and critical theory that insists that living beings cannot be explained through reductive, mechanistic theories of

matter, but must instead be understood through their processual relations.² Carbon vitalism draws on similar vocabularies in its orientation against empiricist reductions of the carbon cycle and toward a selective celebration of ecological interconnections, though to decidedly different political ends. In situating these traditions (perhaps uncomfortably) close to one another, I explore how progressive analytic moves can be appropriated by opposing voices as well as how these strategies might be reexamined within a renewed climate politics.

In doing so, this discussion focuses on the interpretive allure of denialist theories of materiality rather than structural influences alone. While previous studies have focused on ideological and financial networks that promote climate denial,³ political economy alone is insufficient to explain the ways in which this message resonates to some. Just as cultural studies scholars have argued against the total reduction of cultural texts to their structural factors,⁴ molecules have an evident surplus of meanings. Of course, these are neither limitless nor equally scientifically valid. However, I argue that there are consequences to ignoring carbon vitalism on these grounds. An incuriosity toward the means by which denialist speech resonates will fail to produce the knowledge necessary for understanding and contesting the affective politics of carbon vitalism and its growing organization of popular support and political capital.

This article charts the historical emergence and key features of carbon vitalism. It focuses not on how existing market and publicity structures are adapted to climate (in)action,⁵ but how novel claims and contrarian structures of feeling are created around greenhouse gases themselves. In doing so, it builds on a growing body of scholarship that asks how material specificity shapes but does not wholly determine the character of political discourse.⁶ It demonstrates how carbon in particular, as a ubiquitous and largely insensible chemical element, must be relationally fixed to particular bodies, narratives, and political formations before it can become a meaningful object of social or material action. The study of carbon vitalism suggests that such endeavors require novel communicative work as well as social attachments at unconventional scales of analysis. It is for this reason that it is especially valuable to approach carbon vitalism through its poetics of denial, asking how it succeeds in rendering abstract molecules newly ethical.

I argue that an interpretive emphasis on the white body is key to this end. In grounding assessments of CO₂ in corporeal terms, carbon vitalists have been able to elevate heterodox forms of knowledge production that foster a new kind of carbon story. Epistemological populism and narratives of interspecies care are two distinct gains

2. For more on the genealogies of vitalism see Greenhough, "Vitalist Geographies"; Fraser, Kember, and Lury, "Inventive Life"; Bennett, *Vibrant Matter*.

3. See Oreskes and Conway, *Merchants of Doubt*; Farrell, "Corporate Funding."

4. Hall, "Encoding, Decoding," 98.

5. Boykoff, Curtis, and Goodman, "Cultural Politics"; Goodman and Boyd, "Social Life."

6. Liboiron, "Redefining Pollution"; Mitchell, *Carbon Democracy*.

from this strategy, grounding predominantly white denialist audiences in self-assured observational and affective ways of understanding their embodied connections to the climate system. However, as with all matters of bodily representation and experience, much is decided by the kinds of bodies that are universalized and those that are excluded. The study of denialist appeals to the body therefore requires careful consideration of the gendered and racial claims built into its poetics.

The “Carbon Anti-Defamation League”

Carbon vitalism coalesced as an interpretive community in response to the 2006–7 *Massachusetts v. EPA* Supreme Court case that debated the legal merits of classifying carbon dioxide as an air pollutant agent and thus potentially subjecting it to EPA regulation without an explicit congressional mandate. That effort began in 1998 as something of an activist gesture on the part of a coalition of environmental NGOs. Facing a lack of meaningful climate regulations from the Clinton administration, they sought to exploit existing language in the Clean Air Act to compel federal action. The plaintiffs therefore had to construct a chain of causality between disparate points of the carbon cycle, arguing that although carbon dioxide did not, in itself, constitute a direct threat to public welfare, there was nevertheless a perceptible and significant connection between tail-pipe emissions, asthma rates, bird migrations, agricultural production, and rising CO₂ concentrations in the atmosphere.⁷

However, as the case wound its way through the courts and as the subsequent Bush administration made environmental victories on other fronts increasingly unlikely, the character of the argument narrowed. A group of states led by Massachusetts took control of the litigation effort and presented their case exclusively through concerns about rising sea levels and territorial loss. This was a strategy that sacrificed a framing around negative multispecies health outcomes in hopes of appealing to conservative swing votes on the Supreme Court.⁸ In doing so, the body was left behind.

When the case was won in a 5-4 decision, it established a new relation between carbon dioxide, language, and law that remains the most substantive federal basis of climate action to date. In the context of the Bush administration, the victory was popularly regarded as the first federal and legal recognition of the validity of climate science more generally.⁹ It later proved essential to the Obama administration’s climate policy, conducted as it was almost entirely through the EPA and executive orders. In 2009 the EPA authored a formal endangerment finding based on the court proceedings, formally characterizing carbon dioxide as an air pollutant agent requiring federal regulatory controls.¹⁰

7. Andrew Kimbrell (key figure in the legal petition that would evolve into the *Mass. v. EPA* case), interview by author, February 8, 2018.

8. Greenhouse, “Justices Say EPA Has Power to Act.”

9. James R. Milkey (counsel of record in the *Mass. v. EPA* case), interview by author, February 20, 2018.

10. These were later established in rising efficiency standards for vehicles in 2010 and stationary sources in 2014.

Unsurprisingly, this linguistic exploit proved to be an enduring sore spot for the political right. Since 2007 there has been a growing amount of political rhetoric and cultural production that expressly refuses the conflation of carbon dioxide and pollution. This point is often made through now familiar strategies to cultivate scientific doubt and unnecessarily delay regulatory action.¹¹ However, this was not the only strategy employed and not all denialism is alike. Carbon vitalists do not just attempt to overturn carbon's linguistic fix as a pollutant, they also insist on arguing the converse: that it is the stuff of life itself. This is a message not of prudent caution but of moral certainty and natural order.

Carbon vitalism has been institutionalized within a network of conservative policy, science, and communications groups, composed almost entirely of white men. In the United States these include several major centers of libertarian thinking including the George C. Marshall, Heartland, and Cato Institutes. Several groups specifically devoted to the rebranding of carbon dioxide were also established or strengthened after 2007. The Center for the Study of Carbon Dioxide and Global Change, which focuses on the agricultural benefits of greater levels of atmospheric CO₂, was created in 2006 by the father-son team of Sherwood and Craig Idso. In 2008 H. Leighton Steward, a retired fossil fuel executive, incorporated Plants Need CO₂ and its twin group CO₂ Is Green as educational nonprofits. In 2015 William Happer's CO₂ Coalition, which he jokingly refers to as the "Carbon Anti-Defamation League," was created as a spinoff of his work with the George C. Marshall Institute, taking "carbon dioxide is essential for life" as its motto. These efforts have also spread across the (at least Anglophone) world through groups such as I Love CO₂ (Canada), the Carbon Sense Coalition (Australia), and the Global Warming Policy Foundation (Great Britain). These groups cohere into a relatively cooperative media network, citing one another's research and cross-publishing one another's views in blogs and white papers. This mutualistic promotion circulates the names and expertise of key figures, granting legitimacy within the community and cultivating a wider audience.¹²

Together these organizations and their spokesmen argue a relatively consistent position, which, while oriented toward specific policy goals, also contains distinct philosophies of nature and knowledge. This consists of the following key arguments and assertions:

- (1) Carbon dioxide is only toxic to plant and animal life at artificially high concentrations that can never be reached in the atmosphere. Accordingly, carbon dioxide cannot be a pollutant.
- (2) Higher concentrations of carbon dioxide are only very minimally linked to the greenhouse effect; CO₂'s presence in the atmosphere does not

11. Dunlap and McCright, "Climate Change Denial"; Oreskes and Conway, *Merchants of Doubt*.

12. Farrell, "Network Structure and Influence"; Boykoff and Farrell, "Climate Change Countermovement."

significantly drive global warming, but rather lags behind larger, nonanthropogenic variability in global climate. The majority of the world's scientists are mistaken in this matter because they rely on computer simulations rather than direct, immediately verifiable observations.

- (3) Higher concentrations of carbon dioxide in the air are beneficial to plants. Because carbon dioxide is a fundamental component of photosynthesis, and because a trade-off in the absorption of CO₂ through plant stomata results in some evaporation of plants' internal water supplies, more CO₂ means more plant growth with less water loss.
- (4) Atmospheric carbon dioxide has been present in much greater quantities in past periods of geologic history without causing negative effects to life on the planet. Compared to concentrations in the Paleogene period, pre-industrial Holocene concentrations were at a record, even dangerous, low. We are still presently "living fundamentally in a CO₂ famine" today.¹³
- (5) A return to these geological highs via the global combustion of fossil fuels will produce a net benefit for all people and organisms, given the resulting increases in food productivity and the modest (>1°C) expected rise in global average temperatures associated with this CO₂ "enrichment." Higher agricultural efficiency will further allow for greater conservation of wilderness and biodiversity, benefiting many species.
- (6) In both our capacities as consumers of fossil fuels and as bodies that exhale carbon dioxide, humans are acting in the service of biological life. By restoring CO₂ levels to prehistoric highs our species is fulfilling its role as a balancing force within the global carbon cycle.
- (7) Concordantly, taking steps to decrease or otherwise restrict atmospheric CO₂ emissions is akin to imperiling the growth and proliferation of life in all its forms on the planet.

Paranoid and Reparative Readings of Carbon

To climate change scholars and activists these statements read as a mixture of falsehoods, misdirections, and myopias,¹⁴ begging explanation. To this end, both scholars and activists frequently turn to structural critiques that emphasize the influence of industry funding on denialist research and communications. Such critiques follow a recognizable pattern: a playbook of skeptic tactics is documented, skewed data and networks of hidden financing are revealed, and the integrity of denialist institutes, experts,

13. George Marshall Institute, *Myth of Carbon Pollution*.

14. Svoboda, "Uprooting the Carbon Dioxide Is Plant Food Argument."

and seeming grassroots organizations are called into question.¹⁵ Behind every outrageous statement, it is implied, lies an economic and ideological incentive to bend discourse away from the facts. The task of the scholar or activist might therefore seem rather simple: expose and route the links between speech and finance.

Such analyses are typically predicated on what Eve Kosofsky Sedgwick describes as the strategies of paranoid reading, identifiable by their strong faith in making visible the otherwise hidden influences, meanings, and injustices that lie beneath cultural texts.¹⁶ Mimicking and thus seeking to possess some of the reach and powers of the object it addresses, such a project of critique is a seemingly endless effort of discovery and exposure.¹⁷ This approach has merit; paranoid inquiries have successfully exposed millions of dollars of climate denial funding which has in turn undermined the credibility of recipients and funders alike. In part because of these efforts, ExxonMobil was pressured to stop many such contributions and, in 2015, became the subject of multiple US state attorney general investigations. At least one think tank has retreated from climate issues due to the unwillingness of its donors to be associated with denialist outreach.¹⁸ These gains should be celebrated and expanded.

However, paranoid readings alone are insufficient. Given the long list of identified financial conflicts of interest that characterized the Trump administration, the power of exposure should be questioned. Narratives of industry capture, personal gain, or ideological devotion to the marketplace are not likely to persuade partisan political bases or articulate alternative moral stories that could mobilize carbon differently.

Accordingly, along with the work of exposure, there is a parallel need to read carbon vitalism reparatively. Such an approach strives to take denialist speech seriously, not for its facticity but for its concerns—its additive assembly of thoughts, desires, and its configuration of attentional and material forms of care, selective though they may be.¹⁹ Reparative studies of denial would locate the work of analysis not only in the correction of false claims about climate but also in the ways in which such claims are made intelligible and affecting regardless of their scientific merits. It requires different methodological and analytic orientations, talking to and reading with one's political opponents with curiosity and, perhaps, even empathy.²⁰ Accordingly, this article

15. Much of this activist work is archived at sites such as desmogblog.com, exxonsecrets.org, climatefiles.com, and exposedbycmd.org. For scholarly discussions see Oreskes and Conway, *Merchants of Doubt*; Farrell, "Corporate Funding and Ideological Polarization."

16. Sedgwick, "Paranoid Reading."

17. Sedgwick, "Paranoid Reading," 10, 17.

18. Vaidyanathan, "Think Tank That Cast Doubt."

19. Sedgwick, "Paranoid Reading," 24. For further theorization on the tensions between concern and critique see Latour, "Why Has Critique Run Out of Steam?," 225; Puig de la Bellacasa, *Matters of Care*.

20. For more on the methodological importance of critical empathy in climate denial, see Veldman, *Gospel of Climate Skepticism*, 16.

develops its argument through both close readings of denialist media and open-ended interviews with key figures in this denialist network.²¹

Corporealizing Carbon Claims

Reparative analysis begins with an inventory of the objects and affects through which worldmaking projects are sustained—in this case, the relations through which carbon is fixed in the work of communication. The body, to this end, is key. Carbon vitalism both relies on the role of embodied sensation in constructing knowledge claims and seeks broadly to connote personal health and ecological vitality in its public messages. In contrast to the global scale of climate models and their seemingly inscrutable construction of code, data, and future disasters, this approach proposes to accessibly re-localize and re-sensorialize knowledge about climate in bodies and in individuals. This in turn establishes new stakes around the matter of carbon's governance and restraint; when carbon is fixed to the body, especially the white body, talk of carbon pollution comes to imply both a challenge to one's powers of observation and one's social standing.

William Happer, for example, frequently brings a CO₂ monitor into his public talks on climate. Midway through his lectures he sometimes breaks from the podium (and all its hierarchical associations) to move to the side of the room where a monitor beeps repeatedly. He remarks, "The problem is guys, all of you 'enemies of the planet' are sitting in here breathing . . . and so this poor meter? The reason that it's squeaking is that the CO₂ levels in here are 1,700 [ppm] . . . so you might sit there and think about that. You're sitting here breathing in this pollutant. . . . Everybody feel okay?" His crowd laughs in affirmation.²²

Happer is a Princeton professor emeritus in physics and a former researcher with Strategic Missile Defense. He conducted much of the early research on the energy dynamics of atmospheric CO₂ and laser spectrology, all of which required highly technical apparatuses and modes of thermal modeling. He is therefore not one to dismiss the mediated nature of science out of hand. However, when I asked him about this strategy of cultivating a real-time, bodily awareness of CO₂ with his audience, he replied, "I bring [the monitor] in every chance I can to force people to think back on 'what is real, what can I touch?' and to question what they see on computer screens."²³

As this comment suggests, Happer holds that climate science and journalism largely lack a credible indexical foundation. "Observations," he insists, "anchor our understanding and weed out the theories that do not work. This has been the scientific method for more than three hundred years. . . . Properly used, computer models can

21. Specifically, William Happer and Patrick Moore. My attempts to contact other figures were not successful.

22. Happer, "Myth of Carbon Pollution."

23. Happer, interview by author, February 14, 2018.

enhance and speed up scientific progress. But they are not meant to replace theory and observation and to serve as an authority of their own.”²⁴

To Happer, the body alone has this authority. And, by imbricating the bodies of his almost entirely white audience in the sensation and evaluation of carbon dioxide during his lectures, Happer is able to draw new boundaries around where carbon dioxide is said to begin or end as a climate actor. He brings their breath, their resistance to its presumed toxicity, and their personal moral standing newly into focus, insisting that this too is part of the carbon story and the proper concerns of science and politics. In this way, he grounds climate questions in a form of epistemological populism, insisting that claims be evaluated not only by elite experts but also by everyday common sense and common corporeal experience.²⁵ However, like many forms of populism, common experiences are racialized. Redlined Black communities’ experiences of asthma, for instance, are not included in this invocation of breath and carbon benefit.²⁶

Sherwood B. Idso is another key figure in the carbon vitalist network who builds on Happer’s focus on the (white) body. He holds a PhD in soil science and has built both a career and a nonprofit around the study of carbon dioxide’s positive effects on plant life. His institute’s YouTube channel, like the witnessing practices of early British gentlemen’s science, contains several videos that are part treatise and part DIY instructable. In “Carbon Dioxide: The Breath of Life,” for example, Idso narrates the history of his experiments with his “poor man’s biosphere” constructed out of repurposed fish tanks and duct tape. Idso raises CO₂ concentrations in some of the tanks by holding a large plastic syringe to his mouth, exhaling his breath into the tool, and subsequently injecting it into the tanks. The video combines technical charts of tree biomass gains with approachable stills of Idso conducting his experiments in plain clothes, looking less like a laboratory scientist than an everyday working man tinkering in his basement. As a variation on the long-standing techniques of “virtual witnessing” in science writing, Idso invites his viewers to mentally simulate and verify the principles of his experiments.²⁷ He also establishes commonalities with his imagined audience, predicated on the display of his class (middle) and body (white and male).

Such positionality affords unique appeals to authoritative knowledge. As his video concludes, Idso stares directly into the camera and states,

Clearly, carbon dioxide is not a pollutant, based upon a multitude of experiments I have personally conducted . . . over the course of the last quarter century, in my own home, employing my own breath. . . . I have come to know, as well as I know anything, that carbon dioxide is truly the breath of life to nearly all species of plants on the face of the Earth and in the waters of its lakes, rivers, and oceans, as it also is to all of Earth’s

24. Happer, “Truth about Greenhouse Gases.”

25. For more on epistemological populism see Hatzisavvidou, “Climate Has Always Been Changing,” 7.

26. Lennon, “Decolonizing Energy,” 21.

27. Shapin and Schaffer, *Leviathan and the Air-Pump*, 60.

animals which are totally dependent upon the world's plants for the food they require to sustain themselves . . .

The video then fades to stills of Al Gore and the White House while Idso concludes, “. . . and for any person, any group, or any government to declare otherwise is an affront to all logic and a complete disavowal of reality.”²⁸

Idso's claims to epistemological certainty are twofold. First, like Happer, he stresses the tangible and observable over the simulated and inferred. He is able to represent CO₂ fixed into particularly sturdy and visible relations: his body, the definitive boundary of tank glass, and the extra size and weight of the ensuing plants. This apparatus holds carbon and climate within a tightly drawn circle, excluding marginalized standpoints or more mediatic knowledge claims. In another video, titled “Seeing Is Believing,” this point is further visually emphasized via the juxtaposition of quantitative data with two time-lapse videos of plants growing in different concentrations of carbon dioxide. “Atmospheric CO₂ is NOT a pollutant,” the video insists, because the CO₂-enriched plant plainly grows faster and larger.²⁹ Within the shelter of the tank glass and Idso's home, carbon is materially and symbolically fixed to life's corporeal weight in narrow terms.

Second, Idso's knowledge and declarative certainty are specifically grounded in the bodily exchange at the core of his experimental design: through carbon, Idso and his plants share breath. There is an intimacy and simplicity to this method that Idso calls on his viewers to respect (and potentially reproduce). To the contrast of federal regulators and climate modelers, he has directly and materially sustained the life of his subjects with his body. Carbon here serves as a kind of elemental medium, facilitating a corporeal effect through which Idso's theories can be tested and observed.³⁰ It speaks also to intimate ethical and authoritative claims that follow from practices of care, a parental knowledge of that which one has nurtured.

Prioritizing the body as a privileged site of epistemological and political claims is of course also a strategy germane to feminist science studies and ecofeminist theories. Idso and Happer's condemnations of computer models as disembodied and unaccountable further rhymes with a long-standing feminist tradition of anti-Cartesian critique, most particularly Donna Haraway's condemnation of the “god trick” of objectivity.³¹ Attempts such as Paul Edwards's to study and celebrate the processes of mutual trust and infrastructural labor that go into such models may succeed in nuancing the ways in which such views from nowhere are collaboratively composed, however publicly oriented scientific communications about climate rarely include this constructivist

28. Idso, “Carbon Dioxide.”

29. Center for the Study of Carbon Dioxide and Global Change, “Seeing Is Believing.” Emphasis in the original.

30. For more on elemental media see Starosielski, “Elements of Media Studies.”

31. Haraway, “Situated Knowledges,” 188.

attention.³² Instead, climate knowledge tends to be presented by scientists and civil society as neutral, remote, and universalizing.³³ In this context, carbon vitalism's bodily logics have a distinctly populist appeal.

Similarly, the imbrication of carbon vitalism's advocates' bodies within the environmental circulations of CO₂ both mirrors and distorts many ecofeminist claims about bodily care, risk, and experience. Stacy Alaimo's theory of transcorporeality, for example, combines new materialist models of intra-action and environmental justice struggles, focusing on personal experiences of the material exchanges between environments and bodies to refute hard distinctions between either category, arguing that, "the environment' is not located somewhere out there, but is always the very substance of ourselves."³⁴ This logic is eerily mimicked and disarmed in carbon vitalism, whose strategy of knowing carbon dioxide is predicated on disproving the presumed toxicity of a pollutant to the body, the body as polluting, and thus CO₂'s linguistic fix to the legal category of pollution. By emphasizing the mutually beneficial relations between plant and human bodies Idso is able to narrate forms of ecological and corporeal imbrication in which benefits, rather than harms, are mutually expressed. This does not present the fantasy of unmediated knowledge about the world, but rather a knowledge system in which unharmed, insular, and nurtured bodies play the principal mediating role: be they plants sheltered by tank glass or spokesmen and audiences sheltered by structures of race and class.

"Life Is a Carbon Cycle—Don't Break the Chain"

Within these appeals to bodily experience and authority are frequent calls to a shared, multispecies community constituted and connected by carbon dioxide and its vitalism, as demonstrated by the above motto of the Carbon Sense Coalition. This general strategy takes the narrowing of concerns accomplished by carbon vitalism's privileged bodily positioning as the filter through which forms of nonhuman life, as well as the moral claims and positive affects of life itself, must be screened. This component of carbon vitalist rhetoric appropriates and occupies not just ecofeminist knowledge and political strategies, but also those of the environmental movement more broadly. It strives to first communicate the ecological virtues of the carbon cycle and thereafter construct a poetics of fellow-feeling.

The chief rhetorical form of this strategy is juxtaposition. For example, like CEI's "Energy" TV spot, CO₂ Is Green begins one video with a series of clips of rolling clouds, ocean and plant life, young white children spinning on a merry-go-round, white elementary school girls walking through a suburban neighborhood, and a textbook illustration of an ecological food chain. This final image provides the means to interpret the

32. Edwards, *Vast Machine*.

33. Doyle, *Mediating Climate Change*, 24.

34. Alaimo, *Bodily Natures*, 4.

preceding clips; guided by carbon vitalist talking points, the viewer is meant to recognize the montage as an ecology of mutually beneficial carbon relations: white children, forests, and seaweed support and sustain one another in their molecular exchanges along the vitalist becomings of the carbon cycle. Leighton Steward emphasizes this by directly instructing the viewer in how to feel: “So rejoice! CO₂ is good!”³⁵

Implied in this juxtaposition is an appeal to life as an essential good and carbon dioxide as its atomic unit. This is often worked into metaphor. To Steward, CO₂ is “the staff of life.”³⁶ To Craig Idso, it is “the elixir of life.”³⁷ Patrick Moore, an ex-member of Greenpeace and frequent contributor to the carbon vitalist network, further insists that “CO₂ is the currency of life. It is the most important building block for all life on earth. All life including our own is carbon based. We shouldn’t be demonizing CO₂ as a pollutant, we should be celebrating the carbon cycle, which is the cycle of life.”³⁸

This construction and emphasis on life and carbon-mediated ecologies has obvious rhetorical ends. If human bodies (especially white bodies—the presumptive universal)—are centered in the definition of carbon dioxide and the carbon cycle, then the wholesale reclassification of carbon dioxide is also by extension the condemnation and judgement of these bodies as impure and befouling, violating long-held American racial scripts.³⁹ To insist on this conflation is thus to paint any potential mode of climate action as against the sanctity of (white) life itself.⁴⁰

Such arguments are of course wholly disconnected from the incremental policy measures proposed by EPA regulatory standards. The legal and linguistic fix between carbon dioxide and pollution does not extend to bodily emissions or eugenic ambitions, nor, within the scale of the climate system, is human respiration even very consequential. Carbon dioxide’s harms arise only through its secondary effects on scales that outpace the body. However, because some bodies—particularly white bodies—have considerable symbolic value, their connection to elemental circulations can serve to valorize and command a defense of larger webs of high-carbon relations.

The structure of such appeals combines the moral absolutism of pro-life rhetorical scripts with an expansive community of creation familiar to older forms of environmentalism. Inverting popular anxieties, and arguing with the outward appearance of ecological science, carbon vitalism takes the overwhelmingly large connections organized by the carbon cycle and provides a logical schema through which they can all be accommodated without conflict or sacrifice. It reopens an Arcadian sense of fellowship

35. Steward, “Is CO₂ Harmful?”

36. Steward, “Is CO₂ Harmful?”

37. Idso, “Mr. President.”

38. Moore, “TRUTH about Carbon Dioxide.”

39. Zimring, *Clean and White*.

40. For more on pro-life rhetoric and the appropriation of feminist strategy, see Harding, *Book of Jerry Falwell*, 185.

and conservation, seemingly lost in recent mechanistic or stochastic turns in ecological science,⁴¹ by appropriating the rhetorical tactics of its environmentalist opposition.

When taken to its full extent, the argument for carbon dioxide as life rather than as pollution casts humans not just as benefactors, but as saviors of life on geologic time-scales. To Patrick Moore, this is a Gaian story and a “secular miracle.”⁴² Arguing that preindustrial CO₂ levels were on track to dip below 150 ppm within the next millennium, below the minimum level to support plant (and therefore virtually all) life, human interventions in the atmospheric system thus appear as a last-hour reversal. As Moore sees it, “We came along just as Gaia was about to perish. . . . Our emissions have brought balance back to the carbon cycle.”⁴³

Anthropogenic carbon emissions, rather than careless pollution, are thus recast as a form of human-to-nonhuman stewardship.⁴⁴ Moore’s commitments to this end are so extensive that he has argued that, even when all the fossil fuel reserves on the planet have been burned, humans will have a moral responsibility to continue CO₂ emissions by other means, perhaps incinerating limestone with solar power.⁴⁵ This coda to the story keeps the generic category of the human, rather than the accidental benevolence of the fossil fuel industry, as the hero of the story.

In this reconfiguration of valued bodies, life forces, and ecological connections carbon vitalists make both an argument about how to feel (good) about and through the carbon cycle as well as a critique of the management of this question within mainstream environmentalism. “On the other side of it,” Moore explains to me, one is confronted by “the self-loathing aspect of being a human and being the only real bad species on the face of the earth. It’s as if disease agents are better than we are.”⁴⁶ Carbon vitalism offers narrative and emotional safety in a public sphere full of such accusations. As studies on the psychology of climate change have long observed, denial and apathy often serve as strategies of emotional avoidance in the face of feelings of powerlessness and guilt.⁴⁷ The bodily analytics of carbon vitalism invite a further, quasi-intersectional analysis of this emotional positionality, paralleling the racial structures of fragility and insulation long observed in critical whiteness studies.⁴⁸ Because carbon

41. Worster, *Nature’s Economy*, 81.

42. Patrick Moore, interview by author, February 12, 2018. The exclusively secular interpretation of this miracle may be questioned to an extent as other junctures of the carbon vitalist network often include Evangelical political blogs.

43. Patrick Moore, interview by author, February 12, 2018. For more on the long-standing connections between Gaia theory and climate denial, see Aronowsky, “Gas-Guzzling Gaia.”

44. Here we see an interesting parallel to the Anthropocene debates and the hazards of collapsing of distinctions between different culture and social formations within the rhetorical invocation of the human species.

45. Moore, “Positive Impact,” 18.

46. Patrick Moore, interview by author, February 12, 2018.

47. Norgaard, *Living in Denial*; Lertzman, “Tackling Apathy and Denial.”

48. DiAngelo, “White Fragility,” 62. See also studies of identity and motivated reasoning in climate communication such as Kahan et al., “Culture and Identity-Protective Cognition”; Pearson et al., “Race, Class, Gender.”

dioxide emissions are so endemic to modern modes of life, it is especially hard for white, Global North individuals to think seriously about personal and collective responsibilities for rising CO₂ levels without provoking considerable anxiety (and in turn a desire to shed it). What carbon vitalism lacks in scientific rigor it makes up in a nostalgic return to a kind of human-nature concord once possible for many white Americans but which has, over the past decades, been placed under radical revision. In doing so, carbon vitalism serves as a defensive move for privileged subjects unaccustomed to weighing questions of complicity, making environmentalism an emotionally safe position from which to feel again.

Ironically, this rejection of scientific nature/culture divisions and disinterested presentations of data achieves what climate communication scholars have called on environmentalists to perform for years. Carbon vitalism, as effective modes of communication are frequently theorized to achieve, centers not just human action, but human meaning, refusing to frame environmental issues as external problems.⁴⁹ It manifests what many have articulated as the end goal of the project of socially situated knowledge—that which Shelia Jasanoff describes as “mutually sustaining interactions between our sense of the *is* and the *ought*: of how things are and how they should be.”⁵⁰ It does so, however, by reproducing forms of racial, economic, and geopolitical privilege and exclusion. Denialist calls for a new carbon imaginary are thus simultaneously both threats to viable climate action and models of what we might hope to achieve if climate activism began to think more reparatively about its own narratives, affects, and epistemological projects of community formation.

Conclusions and Future Directions

Taking stock of carbon vitalism requires the study of its rhetorical craft and successes as well as speculation about its future. What might have seemed like a fringe ideology within a larger community of climate denial has endured past its reactive formations in 2007 and made several inroads to positions of federal power. In 2018–19 Happer joined the Trump cabinet and was successful in blocking State Department testimony on climate risk. He has since rejoined the CO₂ Coalition with Mandy Gunasekara, a former EPA appointee who claims to have driven the Trump administration’s withdrawal from the Paris Agreement.⁵¹ Scott Pruitt, former EPA director and longtime opponent of the CO₂ endangerment finding, was selected by a carbon vitalist transition team and championed a red team/blue team debate structure within the EPA to institutionalize and legitimate climate denialist perspectives. John Christy, the first science adviser confirmed to the EPA’s red team caucus, holds these views, while Craig Idso was a likely future candidate.⁵² The Department of the Interior systematically promoted the presumed

49. Doyle, *Mediating Climate Change*, 4.

50. Jasanoff, “New Climate for Society,” 236.

51. Waldman, “Why a High-Profile Climate Science Opponent Quit.”

52. Gattis, “Seven Questions”; Mooney and Dennis, “Next Wave of EPA Science Advisers.”

benefits of carbon dioxide in its reports since 2015.⁵³ Last March Trump tweeted a quote from Patrick Moore, noting “‘The whole climate crisis is not only Fake News, it’s Fake Science. There is no climate crisis, there’s weather and climate all around the world, and in fact carbon dioxide is the main building block of life’ . . . Wow!”⁵⁴

Carbon vitalism still finds traffic online and in social media. Conservative blogs and think tanks continue to publish commentaries and white papers on carbon dioxide’s benefits, even after the regulatory threat of the Obama EPA has passed. The CO₂ Coalition has recently increased its outreach on Facebook, taking advantage of their content’s status as opinion, exempting it from fact checking.⁵⁵ On Twitter, a search for “CO₂” and “Life” reveals a highly active network of accounts repeating iterations of carbon vitalist arguments and graphics multiple times a day. Call them trolls or call them a counterpublic—they keep the cultural politics of carbon vitalism well alive.

The gains made by this worldview are depressing for the prospects of climate action, but also signal an opportunity for environmental thinking. They demonstrate that, against stereotypes of careless anthropocentrism, skeptics and conservatives often want for ecological and nurturing narratives as well as embodied modes of producing and interpreting knowledge. Rather than crying conspiracy, climate scholars and activists could instead cry theft. There is much to be gained by reoccupying this rhetorical ground and set of strategies.

Feminist STS remains urgent in this context. Critiques of objectivity and theories of transcorporeality were developed to argue for the legitimacy of experiential knowledge otherwise unintelligible to political and scientific elites within contemporary risk society and its inequitable production of slow violence. Against narrow empiricist standards, they insisted on bodily experience as an epistemological good. An acknowledgment of embodied knowledge invited and legitimated gendered and racial analyses extending from early ecofeminist and environmental justice formations, emphasizing the disproportionate harms experienced by women and people of color in contexts of ecological upheaval.⁵⁶

I maintain that there is nothing fundamentally wrong with these theoretical tools, only the hands that wield them. Carbon vitalism applies these methods to the enclosing positionality and ideological formations of racial and classed subjects that largely do not experience material harm, and thus cannot produce adequate knowledge about the differential effects of climate change. It further bears a particularly toxic relation to white women and girls’ bodies as frequently imagined objects requiring protection from regulatory forces outside the family or the nation. In insisting on this narrow epistemological foundation it benefits from and reproduces longstanding ideologies of white

53. Tabuchi, “Trump Insider.”

54. Trump, “Whole Climate Crisis.”

55. Waldman, “How CO₂ Boosters’ Op-Ed Slipped.”

56. Nanda, “History Is What Hurts,” 367; Kirk, “Standing on Solid Ground,” 347.

supremacy, patriarchy, and classism, contributing to the advancement of reactionary cultural politics. It excludes from view globally distant and/or racialized places where fossil fuel pollution and climate change are already producing a cascade of disasters. Intersectional analyses of climate change are thus refused by the central role of white embodiment and fragility in the epistemological and affective worlds of carbon vitalism. On this front, our politics can only be one of refusal.

However, this does not preclude scholars and activists from articulating alternative stories about carbon, bodily knowledge, and ecological connection that provide spaces for positive feelings or that are open to the participation of privileged individuals. CO₂ is culturally capacious, and in projects such as the Green New Deal, Leap Manifesto, or regenerative agriculture, there are encouraging glimpses of what it might look like and feel like (to borrow a phrase from Kim Tallbear) to be in good relation across the carbon cycle.⁵⁷ To build larger and more urgent coalitions of care, narratives and emotional on-ramps are needed for larger coalitions of people to coordinate their sense of self-identity with a progressive program of climate action. It is important that these narratives provide a sense of shared ownership over knowledge claims and the communities in which care work can be enacted and achieved.

However, as this study demonstrates, there is a need to continually examine and question the social formations and bodies that get to mediate and order the material and symbolic relations that ground carbon knowledge in climate politics. This predicament may require a return to something like Sandra Harding's theory of strong objectivity, in which the imbrication of a speaker within systems of harm and oppression is recognized as an epistemological strength in the task of producing knowledge about that system.⁵⁸ Such a return to embodied standpoint theory would also provide greater attention toward the racial and colonial dimensions of climate change, which remain significant factors in the materialization of violences both slow and fast. Further theories and methods may need to be invented and practiced to cross this gap between bodily forms of meaning and oppression and the wider material configurations of a changing climate.⁵⁹ To this end, body politics will remain a central analytic and practical concern within both climate communications and wider social movement strategies.

57. The Leap Manifesto is a document produced through dialogues between Canadian labor, faith, environmental, and Indigenous communities. It provides "a call for a Canada based on caring for the Earth and one another" through a range of policies including energy democracy initiatives, the recognition of Indigenous rights, and the reframing of care work as climate work. Regenerative agriculture is a set of land management practices designed to increase soil carbon levels and ecological resilience by rearranging relations among animals, prairie grasses, and chemical inputs. Kim Tallbear's vocabulary of relations is developed through Dakota principles and an auto-ethnographic exploration of settler and nonsettler kinship structures. See TallBear, "Caretaking Relations."

58. Harding, *Objectivity and Diversity*.

59. A converse hazard in this discussion is the problem of 'deference epistemology.' See Táiwò, "Being-in-the-Room Privilege."

For all that carbon vitalism gets wrong or misconstrues, there is still value in recognizing that carbon does belong to a fundamentally transcorporeal set of flows that connect all people and all forms of organic matter. The ethical potential of this observation, and its call to participate in the maintenance and flourishing of the community of life, need not be abandoned or forgotten. The task is now to find ways to communicate and sense this bodily connection across nonlinear scales of climate disruption—and by fixing carbon into more expansive and just structures of relation—rather than the logics of toxicity or the exclusive privilege of law. This calls us to create new structures of feeling (toward) the carbon cycle.

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