Throwing Cold Water on Climate Reparations

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ABSTRACT: In this Essay, I dispute the increasingly common claim that the pollution and other excesses from the developed nations of the Industrial West have, given their capitalist economies, forced global warming on the rest of the world, for which reparations are not only appropriate but also a moral imperative. But the counterarguments are decisive against these bold claims. First, the scientific evidence does not support that reparations claim, or indeed give, any estimate of what those amounts should be. Capitalist economies are in fact far more efficient both in reusing and in disposing of it. Local disasters in Maui and the Pacific Palisades were largely due to pervasive poor forest management, not climate change. The three major examples of those negative physical harms include the supposed sinking of the Pacific Islands, the decimation of the coral reef, and the decline in the polar bear population, all of which are either outright incorrect or subject to serious empirical doubt. The global warming models are overly pessimistic because they ignore the favorable effects of photosynthesis, the critical role of water vapor in determining global temperatures, and all the other possible explanations for the complex dynamics of climate change, given that vast changes in ice covering long preceded any human development. Their case for reparations flounders on the inability to identify unique causation from the Industrial West on which the claim rests. It also overlooks both natural causes and the dangerous activities undertaken by nations claiming reparations, while refusing to discuss the many ways that the Industrial West has provided benefits to less developed nations through direct investment and trade policies.

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In the interests of full disclosure, I have had an active role in defending these climate change cases in litigation.

INTRODUCTION: THE DANGEROUS GROUNDSWELL FOR CLIMATE REPARATIONS 2016

I. FALSE DOOMSDAY PREDICTIONS 2021

II. THEORETICAL FOUNDATIONS FOR GLOBAL WARMING 2027

III. THE SHAKY CASE FOR CLIMATE REPARATIONS 2035

CONCLUSION 2042

INTRODUCTION: THE DANGEROUS GROUNDSWELL FOR CLIMATE REPARATIONS

The voices in favor of reparations from developed to developing and undeveloped nations for climate "loss and damages" are louder and more insistent today than ever before. The United Nations' ("U.N.") war cry places rectification for these losses at the top of any climate agenda. The condemnation is not only in the here and now, for the U.N.'s suspicious finger dates the original sin to the dawn of the industrial revolution.[1] The dominant trope is that the Industrial West, with its for-profit corporations, created the mess that the rest of the world must bear.

> The global climate crisis is, fundamentally, a crisis of inequality. The climate crisis is fueled by the historic emissions of industrial countries and fossil fuel corporations, yet the impacts are borne most heavily by the nations and peoples who have contributed least to the crisis. . . . Leaders of vulnerable nations, scholars, and climate justice advocates have called for global climate reparations between states or payments from corporations to impacted communities to address this debt.[2]

The indictment then links the current malaise to "Mother Earth" to decrepit capitalist institutions:

> The capitalist system has imposed on us a logic of competition, progress and limitless growth. This regime of production and consumption seeks profit without limits, separating human beings from nature and imposing a logic of domination upon nature,

1. *C.f.* Sara Schonhardt & E&E News, *5 Things to Know About Climate Reparations*, SCI. AM. (Oct. 25, 2022), https://www.scientificamerican.com/article/5-things-to-know-about-climate-reparations [https://perma.cc/N5Q2-DHDR] (describing climate reparations as "loss and damage" in "U.N. speak" and defining it as an "account[ing] for the economic toll of climate-fueled disasters, such as floods, wildfires and hurricanes").

2. Adrien Salazar, *The Case for Climate Reparations in the United States*, ROOSEVELT INST. 3–4 (Apr. 2023), https://rooseveltinstitute.org/wp-content/uploads/2023/04/RI_The-Case-for-Climate-Reparations_Brief_202304.pdf [https://perma.cc/6EY4-7NSP].

> transforming everything into commodities: water, earth, the human genome, ancestral cultures, biodiversity, justice, ethics, the rights of peoples, and life itself.[3]

This same theme is also articulated in Professor Carlton Waterhouse's contribution to this Issue, which begins with an extensive list of citations that purport to explain why the climate crisis is upon us, but none of these references establish the causal connection between increases in levels of carbon dioxide and the social dislocations that are attributable to them, when they refer only to "climate change" writ large as the source of the current malaise.[4] Indeed, Waterhouse reviews other scholarship that argues that "climate change represents the continuing harms of colonialization and slavery for Global South countries forced to bear the harms of climate change grounded in the history of European imperialism and racial capitalism"[5] — in

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3. *People's Agreement of Cochabamba*, WORLD PEOPLE'S CONF. ON CLIMATE CHANGE & RTS. OF MOTHER EARTH (Apr. 22, 2010), https://pwccc.wordpress.com/2010/04/24/peoples-agreement [https://perma.cc/RSM3-2YC5].

4. *See* Carlton Waterhouse, *Climate Redress: Loss and Damage, Compensation and Reparations*, 110 IOWA L. REV. 2201, 2022–03 (2025) (citing *Climate Change Impacts on Ecosystems*, U.S. ENV'T PROT. AGENCY (Jan. 23, 2025), https://www.epa.gov/climateimpacts/climate-change-impacts-ecosystems [https://perma.cc/ZAR7-KYRE] (discussing how climate change impacts ecosystems and the animals that live within them); *Climate Change Impacts*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (April 2, 2025), https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts [https://perma.cc/P97D-C7GY] (discussing how climate change affects infrastructure); *Extreme Weather and Climate Change*, NAT'L AERONAUTICS & SPACE ADMIN. (Oct. 23, 2024), https://science.nasa.gov/climate-change/extreme-weather [https://perma.cc/UTU7-XX6V] (linking human actions like the burning of fossil fuel to climate change); Chris Parsons, *The Pacific Islands: The Front Line in the Battle Against Climate Change*, U.S. NAT'L SCI. FOUND. (May 23, 2022), https://new.nsf.gov/science-matters/pacific-islands-front-line-battle-against-climate [https://perma.cc/DM84-9TUY] (reporting that climate change may result in instability to the island systems of the Pacific Islands); Oliver Milman, *Oil Firms Knew Decades Ago Fossil Fuels Posed Grave Health Risks, Files Reveal*, GUARDIAN (Mar. 18, 2021, 5:00 AM), https://www.theguardian.com/environment/2021/mar/18/oil-industry-fossil-fuels-air-pollution-documents [https://perma.cc/D4R6-5L7U] (reporting the oil industry's knowledge of the serious human health risks from burning fossil fuels); *Climate Change in the 1970s*, AM. INST. OF PHYSICS, https://history.aip.org/exhibits/climate-change-in-the-70s/index.html [https://perma.cc/JXD2-BA3G] (tracing the records of anthropogenic climate change from the 1970s); *History of the Convention*, UNITED NATIONS CLIMATE CHANGE, https://unfccc.int/process/the-convention/history-of-the-convention [https://perma.cc/9U83-XYJP] (tracing the history of the United Nations Framework Convention on Climate Change); *Progress Cleaning the Air and Improving People's Health*, U.S. ENV'T PROT. AGENCY (Mar. 19, 2025), https://www.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health [https://perma.cc/H2X3-RJBY] (discussing the success of the Clean Air Act in reducing emissions thereby improving air quality); *Global Greenhouse Gas Overview*, U.S. ENV'T PROT. AGENCY (Mar. 31, 2025), https://www.epa.gov/ghgemissions/global-greenhouse-gas-overview [https://perma.cc/8TT9-XX4X] (analyzing global greenhouse gas emissions by economic sector and country)).

5. Waterhouse, *supra* note 4, at 2218 (citing Sage Howard, *Slavery Fueled Our Climate Crisis. Here's How Reparations Can Slow It Down*, NAT'L AFR.-AM. REPARATIONS COMM'N (Aug. 16, 2022), https://reparationscomm.org/reparations-news/slavery-fueled-climate-crisis-reparations-can-slow-it-down [https://perma.cc/3LXQ-VY7C]).

an essay that does not even mention carbon dioxide. In this Essay, that gas is my major source of concern, given its dominant position as a greenhouse gas. Prior to this discussion, Waterhouse gives an extensive classic account of the interconnected theories of corrective justice and reparations,[6] but fails to establish the causal nexus that call those principles into play.

In making this claim, Waterhouse joins with the many critics of capitalism with its heavy dependence on fossil fuels, all of whom locate these assertions about climate change in a larger set of corrupt social institutions. But they offer neither a formal demonstration of the case nor particular instance of the linkage between carbon dioxide at one place and environmental harm at another. Indeed, they ignore the enormous advances in environment safety that come from superior technology and sensible government actions.[7] Thus the critics of capitalism decry, for example, so-called robber barons, such as the meat magnates Gustavus Swift and Philip Armour, for their supposed historic misdeeds. Yet these titans of industry used market mechanisms to turn waste products that had previously leached into the soil and rivers and fouled the air into inputs for other marketable goods, who first turned wasted offal, blood and bone into fertilizer, sausage and headcheese, textiles, clothing, jewelry ornaments, pigments and dyes, pharmaceuticals perfumes, glues, pepsin, and soap.[8] These self-regulating actions negate externalities while government regulations on climate change do the opposite, as with the massive destruction that has taken place in both Maui in 2023,[9] and more recently in Los Angeles and the Pacific Palisades in early January 2025.[10] In

6. Waterhouse, *supra* note 4, at 2203–10.

7. *See, e.g.*, Steven Cohen, *Economic Growth and Environmental Sustainability*, COLUM. CLIMATE SCH. (Jan. 27, 2020), https://news.climate.columbia.edu/2020/01/27/economic-growth-environmental-sustainability [https://perma.cc/WD3Y-8YYM] ("It's really quite simple: with public policies ranging from command-and-control regulations to direct and indirect government subsidies, businesses and governments developed and applied technologies that reduced pollution while allowing continued economic growth. This is not a fantasy, it is history. In the 1960s you could not see the mountains from downtown Los Angeles; today you can. In the 1960s you could not ride a bike on a path next to the Hudson River; today you can.").

8. *See* Pierre Desrochers & Andrew Smith, Rent-Seeking Entrepreneurship and the Circular Economy: Cautionary Insights from the History of the American Meatpacking Industry 11–15 (Feb. 2025) (unpublished manuscript) (on file with the *Iowa Law Review*). A circulatory economy is one in which the waste from one process is used as input to allow for sustainable environmental improvements. *Id.* at 1, 3.

9. *See, e.g.*, John P. Rafferty, *Maui Wildfires of 2023*, BRITANNICA (Mar. 25, 2025, 10:21 AM), https://www.britannica.com/event/Maui-wildfires-of-2023 [https://perma.cc/Y5ML-SZCH] (noting broken power lines as a possible source of the fires that killed 102 and destroyed or damaged nearly 3,000 structures).

10. For one of literally dozens of such accounts, see Jason L. Riley, Opinion, *The Governance Failures that Fed the Los Angeles Wildfires*, WALL ST. J. (Jan. 14, 2025, 4:48 PM), https://www.wsj.com/opinion/the-governance-failures-that-fed-the-los-angeles-wildfires-ebfafdf3 (on file with the *Iowa Law Review*) (quoting former gubernatorial candidate Bill Simon, "There's a public-policy failure somewhere here. There's a direct connection between the negligence at the governmental level—state, local, whatever—and a lot of human suffering"); *see also* Hayley Smith, A *Single, Devastating*

both these cases the damages were local not global, and they were not attributable to global warming, but to the total incompetence of local and state governments in removing dead wood, maintaining fire hydrants and power lines, filling empty reservoirs, having competent governors and mayors, and hiring competent staffs.[11] Climate changes are always involved, but these appear attributable not to carbon dioxide levels but to the fluctuation between wet and dry seasons, which requires constant maintenance so that the extra growth during wet years is removed before the dry years set in. Yet for these multibillion localized losses, there are no reparations, and no global implications.

Why then think that reparations are appropriate for some diffuse notion of climate change when what happened bears no relationship to income inequality, fossil fuels, and none to the failure of private property institutions? Why think that carbon dioxide had anything to do with the local disaster, even if it is a substance that moves uniformly across the globe? Its unique place and pervasive presence raise distinctive issues that require special attention. There is no disagreement about calling sulfur dioxide, nitrous oxide, and a thousand other substances pollutants, which have long been targeted for regulation in developed countries in ways that do not fit the above critique.

The purpose of this Essay is to explain why bad science and bad political posturing lead to bad systems of regulation. Part I shows how many dire predictions of climate change, often made years or decades ago, turned out to be flatly wrong notwithstanding efforts by climate change advocates to explain them away. Yet no theory of reparations requires that compensation be given when there is no harm caused, especially if the demonstrable benefits of carbon dioxide, ignored by Waterhouse and others, are taken into account.[12] Part II then offers a theoretical explanation as to why these observed negative results are consistent with scientific theory that insists on taking prophylactic measures, annually costing trillions to achieve net-zero carbon emissions. It is critical not to jump over these scientific disputes because the case for reparations weakens as these scientific claims of loss and damage become ever more questionable. Part III then examines claims for reparations that are common today in so many areas, and it finds that the exacting conditions under which these payments are justified on either moral or legal grounds are not satisfied in the global warming area and thus ought to be summarily rejected. The categorical rejection of these dubious claims is to be highly

California Fire Season Wiped Out Years of Efforts to Cut Emissions, L.A. TIMES (Oct. 20, 2022, 5:00 AM), https://www.latimes.com/california/story/2022-10-20/california-wildfires-offset-greenhouse-gas-reductions (on file with the *Iowa Law Review*) (providing an account of the massive carbon releases from the 2020 fires in California); Jeremy B. White, *Trump Blames California for Wildfires, Tells State 'You Gotta Clean Your Floors*,' POLITICO (Aug. 21, 2020, 12:24 AM), https://www.politico.com/states/california/story/2020/08/20/trump-blames-california-for-wildfires-tells-state-you-gotta-clean-your-floors-1311059 [https://perma.cc/H2F4-535D] (noting concerns with state action as a contributing factor to California's wildfires).

11. *See, e.g.*, Riley, *supra* note 10.

12. *See supra* notes 4–7 and accompanying text.

desirable because the dollars that are diverted to deal needlessly with carbon dioxide control and reparations are dollars that cannot be spent to deal with the more direct causes of disease and poverty throughout the world.

Thus, let it be assumed that we need to take collective action to prevent various forms of pollution. It hardly follows that we should commit vast resources to the development of electric vehicles that do not work well on hills and in cold weather, that are difficult to recharge on long trips, and require fossil fuels to power the fueling changes, which I believe explains why, except in niche situations, the overall demand for these vehicles has slowed.[13] There is a far higher rate of return for making both traditional gasoline engines and hybrids more efficient than they currently are instead of subsidizing a dicey market of electric vehicles whose well-known technical disadvantages cannot be overcome in any system of rational private investment.

Even before the disastrous fires in Los Angeles, California Governor Gavin Newsom doubled down on his misguided climate program in a new executive order[14] that reaffirmed an earlier order by then California Governor Edmund Brown that called for the elimination of all fossil fuels by 2045,[15] without any idea on how best to get there. Now eleven years later, nothing has been done at the local level; even the rate increases for electricity of fifty-seven percent are twice the national level.[16] After the Los Angeles fires, Newsom wanted federal relief.[17] Today, the Southern California fires vividly show the

13. *See, e.g.*, Peter Johnson, *GM Expects Lower 2024 EV Production After Killing Its Most Popular Model*, ELECTREK (June 11, 2024, 10:19 AM), https://electrek.co/2024/06/11/gm-lowers-2024-ev-production-goal-after-killing-most-popular-ev [https://perma.cc/3SR3-Y78T] (noting that GM has experienced "slower-than-expected EV demand in the US"); Kerry Jackson, *The Wreck of the Electric Vehicles*, PAC. RSCH. INST. (Dec. 12, 2023), https://www.pacificresearch.org/the-wreck-of-the-electric-vehicles [https://perma.cc/V3MN-HNBY] (noting several criticisms of electric vehicles); Warren Clarke, *How Does EV Range Vary in Different Conditions?*, U.S. NEWS (Aug. 5, 2024), https://cars.usnews.com/cars-trucks/advice/how-does-ev-range-vary-in-different-conditions [https://perma.cc/UY3N-QQF8] (noting reduced electric vehicle performance in several conditions).

14. *Governor Newsom Issues Executive Order Tackling Rising Electric Bills*, GOVERNOR GAVIN NEWSOM (Oct. 30, 2024), https://www.gov.ca.gov/2024/10/30/governor-newsom-issues-executive-order-tackling-rising-electric-bills [https://perma.cc/8BHP-QVTU] (maintaining California's commitment to relying completely on clean energy by 2045).

15. *Governor Brown Signs 100 Percent Clean Electricity Bill, Issues Order Setting New Carbon Neutrality Goal*, CA.GOV (Sept. 10, 2018), https://archive.gov.ca.gov/archive/gov39/2018/09/10/governor-brown-signs-100-percent-clean-electricity-bill-issues-order-setting-new-carbon-neutrality-goal/index.html [https://perma.cc/ET2A-68X2] (committing to one-hundred percent clean energy for the state by 2045 in conjunction with a bill that established a similar framework).

16. Editorial Board, Opinion, *Gavin Newsom Wants a Climate Bailout*, WALL ST. J. (Nov. 1, 2024, 5:47 PM), https://www.wsj.com/opinion/gavin-newsom-california-electricity-rates-7c0942c1 (on file with the *Iowa Law Review*).

17. Kristin Chapman & Max Rego, *California Gov. Newsom Requests Nearly $40 Billion in Wildfire Recovery Funding in Letter to Congress*, CNN POL. (Feb. 22, 2025, 4:37 AM), https://www.cnn.com/2025/02/22/politics/california-wildfires-newsom-aid-request-letter/index.html [https://perma.cc/K4NC-BUGT] (requesting "$16.8 billion in public assistance funding, $9.9 billion for house and business repairs, $9.61 billion in business loans and grants and $2 billion in low-income housing tax credits").

folly of his priorities, with current insurable losses estimated as high as $275 billion,[18] when there is only $200 million in cash in the state fund. About $2.5 billion is needed to cover these losses, so that to pay for them, all homeowners statewide are at risk for heavy fees.[19] Yet the massive carbon dioxide emissions from the 2020 fires in Northern California wiped out all the gains in emission reductions from 2003 to 2019,[20] which is doubtless far truer today in Los Angeles. That debacle will have to play itself out. What is needed now is policy that places fire prevention and property renewal at the top of the agenda.

I. FALSE DOOMSDAY PREDICTIONS

The case for climate control and climate reparations has long been backed by a large number of public officials and organizations that treat that matter as one with the highest priority. At the global level, U.N. Secretary-General António Guterres gives voice through his many doomsday projections, including "Secretary-General Calls Latest IPCC Climate Report 'Code Red for Humanity', Stressing 'Irrefutable' Evidence of Human Influence,"[21] and by insisting that "dramatic, immediate climate action," is needed to deal with the situation in which "humans are to blame."[22] More recently, he has written that

18. Lydia DePillis, *Economic Toll of Los Angeles Fires Goes Far Beyond Destroyed Homes*, N.Y. TIMES (Jan. 15, 2025), https://www.nytimes.com/2025/01/15/business/economy/los-angeles-fires-economy.html (on file with the *Iowa Law* Review) (providing an estimate from AccuWeather, though noting that some believe those estimates to be too high).

19. Jean Eaglesham & Sara Randazzo, *Insurers' Rule Change Puts California Homeowners on the Hook for L.A. Fire*, WALL ST. J. (Jan. 15, 2025, 2:12 PM), https://www.wsj.com/finance/insurers-rule-change-puts-california-homeowners-on-the-hook-for-l-a-fire-88336040 (on file with the *Iowa Law Review*).

20. Michael Jerrett, Amir S. Jina & Miriam E. Marlier, *Up in Smoke: California's Greenhouse Gas Reductions Could Be Wiped Out by 2020 Wildfires*, 310 ENV'T POLLUTION, Aug. 5, 2022, at 1, 2 (finding "that approximately 127 [million metric tons of carbon dioxide equivalent] were emitted in 2020" from wildfires and comparing these emissions to the decrease from 2003 to 2019 of 65 million metric tons of carbon dioxide equivalent decrease per year).

21. Press Release, Secretary-General Calls Latest IPCC Climate Report 'Code Red for Humanity', Stressing 'Irrefutable' Evidence of Human Influence, U.N. Press Release SG/SM/20847 (Aug. 9, 2021), https://press.un.org/en/2021/sgsm20847.doc.htm [https://perma.cc/M6BW-BUUM].

22. António Guterres, U.N. Sec'y-Gen., Secretary-General's Opening Remarks at Press Conference on Climate (July 27, 2023), https://www.un.org/sg/en/content/sg/speeches/2023-07-27/secretary-generals-opening-remarks-press-conference-climate [https://perma.cc/M7VV-7KW3].

For my criticism of his intense concern with the 1.5°C threshold, see Richard A. Epstein, *Global Warming: How Not to Respond*, HOOVER INST. (Aug. 17, 2021), https://www.hoover.org/research/global-warming-how-not-respond [https://perma.cc/PP6W-NFWD]. The subtitle—"Think first of marginal adjustments before resorting to massive changes"—warns against taking extreme moves, when smaller ones make sense. For a defense of the all-in policy, see generally Richard L. Revesz, *Fallacies in the Design of Climate Change Policies: A Response to Richard Epstein*, 10 TEX. A&M L. REV. 385, 388 (2023) (arguing that "taking modest steps . . . . is a terrible prescription for the regulation of greenhouse gas emissions"); and my response, Richard A. Epstein, *A Modern Defense of Simple Rules for a Complex World*, 10 TEX. A& M L. REV. 581, 583–96 (2023).

"[t]he era of global warming has ended; the era of global boiling has arrived."[23] No particulars are offered, and he makes no reference to positive effects of the huge decline in coal consumption that took place between 2010 and 2020, which has continued by another eight percent in 2023.[24] Market institutions have already done much to remove the most dangerous pollutants from the air, without any form of regulation.[25]

That same type of global condemnation of global warming is part of the tool kit of former President Joseph Biden, who in one recent White House announcement referred four times without documentation to global consequence of the "climate crisis," which in his view has thrown additional burdens on military preparedness.[26] In earlier statements, he has addressed matters close to the key issue of climate reparations: "Extreme heat—this is a—I think going to surprise a lot of people—not you all—but extreme heat is the number one weather-related killer in the United States. More people die from extreme heat than floods, hurricanes, and tornadoes combined."[27]

There is only one objection to his observation—namely, that it is wrong, for Biden never mentions cold weather. As Bjorn Lomborg has pointed out: "[W]hile extreme heat kills nearly 6,000 Americans each year, cold kills 152,000, of which 12,000 die from extreme cold. Even including deaths from moderate heat, the toll comes to less than 10,000."[28] The explanation in large part relates to the use of air conditioning, an energy-intensive initiative that saves lives.

Biden's remarks were not some inadvertent error. Instead, they rest on a well-publicized set of examples that proponents of climate change have put forward to show the gravity of the current situation.[29] I did not cherry pick the

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23. Guterres, *supra* note 22.

24. *See* Jonathan Church & Mark Morey, *U.S. Coal Shipments Declined 8% in 2023 as Coal Consumption Fell Sharply*, U.S. ENERGY INFO. ADMIN. (July 16, 2024), https://www.eia.gov/todayinenergy/detail.php?id=62484 [https://perma.cc/4E95-97RF] (showing a decrease in coal shipped from 957 million tons in 2010 to 422 million tons in 2023 and highlighting how coal consumption follows this trend closely).

25. *See* Chris Peterson, *U.S. Coal-Fired Electricity Generation Decreased in 2022 and 2023*, U.S. ENERGY INFO. ADMIN. (May 10, 2024), https://www.eia.gov/todayinenergy/detail.php?id=62043 [https://perma.cc/8DYX-ZYHM] (discussing how the reduction in coal-fired electricity is due to various factors, including the "grid managers generally select[ing] the lowest cost power available . . . which in recent years has usually been wind, solar, and natural gas rather than coal").

26. Press Release, White House, A U.S. Framework for Climate Resilience and Security (Sept. 20, 2024), https://bidenwhitehouse.archives.gov/briefing-room/press-briefings/2024/09/20/a-u-s-framework-for-climate-resilience-and-security [https://perma.cc/WN2G-J4BG].

27. Joseph Biden, President, Remarks by President Biden on Extreme Weather (July 2, 2024), https://bidenwhitehouse.archives.gov/briefing-room/speeches-remarks/2024/07/02/remarks-by-president-biden-on-extreme-weather [https://perma.cc/C7P2-TCQ9].

28. Bjorn Lomborg, Opinion, *Polar Bears, Dead Coral and Other Climate Fictions*, WALL ST. J. (July 31, 2024, 5:32 PM), https://www.wsj.com/articles/polar-bears-dead-coral-and-other-climate-fictions-528b18ea (on file with the *Iowa Law Review*).

29. *See, e.g.*, *Causes and Effects of Climate Change*, UNITED NATIONS: CLIMATE ACTION (listing effects of climate change, including hotter temperatures, more severe storms, increased drought,

examples discussed below. Rather, these were all the poster children selected by the defenders of current climate policies, in part to back up the demand for reparations.[30] They now are largely falsified by subsequent events.

The first exemplar of the then-incipient climate crisis relates to "the Pacific island nation of Tuvalu, which is rapidly losing its coastline to rising seas."[31] Lomborg, in his Wall Street Journal piece, also refers to polar bears and coral formations, where again in neither case the dire predictions of impending doom panned out.[32] Thus in 2004, The Washington Post published a jeremiad that said that the polar bears faced extinction.[33] Susan Crockford has long defended the lonely position that, notwithstanding the shifts in the Arctic Ocean, the polar bear population was not in decline,[34] a position for which she was fired without explanation from her university post[35] and pilloried by prominent scientists in the profession.[36] The International Union for Conservation of Nature ("IUCN") estimated the current polar bear

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rising oceans, and food shortages), https://www.un.org/en/climatechange/science/causes-effects-climate-change [https://perma.cc/5VND-3TZ6].

30. *See, e.g.*, Salazar, *supra* note 2 ("The climate crisis is fueled by the historic emissions of industrial countries and fossil fuel corporations, yet the impacts are borne most heavily by the nations and peoples who have contributed the least to this crisis.").

31. Schonhardt, *supra* note 1. *But see* Raymond Zhong, *A Surprising Climate Find*, N.Y. TIMES (June 27, 2024), https://www.nytimes.com/2024/06/27/briefing/maldives-atolls-climate-change.html (on file with the *Iowa Law Review*) ("As the planet warms and the oceans rise, atoll nations like . . . Tuvalu have seemed doomed to vanish, like the mythical Atlantis, into watery oblivion . . . . [But e]ven though sea levels have risen, many islands haven't shrunk. Most, in fact, have been stable. Some have even grown.").

32. *See* Lomborg, *supra* note 28.

33. *See* Juliet Eilperin, *Study Says Polar Bears Could Face Extinction*, WASH. POST (Nov. 9, 2004), https://www.washingtonpost.com/wp-dyn/articles/A35233-2004Nov8.html (on file with the *Iowa Law Review*).

34. *See* Susan J. Crockford, *About*, POLAR BEAR SCI., https://polarbearscience.com/about-2 [https://perma.cc/EEU7-QX24]; Susan J. Crockford, *Polar Bears in W. Hudson Bay Are in Good Shape, Says Researcher. So Are Numbers Really Falling?*, POLAR BEAR SCI. (May 13, 2023), https://polarbearscience.com/2023/05/13/polar-bears-in-w-hudson-bay-are-in-good-shape-says-researcher-so-are-numbers-really-falling [https://perma.cc/57KE-Z83B].

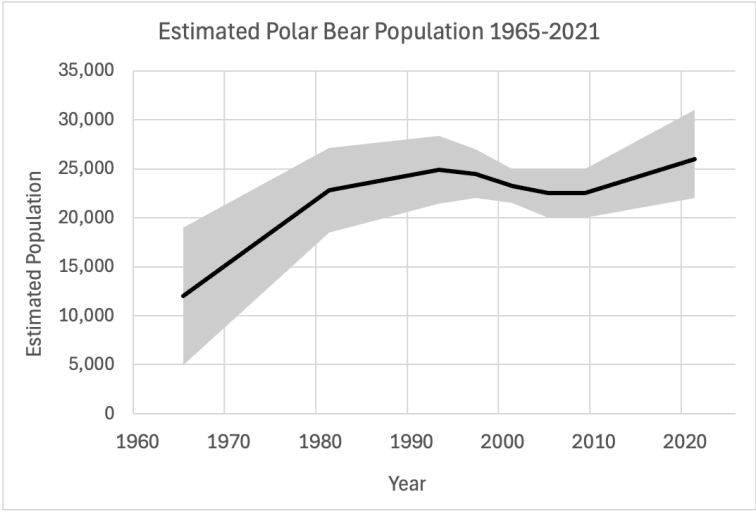
35. Valerie Richardson, *Susan Crockford Fired After Finding Polar Bears Thriving Despite Climate Change*, WASH. TIMES (Oct. 20, 2019), https://www.washingtontimes.com/news/2019/oct/20/susan-crockford-fired-after-finding-polar-bears-th (on file with the *Iowa Law Review*). "Lack of balance" was one of the charges against Crockford. *Id. But see* Jeffrey A. Harvey et al., *Internet Blogs, Polar Bears, and Climate-Change Denial by Proxy*, 68 BIOSCIENCE 281, 283–85 (2018).

36. *See* Erica Goode, *Climate Change Denialists Say Polar Bears Are Fine. Scientists Are Pushing Back.*, N.Y. TIMES (April 10, 2018), https://www.nytimes.com/2018/04/10/climate/polar-bears-climate-deniers.html (on file with the *Iowa Law Review*). "[R]esearchers also singled out Polar Bear Science, a blog run by Susan J. Crockford, a Canadian zoologist, as a primary source of dubious information about the status of polar bears." *Id.*

"The scientific evidence that the polar bear's Arctic home is warming twice as fast as the rest of the planet is overwhelming, supported by reports like the National Climate Assessment, which was compiled by 13 federal agencies. In some Arctic regions, scientists have documented declines in polar bear numbers and disturbing signs of physical deterioration linked to the loss of sea ice." *Id.*

population at some 26,000, only to issue an unsupported warning that the population could disappear.[37] The graph below is a composite of official estimates.[38]

Figure 1



The same multifaceted story applies to the coral reef. A highly publicized story in the New York Times commented on the latest official report from the Australian Institute of Marine Science on the status of the Great Barrier Reef with the ominous headline "Heat Raises Fear of 'Demise' for Great Barrier Reef Within a Generation," followed by testimony from climate scientists about the looming crisis.[39] A look at that report tells a much more nuanced story. Coral cover has increased in all three regions along the Great Barrier Reef, totaling some 1,500 miles, and is today at regional highs in two of the

37. *See* IUCN/SSC POLAR BEAR SPECIALIST GROUP, STATUS REPORT ON THE WORLD'S POLAR BEAR SUBPOPULATIONS 5 (July 2021) [hereinafter IUCN/SSC STATUS REPORT], https://www.iucn-pbsg.org/wp-content/uploads/2021/11/July-2021-Status-Report-Web.pdf [https://perma.cc/RRJ2-WZYU].

38. PROCEEDINGS OF THE FIRST INTERNATIONAL SCIENTIFIC MEETING ON THE POLAR BEAR 11 (1965); PROCEEDINGS OF THE EIGHTH WORKING MEETING OF THE IUCN/SSC POLAR BEAR SPECIALIST GROUP 39–41 (1981); IUCN/SSC STATUS REPORT, *supra* note 37, at 5.

39. Catrin Einhorn, *Heat Raises Fears of 'Demise' for Great Barrier Reef Within a Generation*, N.Y. TIMES (Aug. 7, 2024), https://www.nytimes.com/2024/08/07/climate/ocean-heat-great-barrier-reef.html (on file with the *Iowa Law Review*) ("This generation will probably see the demise of the Great Barrier Reef unless humanity acts with far more urgency to rein in climate change."); *see also* Graham Readfearn, *Hottest Ocean Temperatures in 400 Years an 'Existential Threat' to the Great Barrier Reef, Researchers Find*, GUARDIAN (Aug. 7, 2024 11:00 AM), https://www.theguardian.com/environment/article/2024/aug/08/great-barrier-reef-ocean-temperatures-hottest-record [https://perma.cc/3HSP-DCZC].

three regions.[40] That note of caution again refers to the climate change story reported in the New York Times and elsewhere, which in turn was backed up by an article in Nature that concluded that the frequent recent bleaching events were ominous:

> Climate model analysis confirms that human influence on the climate system is responsible for the rapid warming in recent decades. This attribution, together with the recent ocean temperature extremes, post-1900 warming trend and observed mass coral bleaching, shows that the existential threat to the [Great Barrier Reef] ecosystem from anthropogenic climate change is now realized.[41]

In fact, the evidence is much more complicated than this. The Nature article itself makes only one oblique reference to carbon dioxide.[42] Indeed, other forces can influence the operations here. It is well-known that natural bleaching, when the coral expels algae and turns white, can occur with temporary local temperature changes, but evidence from many years of scientific observation suggests the corals often and quickly recover.[43] Thus one report notes: "Since 1998, eight mass thermal CBEs [coral bleaching events] have occurred on the GBR [Great Barrier Reef], with five of them since 2016" and one during La Niña, which is "a climate state historically associated with increased cloud cover, rainfall and cooler summer water temperatures along the GBR."[44] Each of these instances was followed by a recovery, so that there is no reason to think that these cycles will not continue at irregular intervals regardless of other factors.[45] It is also instructive that this

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40. AUSTL. INST. OF MARINE SCI., ANNUAL SUMMARY REPORT OF THE GREAT BARRIER REEF CORAL REEF CONDITION 2023–2024, at 2 (2024), https://www.aims.gov.au/sites/default/files/2024-08/AIMS_LTMP_Report_GBR_coral_status_2023_2024_final.pdf [https://perma.cc/DX9N-MH7K].

41. Benjamin J. Henley et al., *Highest Ocean Heat in Four Centuries Places Great Barrier Reef in Danger*, 632 NATURE 320, 320 (2024).

42. *See id.* at 328.

43. *See, e.g.*, Chris Morrison, *Huge Increase in Coral Produces Third Year of Record Highs on the Great Barrier Reef*, DAILY SCEPTIC (Aug. 9, 2024), https://dailysceptic.org/2024/08/09/huge-increase-in-coral-produces-third-year-of-record-highs-on-the-great-barrier-reef [https://perma.cc/Y6J5-RKZR]; Mike Emslie, Daniela Ceccarelli & David Wachenfeld, *Is the Great Barrier Reef Reviving – or Dying? Here's What's Happening Beyond the Headlines*, AUSTL. INST. MARINE SCI. (Aug. 10, 2023), https://www.aims.gov.au/information-centre/news-and-stories/great-barrier-reef-reviving-or-dying-heres-whats-happening-beyond-headlines [https://perma.cc/RAR2-K8ZT] ("The Reef has shown an impressive ability to recover from widespread disturbances, when it gets a chance – it's not all just bleaching and death. But it's also true we're heading towards a future where hotter water temperatures will likely cause bleaching every year.").

44. Lara Shania Richards et al., *The Meteorological Drivers of Mass Coral Bleaching on the Central Great Barrier Reef During the 2022 La Niña*, SCI. REPS. (Oct. 12, 2024), https://www.nature.com/articles/s41598-024-74181-2 [https://perma.cc/D4CN-3J2E].

45. *See, e.g.*, *Coral Recovery After Bleaching Event in the Central Pacific*, NOAA FISHERIES (June 8, 2022), https://www.fisheries.noaa.gov/feature-story/coral-recovery-after-bleaching-event-central-pacific [https://perma.cc/KK26-55A2]; *NOAA Confirms 4th Global Coral Bleaching Event*, NAT'L

article in the New York Times does not once mention carbon dioxide, which means that even any overall change in temperature gradient cannot be attributed to the use of fossil fuels.[46] Nor is there any discussion of what counts as the optimal temperature for coral growth.[47] Thus, it is especially instructive that one detailed account of how an "aquarist," i.e., one who builds a coral reef aquarium, posits the ideal conditions for coral growth.[48] Among its other parameters, one aquarist stresses that temperature should range between seventy-six to eighty-three degrees Fahrenheit, a wide range whose values, as the aquarist notes, will vary in natural settings.[49] But that range is large enough so that no small perturbation in temperature is likely be decisive, especially since the ideal environment has at least ten other parameters that have to be controlled, including calcium alkalinity, salinity, pH, magnesium, phosphate, and ammonia.[50]

As should be evident from even this brief review of the subject, too often the first impulse is to look for global explanations tied to the incremental increases in carbon dioxide, while ignoring natural variations from other sources ranging from local diseases, to overfishing, to construction projects, sunspot cycles, and even human pollution, such as suntan lotion that can cover corals.[51] The same story can be told by looking at the high annual variation in insurable losses for natural disasters, which cannot explain slow and uniform increases in carbon dioxide levels.[52] As I wrote years ago, the tragic forest fires in California have depended far more on bad management practices than any temperature changes.[53]

OCEANIC & ATMOSPHERIC ADMIN. (Apr. 15, 2024), https://www.noaa.gov/news-release/noaa-confirms-4th-global-coral-bleaching-event [https://perma.cc/TB2Y-YZZS] (picturing a "three-panel image [that] shows a boulder star coral in St. Croix, USVI, as it shifted from healthy (May 2023), to bleached (October 2023), to recovered (March 2024), following extreme marine heat stress throughout the Caribbean basin in 2023").

46. *Contra* Einhorn, *supra* note 39.

47. *Contra id.*

48. *See* Randy Holmes-Farley, *Optimal Parameters for a Coral Reef Aquarium*, REEF2REEF (Sept. 19, 2014), https://www.reef2reef.com/threads/optimal-parameters-for-a-coral-reef-aquarium-by-randy-holmes-farley.173563 [https://perma.cc/5368-33HW].

49. *See id.*

50. *See id.*

51. *See, e.g.*, Djordje Vuckovic et al., *Conversion of Oxybenzone Sunscreen to Phototoxic Glucoside Conjugates by Sea Anemones and Corals*, 376 SCIENCE 644 (2022).

52. Statista Research Department, *Insured Losses Caused by Natural Disasters Worldwide from 1970 to 2021*, STATISTA (Nov. 1, 2024), https://www.statista.com/statistics/281052/insured-losses-from-natural-disasters-worldwide [https://perma.cc/T2Z2-G9CN] ("The worst years for global insured losses from natural disasters were 2005, 2011, and 2017." The variations range in no particular order from $17 billion to $154 billion.)

53. Richard A. Epstein, *California's Forest Fire Tragedy*, HOOVER INST. (Nov. 19, 2018), https://www.hoover.org/research/californias-forest-fire-tragedy [https://perma.cc/6QVY-386Z] ("Local variables have transformed California far more dramatically than climate change. Thanks to a large influx of new residents to California in recent years, new homes have been built close to the forests, as happened in the now torched town of Paradise, where the many new homes burnt to

Backing of all these stories is, of course, a confident theoretical story of how greenhouse gases ("GHGs") most prominently drive the overall analysis. But that account, too, has been questioned in ways to which the orthodox view has not provided a coherent account.[54] And if the theory is as questionable as this evidence, the massive case for global reparations collapses.

II. THEORETICAL FOUNDATIONS FOR GLOBAL WARMING

It is orthodox science to attribute this wide variety of human ills to carbon dioxide, which is said to result in a greenhouse gas effect that traps heat in the atmosphere, producing higher temperature levels from which massive physical and social dislocations follow.[55] Of human dislocations, there is no dispute, but that point is often made in dramatic form by groups, like the United Nations, that offer no connection to carbon dioxide levels. Nonetheless, it has often been asserted, as in a recent open letter that concludes there is ninety-nine percent consensus that human activities are responsible for climate change.[56] But note the caveats. Human activities are broad indeed, and the title does not single out carbon dioxide from other GHGs that can influence global changes; nor does it offer a quantitative estimate of the size of the impact on global temperatures, which at no point it calls a crisis. And the ninety-nine percent consensus has to be too high. An

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the ground were quite literally in harm's way."); *see also Addressing the Resilient Federal Forests Act Congressman Tom McClintock Says "We Are Running Out of Forests to Save"*, SIERRA SUN TIMES (Oct. 6, 2017, 5:06 PM), https://goldrushcam.com/sierrasuntimes/index.php/news/local-news/11451-addressing-the-resilient-federal-forests-act-congressman-tom-mcclintock-says-we-are-running-out-of-forests-to-save (on file with the *Iowa Law Review*) ("Timber that once had room to grow healthy and strong now fights for its life against other trees trying to occupy the same ground. Average tree density in the Sierra Nevada is three to four times the density the land can support. In this weakened condition, trees lose their natural defenses to drought, disease, pestilence, and ultimately succumb to catastrophic wildfire. Three years ago, an estimated [twenty-five] million trees in the Sierra fell victim to these stressors. Two years ago, that number doubled to over [fifty] million trees. Last year, an estimated [one-hundred] million dead trees are waiting to burn.").

54. *See, e.g.*, James T. Moodey, *Carbon Dioxide Does Not Cause Global Warming*, WASH. TIMES (July 12, 2023), https://www.washingtontimes.com/news/2023/jul/12/carbon-dioxide-doesnt-cause-climate-change (on file with the *Iowa Law Review*).

55. *See, e.g.*, *Climate Change and Displacement*, UNITED NATIONS HIGH COMM'R FOR REFUGEES, https://www.unhcr.org/what-we-do/build-better-futures/climate-change-and-displacement [https://perma.cc/X9W2-7KEG]. But this claim never identifies carbon dioxide as the source of the climate change or explains why the difficulties are greater today when basic levels of human subsistence are higher today that earlier. For the demonstration, see generally JOHAN NORBERG, PROGRESS: TEN REASONS TO LOOK FORWARD TO THE FUTURE (2017), that points out dramatic changes in food, sanitation, life expectancy, poverty, violence, the environment, literacy, freedom equality, and the next generation.

56. Mark Lynas, Benjamin Z. Houlton & Simon Perry, *Greater than 99% Consensus on Human Caused Climate Change in the Peer-Reviewed Scientific Literature*, ENV'T. RSCH. LETTERS, Oct. 2021, at 1, 4 ("Our analysis demonstrates [greater than ninety-nine percent] agreement in the peer-reviewed scientific literature on the principal role of greenhouse gas (GHG) emissions from human activities in driving modern climate change (i.e. since the Industrial Revolution).").

avowedly skeptical Climate Intelligence Foundation ("CLINTEL")[57] site lists some 1,900 scientists and professionals who declare: "Climate science should be less political, while climate policies should be more scientific. Scientists should openly address uncertainties and exaggerations in their predictions of global warming, while politicians should dispassionately count the real costs as well as the imagined benefits of their policy measures."[58]

CLINTEL then recounts a list of its well-rehearsed objections: the role of natural factors, the low rate of temperature increases, the questionable modeling techniques, the essential role of carbon dioxide in food production, the want of any established correlation of temperature changes with natural disasters, and the large costs of implementing climate policies.[59] Overall, the poor record of prediction with oversimplified doomsday hypothesis, noted above, should make us wary of these one-dimensional answers, and we should take a closer look at the counterarguments to the dominant trope, which lend support to the skeptical position on climate change.[60]

The first technical question raised in this debate concerns the role of the GHG barrier that both traps heat inside the atmosphere and simultaneously keeps heat from the sun from entering the atmosphere.[61] These two forces operate in opposition to each other, but they are not of equal magnitude.[62] The rays from outside operate at different frequencies and thus are able to make it through the GHG barrier more easily than the radiation that is reflected up from the earth.[63]

> Oxygen and nitrogen don't interfere with infrared waves in the atmosphere. That's because molecules are picky about the range of wavelengths that they interact with, [climate expert Jason] Smerdon

57. *See generally Climate Intelligence Foundation (CLINTEL)*, DESMOG, https://www.desmog.com/climate-intelligence-foundation-clintel [https://perma.cc/MYH3-BDY9] (providing background information on CLINTEL).

58. *There Is No Climate Emergency*, CLINTEL, https://clintel.org/world-climate-declaration [https://perma.cc/RCN6-C4LT].

59. *Id.*

60. *Id. But see CLINTEL Group Inaccurately Represents Climate Science in Its Declaration of "No Climate Emergency" Once Again*, SCI. FEEDBACK (Sept. 4, 2023), https://science.feedback.org/review/clintel-group-inaccurately-represents-climate-science-declaration-no-climate-emergency-once-again [https://perma.cc/E94F-5MPJ] (arguing that "all potential causes of climate change" are the result of "human activity").

61. *See, e.g.*, Melissa Denchak, *Greenhouse Effect 101*, NRDC (June 5, 2023), https://www.nrdc.org/stories/greenhouse-effect-101 [https://perma.cc/3ZJ5-ZXQ8] (indicating that "Earth's greenhouse gases trap heat in the atmosphere and warm the planet" and that "today's warming . . . is occurring at a pace that can't be explained by natural causes alone").

62. *See id.* ("While around 30 percent of the solar energy–the light and heat from the sun–that reaches our world is reflected back into space, the rest is either absorbed by the atmosphere or the earth's surface . . . [which] warms the planet.").

63. *See id.* ("This heat is then radiated back up in the form of invisible infrared radiation. While some of this infrared light continues on into space, the vast majority gets absorbed by atmospheric gases, known as greenhouse gases, causing further warming.").

> explained. For example, oxygen and nitrogen absorb energy that has tightly packed wavelengths of around 200 nanometers or less, whereas infrared energy travels at wider and lazier wavelengths of 700 to 1,000,000 nanometers. Those ranges don't overlap, so to oxygen and nitrogen, it's as if the infrared waves don't even exist; they let the waves (and heat) pass freely through the atmosphere. [64]

The exact amount of the difference is hard to measure, and it may well depend on the level of GHGs. But GHGs cannot be the entire story, for if it were, then the accumulated trapped heat would continue to rise without limits, which has never been the case, so that some other forces have to balance this tendency out.[65] So this imperfect filter cannot be the complete explanation. We know that temperatures cannot rise without end, so the question for reparations turns on a battle over the differential effects between 1.5 degrees centigrade and 2.0 degrees centigrade, which is regarded by many individuals as a huge divide.[66] Indeed, climate activist Bill McKibben (a journalist, not a scientist) has insisted that 350 parts per million ("ppm") is a tipping point.[67] But there is no discrete turning point.[68] Neither that number nor any other is able to explain the huge fluctuations in temperature on the earth's surface, including the dramatic movement of the Scandinavian Ice Sheet, whose dramatic rise and fall could not be attributed to carbon dioxide levels.[69]

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64. Sarah Fecht, *How Exactly Does Carbon Dioxide Cause Global Warming?*, COLUM. CLIMATE SCH. (Feb. 25, 2021), https://news.climate.columbia.edu/2021/02/25/carbon-dioxide-cause-global-warming [https://perma.cc/3KWB-8U8F].

65. *See Causes of Climate Change*, EPA (Mar. 25, 2025), https://www.epa.gov/climatechange-science/causes-climate-change [https://perma.cc/BC5D-LAFA] (enumerating all causes of climate change, such as "[v]olcanic [a]ctivity" and "[c]hanges in the Earth's [r]eflectivity" and stating that "recent climate changes cannot be explained by natural causes alone").

66. Sean Fleming, *What's the Difference Between 1.5 and 2 Degrees of Global Warming?*, WORLD ECON. F. (July 28, 2021), https://www.weforum.org/stories/2021/07/2c-global-warming-difference-explained [https://perma.cc/37GX-ZEL9] (claiming that this difference "could mean many millions more people are subjected to life-threatening climate events"). This difference cannot be the entire explanation given the huge possible range of temperatures. No evidence is offered for any sharp discontinuity, let alone here.

67. *See* Corydon Ireland, *Climate Change Is Too Late to Stop, but It's Not Too Late to Act*, HARV. GAZETTE (Oct. 19, 2009), https://news.harvard.edu/gazette/story/2009/10/mckibben-brings-350-home [https://perma.cc/W5ST-D4K8] (stating that "McKibben's message is that the Earth is warming rapidly" and acting to reduce the effect of climate change "means getting humankind . . . back to 350 parts per million of atmospheric carbon dioxide").

68. *See, e.g.*, Mike Peña, *Global Warming Is Happening, but Not Statistically 'Surging,' New Study Finds*, UC SANTA CRUZ (Oct. 14, 2024), https://news.ucsc.edu/2024/10/global-warming-statistics.html [https://perma.cc/Z2K7-3FJC] (study finding that even though "[r]ecent years have seen record-breaking temperatures and heat waves globally" these temperatures "could [not] be defined as a surge").

69. *See, e.g.*, Gustav Jungdal-Olesen, Jane Lund Andersen, Andreas Born & Vivi Katherine Pedersen, *The Influence of Glacial Landscape Evolution on Scandinavian Ice-Sheet Dynamics and Dimensions*, 18 CRYOSPHERE 1517, 1517 (2024) (finding that "the pace of [the Scandinavian Ice Sheet's] glacial cycles result[ed] from solar insulation variations combined with feedback

> []The Pleistocene Epoch began about 2,600,000 years ago and ended about 11,700 years ago.[] At its maximum extent, the Scandinavian Ice Sheet nearly reached latitude 48° N. It is estimated to have covered about 6,600,000 square km (2,500,000 square miles) and attained a thickness of up to 9,800 feet (3000 metres).[70]

Notwithstanding these massive climate variations, it is too common to look instead to short-term changes in carbon dioxide levels as the short-term cause of temperature variation, and thus to treat all the increase in temperatures as a result of one variable—carbon dioxide. It is, as I have argued years ago, a theory of climate change that has only one key variable, the level of carbon dioxide, pushing everything from water vapor, to La Niña, to sunspots, to volcanoes.[71] No complex system has that kind of single-peaked dominance.

It becomes painfully clear that these small-scale variations in temperature cannot be explained by the static greenhouse effects. Therefore other, or at least additional, explanations are needed for the various cycles in temperatures and precipitation that are the fixed features of nature—remember if all temperatures rose or fell only monotonically then we should all fry or freeze.[72] Yet the moment that long term stability is understood, it becomes difficult to figure out what the cycles are that determine global temperature moves. The basic form for these variations may well be a regular sine wave, but the actual patterns are sufficiently disjoint that it seems clear that there are several such forces at play, each cycle with different heights and lengths. Or as it has been said:

> Besides being more important as a greenhouse gas, water vapour has another big difference from CO2: the fact that its quantity in the atmosphere varies substantially in time and in space, thus being an agent of perpetual change on all time scales. The change on fine time scales (e.g. hourly to daily) is easy to comprehend, but change also occurs on annual, decadal and centennial scales, and beyond. The understanding of the latter was pioneered by Hurst (1951), and more recent studies confirm that the long-term change (also called

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mechanisms and internal dynamic effects in the climate system, in part caused by the ice sheets themselves" (citation omitted)).

70. *Scandinavian Ice Sheet*, BRITANNICA, https://www.britannica.com/place/Scandinavian-Ice-Sheet [https://perma.cc/JR6S-CXDR] ("[The] Scandinavian Ice Sheet, [is] one of the largest Pleistocene glacial masses, covering most of northern Europe.").

71. *See* Richard A. Epstein, *Carbon Dioxide: Our Newest Pollutant*, 43 SUFFOLK U. L. REV. 797, 804–09 (2010) (deeply skeptical of singular causal explanations).

72. *See NASA Study Reveals Compounding Climate Risks at Two Degrees of Warming*, NASA (Aug. 14, 2023), https://climate.nasa.gov/news/3278/nasa-study-reveals-compounding-climate-risks-at-two-degrees-of-warming [https://perma.cc/3UA3-RRV2] (providing that a 3.6 degree increase in global temperatures would increase "severe heat stress" and "extreme fire weather").

> Hurst-Kolmogorov behaviour) occurs in all processes related to water and the atmosphere.[73]

Some models do not account for the fact that "the greenhouse effect caused by increasing greenhouse gases and water vapor (as a feedback)" could be balanced or "offset by increased low-level cloud cover as a negative cloud feedback."[74] Thus, sometimes these independent cycles reinforce, at which point there can be dramatic effects, or alternatively they cancel out, at which point there is a period of relative stability. But implicit in this argument is a caution to be aware of what the methodological error is, to look at some short time span in which the movements appear strong in one direction or the other, and to forget the larger cyclical framework in which these movements take place.

Thus, one cyclical explanation, associated with the work of recent Nobelist John Clauser[75] starts with the observation that the want of cloud cover results in higher temperatures that in turn lead to higher rates of evaporation, which then forms cloud cover.[76] That cloud cover in turn moderates temperatures, which in turn results in lower evaporation, which then leads to fewer clouds and a return to higher temperatures, and so the cycles can continue.[77] One recent paper makes just this conclusion:

> The observed increase of the atmospheric CO_2 concentration . . . has not altered, in a discernible manner, the greenhouse effect, which remains dominated by the quantity of water vapour in the atmosphere . . . [and] [t]he original formulae used in hydrological practice . . . remain valid, and they do not need adaptation due to increased CO_2 concentration.[78]

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73. Demetris Koutsoyiannis & Christos Vournas, *Revisiting the Greenhouse Effect – A Hydrological Perspective*, 69 HYDROLOGICAL SCIS. J. 151, 151 (2024) (citations omitted).

74. Kevin E. Trenberth & John T. Fasullo, *Global Warming Due to Increasing Absorbed Solar Radiation*, GEOPHYSICAL RSCH. LETTERS 4 (Apr. 14, 2009), https://doi.org/10.1029/2009GL037527 (on file with the *Iowa Law Review*).

75. John Clauser shared the Nobel in Physics last year. Now, he's a self-described "denier" of the overwhelming scientific consensus on a warming planet. Maxine Joselow, *He Won a Nobel Prize. Then He Started Denying Climate Change*, WASH. POST (Nov. 16, 2023), https://www.washingtonpost.com/politics/2023/11/16/he-won-nobel-prize-then-he-started-denying-climate-change (on file with the *Iowa Law Review*). But here is the fly in the ointment, key articles show dirty coal emissions from Chinese plants and rely on the doomsday IPCC Report. *See* Sarah Kaplan, *World Is on Brink of Catastrophic Warming, U.N. Climate Change Report Says*, WASH. POST (Mar. 20, 2023), https://www.washingtonpost.com/climate-environment/2023/03/20/climate-change-ipcc-report-15 (on file with the *Iowa Law* Review) (discussing the IPCC Report and including a photograph of a Chinese coal-fired power plant).

76. *See* Joselow, *supra* note 75 ("Clauser, who has never published a peer-reviewed paper on climate change, has homed in on one message in particular: The Earth's temperature is primarily determined by cloud cover, not carbon dioxide emissions from burning fossil fuels.").

77. *See id.*

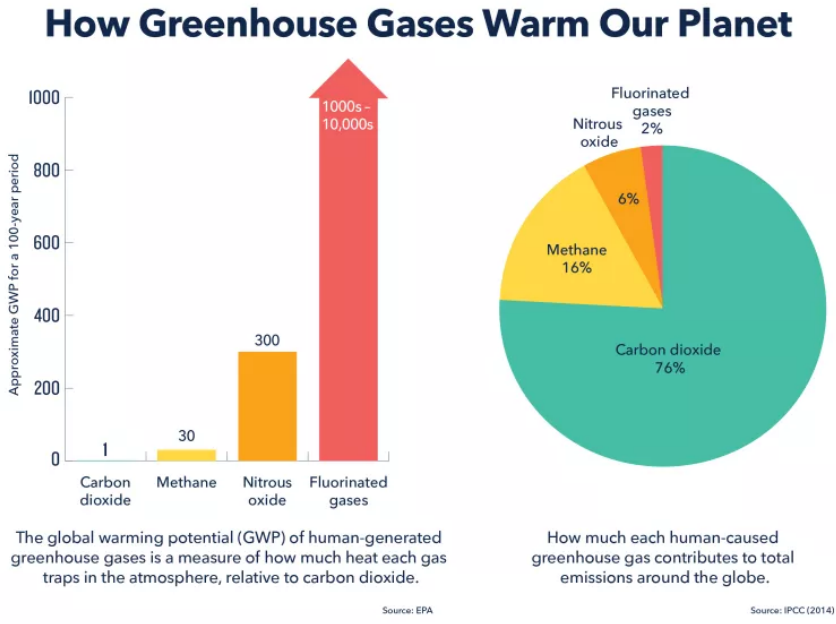
78. Koutsoyiannis & Vournas, *supra* note 74, at 159 (citations omitted).

It is against this backdrop that it is critical to examine the claim of the National Resources Defense Council ("NRDC") suggesting that higher concentrations of greenhouse gases, and carbon dioxide ("CO_2") in particular, are causing extra heat to be trapped and average global temperatures to rise.[79] Water vapor is of course a GHG, but to the NRDC, it does not count as a dominant independent variable, but solely exerts a derivative effect:

> The most abundant greenhouse gas overall, water vapor differs from other greenhouse gases in that changes in its atmospheric concentrations are linked not to human activities directly, but rather to the warming that results from the other greenhouse gases we emit. Warmer air holds more water. And since water vapor is a greenhouse gas, more water absorbs more heat, inducing even greater warming and perpetuating a positive feedback loop.[80]

It then proceeds to remove water vapor from the picture:[81]

Figure 2



79. *See* Denchak, *supra* note 61.

80. *Id.* Smerdon agrees. *See also* Fecht, *supra* note 64 ("Water is indeed a greenhouse gas. It absorbs and re-emits infrared radiation, and thus makes the planet warmer. However, Smerdon says the amount of water vapor in the atmosphere is a consequence of warming rather than a driving force, because warmer air holds more water.").

81. Denchak, *supra* note 61 (using the reproduced graph to identify how greenhouse gases warm the planet).

The NRDC does not cite the authority for its dismissal of the role of water vapor, but one key paper treats atmospheric CO2 as the "Principal Control Knob Governing Earth's Temperature."[82] Its argument is that only GHGs are constant elements in the environment—in contrast to water vapor that comes and goes—which means that water vapor could not provide the constant protection needed to prevent the earth from becoming an icy graveyard.[83] But its entire discussion predicts total collapse if GHGs are driven to zero,[84] which is surely true. However, the relevant question here does not ask the consequences of removing all water vapor or all GHGs from the atmosphere. It is a more prosaic task of trying to make predictions of the effects of relatively tiny changes in both GHGs when water vapor is at its most visible point in time, which makes it indefensible for the NRDC to exclude it from all key marginal determinations.

Against this background, branding carbon dioxide a "pollutant" is the artifice of a legal system bending under political pressures,[85] when that gas is, as everyone who addresses this issue accepts, essential to life.[86] The charge that carbon dioxide is a pollutant therefore must be taken with at least one major qualification; namely, that there has to be some mechanism that explains when that gas turns from friend to foe. This cannot be 350 ppm—a point reached in the mid-1980s[87]—given the well-recorded shifts in temperature between the medieval warming period that ran roughly from 900 to 1300,[88] and the Little Ice Age that ran roughly from the fourteenth to the nineteenth century.[89] Neither of these periods is tidy, and there is much dispute about

82. *See, e.g.*, Andrew A. Lacis, Gavin A. Schmidt, David Rind & Reto A. Ruedy, *Atmospheric CO_2: Principal Control Knob Governing Earth's Temperature*, 330 SCIENCE 356, 356 (2010).

83. *Id.* at 357 (explaining how GHGs are essential to maintaining atmospheric temperatures that prevent Earth from "plunging . . . to an icebound state").

84. *Id.* ("[T]he terrestrial greenhouse effect would collapse were it not for the presence of these noncondensing GHGs.").

85. For example, see Massachusetts v. EPA, 549 U.S. 497, 528–29 (2007), which stretched the definition of pollutant to force the U.S. Environmental Protection Agency to regulate carbon dioxide emissions. "The Act defines 'air pollutant' to include 'any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters the ambient air.'" *Id.* at 506 (omission in original). The definition begs every serious question. *Id.* at 529 ("The definition embraces all airborne compounds . . . .").

86. *See, e.g.*, *DOE Explains…the Carbon Cycle*, U.S. DEP'T ENERGY, https://www.energy.gov/science/doe-explainsthe-carbon-cycle [https://perma.cc/BE99-643U] ("[C]arbon makes life on Earth possible.").

87. *See* Rebecca Lindsey, *Climate Change: Atmospheric Carbon Dioxide*, CLIMATE.GOV (Apr. 9, 2024), https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide [https://perma.cc/MJ42-V7EL]. *But see Why 350?*, MN350 (2025), https://mn350.org/understanding350 [https://perma.cc/AXH2-2R7E] ("Countless scientists, climate experts, and governments officials agree that 350 ppm is the 'safe' level of carbon dioxide.").

88. John P. Rafferty, *Medieval Warm Period*, BRITANNICA, https://www.britannica.com/science/medieval-warm-period [https://perma.cc/GF55-FFD3].

89. Stephen T. Jackson & John P. Rafferty, *Little Ice Age*, BRITANNICA (Feb. 1, 2025), https://www.britannica.com/science/Little-Ice-Age [https://perma.cc/WBV6-QKPP].

the intensity of the changes, local and temporal variations, and, of course, carbon dioxide levels.[90] But ample sociological evidence confirms the scope of these changes.[91] Without one simple explanation, it becomes all the more likely that some forces apart from carbon dioxide play a major role. On this view, Michael Mann's hockey stick model[92] is questionable insofar as it places all the rise in temperatures after 1800, while ignoring these earlier cyclical variations. In particular, human GHG emissions in the early part of the modern period—when the hockey stick graph fails to tie those early temperature rises to GHGs—were low.[93] The better way to model these changes is in terms of increased probabilities of some change, subject to the caveat that doubling the concentration of GHGs does not double the risk of harm from temperature increases.[94] As professors Will Happer and Richard Lindzen explain: "The physics of carbon dioxide is that CO2's ability to warm the planet is determined by its ability to absorb heat, which decreases rapidly as CO2's concentration in the atmosphere increases."[95]

The same is not true, however, when the question turns to a second effect from the increase in carbon dioxide levels: photosynthesis.[96] Given the sheer amount of plant life, it seems trivial to assert that the mechanisms of plant growth have to be simple and powerful. The two major ingredients, carbon

90. *Compare* Alexander Koch, Chris Brierley, Mark M. Maslin & Simon L. Lewis, *Earth System Impacts of the European Arrival and Great Dying in the Americas After 1492*, 207 QUARTERNARY SCI. REVS. 13, 14 (2019) (hypothesizing how human actions—the arrival of Europeans in the Americas and subsequent death of Native American populations—reduced atmospheric CO_2 levels), *with* M. Rubino et al., *Low Atmospheric CO_2 Levels During the Little Ice Age Due to Cooling-Induced Terrestrial Uptake*, 9 NATURE GEOSCI. 691, 693 (2016) (claiming atmospheric CO_2 levels fell during the Little Ice Age because plants absorbed more carbon in response to lower temperatures).

91. *See, e.g.*, Maria Waldinger, *The Economic Effects of Long-Term Climate Change: Evidence from the Little Ice Age*, 130 J. POL. ECON. 2275, 2299 (2022) ("[T]he Little Ice Age decreased city size through its effect on agricultural productivity, morality, and possibly migration.").

92. *See* MICHAEL E. MANN, THE HOCKEY STICK AND THE CLIMATE WARS, at xix–xx (2012); Michael E. Mann, *Beyond the Hockey Stick: Climate Lessons from the Common Era*, PROC. NAT'L ACAD. SCIS. 7 (Sept. 24, 2021), https://www.pnas.org/doi/epub/10.1073/pnas.2112797118 [https://perma.cc/K4Y5-GUZG].

93. Leandro Vigna, Johannes Friedrich & Thomas Damassa, *The History of Carbon Dioxide Emissions*, WORLD RES. INST. (June 3, 2024), https://www.wri.org/insights/history-carbon-dioxide-emissions [https://perma.cc/39XX-YFC6].

94. *Cf.* Marcin Popkiewicz, *If Growth of CO2 Concentration Causes Only Logarithmic Temperature Increase – Why Worry?*, SKEPTICAL SCI. (Apr. 15, 2014), https://skepticalscience.com/co2-emissions-vs-temperature-growth.html [https://perma.cc/CG2K-ZPL6] ("It is true, that for each doubling of CO_2 concentration, temperature increases by a constant value.").

95. Richard Lindzen & William Happer, *Net Zero Policies Will Have a Trivial Effect on Temperature, but Disastrous Effects on People Worldwide*, CO_2 COAL. (July 19, 2024), https://co2coalition.org/publications/net-zero-policies-will-have-a-trivial-effect-on-temperature-but-disastrous-effects-on-people-worldwide [https://perma.cc/K2EN-42MM].

96. For a simple thumbnail sketch, see Hans Lambers & James Alan Bassham, *Photosynthesis*, BRITANNICA (Feb. 10, 2025), https://www.britannica.com/science/photosynthesis [https://perma.cc/4GXC-BSH7].

dioxide and water vapor, are both GHGs.[97] They are available in relative abundance in the atmosphere, with oxygen present at about twenty-one percent and carbon dioxide far less at about .042%, but critical nonetheless.[98] They combine in the presence of light to form the chemicals needed to sustain plant life and, thus, ultimately, all life.[99] At this point, the system of explanatory variables is closed, which leads to the powerful connection between higher levels of carbon dioxide and, by way of example, the considerable growth of Eldarica (Afghan) pine trees as carbon dioxide levels increase from 385 ppm to 535 ppm to 685 ppm to 835 ppm.[100]

There is a uniform increase in growth across this range at levels of carbon dioxide concentrations to the point where they are about twice what they are today, with no evidence of any collateral adverse effects.[101] That plant growth translates into positive social effects. More robust plant life covering a larger portion of the earth, coupled with reduction of temperature extremes, makes the earth a more habitable place. The question then arises as to how the variations in views should influence the widespread claim for climate reparations, which is undermined by the inability to establish any firm connection between carbon dioxide levels and a major rise in temperature or other negative effects.

III. THE SHAKY CASE FOR CLIMATE REPARATIONS

The attitude that is taken toward climate reparations is, in part, based on the view that one takes towards GHGs. Indeed, there is this strong connection. Anyone who thinks that the case of GHGs is overblown, will decry the case for reparations for the same reason they will reject demands for zero-based carbon emissions as a climate disaster, which exposes vulnerable populations to far greater risks.[102] It goes without saying that the defenders of the current model of GHGs and climate change claim to rely on the apparent consensus

97. *See id.*; Aaron Krol, *Why Do We Blame Climate Change on Carbon Dioxide, When Water Vapor Is a Much More Common Greenhouse Gas?*, MIT CLIMATE PORTAL (Nov. 3, 2023), https://climate.mit.edu/ask-mit/why-do-we-blame-climate-change-carbon-dioxide-when-water-vapor-much-more-common-greenhouse [https://perma.cc/AS9E-8R5X].

98. *The Atmosphere*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (July 2, 2024), https://www.noaa.gov/jetstream/atmosphere [https://perma.cc/87UB-E7FS].

99. *See* Lambers & Bassham, *supra* note 96.

100. *See* Richard Lindzen, William Happer & Steven Koonin, Fossil Fuels and Greenhouse Gases (GHGs) Climate Science 2 (Apr. 2024) (unpublished manuscript), https://co2coalition.org/wp-content/uploads/2024/04/Lindzen-Happer-Koonin-climate-science-4-24.pdf [https://perma.cc/88VK-K8EZ].

101. *Id.* at 2. *But see Effects of Changing the Carbon Cycle*, NASA EARTH OBSERVATORY (Jun. 16, 2011), https://earthobservatory.nasa.gov/features/CarbonCycle/page5.php [https://perma.cc/M7AU-L7SL] (discussing how increased carbon dioxide concentration raises the global temperature, and increases the acidity of the oceans, which in turn affects marine organisms; this "increases plant growth until the plant reaches a limit in the amount of water or nitrogen available," and causes warmer temperatures, which in turn stress plants, and thaws permafrost).

102. Lindzen, Happer & Koonin, *supra* note 100.

view of physicists, but not of hydrologists.[103] Yet when it comes to the legal inferences of the question of reparation for "loss and damage," now lawyers have a comparative advantage, which shows how dangerous it is to apply exotic legal theories to a body of disputed data.

To see why, it is useful to begin with the well-known Supreme Court case of *City of Milwaukee v. Illinois*,[104] which involved the emissions of untreated sewage from Milwaukee that made its way to the Illinois side of Lake Michigan. That case depends on a large body of public nuisance law that starts from the simple premise that emitting conventional pollution is a wrong that should be redressed either by a private party whose land or waters are polluted, or by a government who plays the same role for the pollution of public waters.[105] By this standard, it is harder to imagine an easier case for liability than this one, where Illinois acts as a representative for its many citizens who have been harmed. Now, a damage award could compensate for the past harms when coupled with an injunction against further emissions to stop the harm in its tracks, supplemented perhaps by a damage payment for future minor harms that are too difficult to prevent without serious disruption to Milwaukee's own sewage plant operation.[106] Nonetheless, the case came out the other way on the grounds that a federal statute, in this instance the Federal Water Pollution Control Act Amendments of 1972,[107] occupied the field so that courts in this interstate dispute could not impose common law damages, let alone an injunction to stop the pollution.[108] My view was and is that the regulatory scheme

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103. *See supra* note 96 and accompanying text.

104. *See generally* City of Milwaukee v. Illinois, 451 U.S. 304 (1981). For my criticism of that case, see generally Richard A. Epstein, *Federal Preemption, and Federal Common Law, in Nuisance Cases*, 102 NW. U. L. REV. 551 (2008).

105. *See, e.g.*, RESTATEMENT (SECOND) OF TORTS § 821B(1) (AM. L. INST. 1979) ("A public nuisance is an unreasonable interference with a right common to the general public."). The burgeoning literature defies summary. For my early effort to treat the problem with references to the literature, see Richard A. Epstein, *Nuisance Law: Corrective Justice and Its Utilitarian Constraints*, 8 J. LEGAL STUD. 49, 98–102 (1979). My more recent effort, with multiple references, is Richard A. Epstein, *The Private Law Connections to Public Nuisance Law: Some Realism About Today's Intellectual Nominalism*, 17 J.L. ECON. & POL'Y 282, 285 (2022), which took issue with Thomas W. Merrill, *Public Nuisance as Risk Regulation*, 17 J.L. ECON. & POL'Y 347 (2022), claiming public nuisance is not a tort but rather a public action to regulate prospective harms.

106. *See generally* Richard A. Epstein, *Positive and Negative Externalities in Real Estate Development*, 102 MINN. L. REV. 1493 (2018).

107. For a recitation of these disclaimers, see *Bd. of Cnty. Comm'rs v. Suncor Energy (U.S.A.), Inc.*, No. 2018CV30349, 2024 WL 3204275, at *21, *35 (D. Colo. June 21, 2024) ("Here, the Local Governments' claims do not seek to regulate or enjoin GHG emissions. . . . The Local Governments have alleged that the Energy Companies' actions have caused serious harm to public health and property, while they have earned hundreds of billions of dollars in profits by contributing to the harm. . . . Additionally, they have alleged that the Energy Companies benefited from concealing the dangers of fossil fuel consumption from the public." (citation omitted)).

108. See, *City of Milwaukee*, 451 U.S. at 317: "We conclude that, at least so far as concerns the claims of respondents, Congress has not left the formulation of appropriate federal standards to the courts through application of often vague and indeterminate nuisance concepts and maxims

could well block the use of an injunction that operated at cross-purposes with the statute, which in fact supplied its own remedy.[109]

At this point, the lesson to be learned is that the identification of a basic wrong does not necessarily lead to a clear choice of the proper remedy, over which there can be much dispute in domestic as well as foreign cases. Indeed, right now there is in the United States a huge dispute between different courts over whether claims of global warming can be remedied by states on their own motion,[110] or are preempted by federal actions.[111] The difficulties with these global warming cases transcend these jurisdictional battles' limitations, because there is no clear sense whatsoever of a public nuisance, parallel to that in *Milwaukee*, that requires any redress at all in any domestic tribunal.[112] Consider some of the relevant differences.

First, as a general matter, it is necessary in the global warming context to demonstrate the standard tort elements for a public nuisance on a par with those found in *Milwaukee*.[113] But that simple claim is hard to make. With GHGs, there is no trail of the waste that moves from one discrete location to another.[114] It is only the claim that there just has to be some effect from the use of GHGs that drives the notion that some diffuse set of harms, which are hard to identify and impossible to attribute to any temperature change—unlike the Maui and Los Angeles fires—are caused by GHGs.[115] At this point, it is surely relevant that all the poster children for global warming are overstated. The Pacific Islands have not sunk;[116] the polar bears still thrive;[117] and the Great Barrier Reef keeps coming back.[118] Even if GHGs did raise temperatures by some small amount, the defenders of reparations for global

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of equity jurisprudence, but rather has occupied the field through the establishment of a comprehensive regulatory program supervised by an expert administrative agency."

109. *See generally* Epstein, *supra* note 106.

110. City & Cnty. of Honolulu v. Sunoco LP, 537 P.3d 1173, 1180 (Haw. 2023). An effort to block this case by sending it to federal court was rebuffed in *Cnty. of San Mateo v. Chevron Corp.*, 32 F.4th 733, 747 (9th Cir. 2022). As of this date, the Supreme Court has not intervened.

111. City of N.Y. v. Chevron Corp., 993 F.3d 81, 85–86 (2d Cir. 2021) (barring the action on preemption grounds).

112. *See* sources cited *supra* note 105 (describing this Author's prior scholarship regarding public nuisance and jurisdiction for public nuisance claims).

113. *See* RESTATEMENT (SECOND) OF TORTS § 821B (AM. L. INST. 1979). *See generally City of Milwaukee*, 451 U.S. 304.

114. *See Gas*, MERRIAM-WEBSTER (11th ed. 2003) ("[A] fluid (such as air) that has neither independent shape nor volume but tends to expand indefinitely.").

115. *See, e.g.*, *Climate Change Impacts*, *supra* note 4 (describing several *diffuse* harms caused by climate change, including rising sea levels, displacements of species, and ocean acidification); *see also supra* notes 17–20 and accompanying text (discussing wildfires).

116. *See* Zhong, *supra* note 31 ("Even though sea levels have risen, many islands haven't shrunk. Most, in fact, have been stable. Some have even grown.").

117. *See* Richardson, *supra* note 35. *But see* Harvey et al., *supra* note 35, at 281.

118. *See* ANNUAL SUMMARY REPORT OF THE GREAT BARRIER REEF COAL REEF CONDITION, *supra* note 40 (discussing recent increases in coral cover).

warming must still explain why their major predictions have fizzled and why small changes demand huge payments. *Milwaukee* is far simpler than the many domestic or global public nuisance lawsuits, for that case pits a single (government) plaintiff against another single (government) defendant, when the existence of any major loss cannot be contested relative to the cost of their remediation.[119]

There are, moreover, in all cases, many variations on the rules of joint and several liability in play, but none of them work particularly well in the global reparations context, since the identification of the classes of both relevant plaintiffs and defendants are not easily determined.[120] And here, one powerful constraint is that the only proper form of liability does not hold each defendant responsible for the wrongs of other calls for separate (or several) liability, so that each of the named defendants could not be charged with losses that are attributable to the actions of others, given that it is utterly implausible to think that these supposed polluters worked in concert with any of the others.[121] That limitation on reparations is critical because the typical case identifies a few oil companies, and then claims that they should be responsible for their share of the pollution, without stating what the denominator is.[122] The suits furthermore claim the impossible: namely, that the award of massive payments should be regarded in isolation from any possible form of injunctive relief, even though huge damage awards have powerful disincentive effects on the production and distribution of fossil fuels throughout the world economy.[123] Accordingly, damage awards that have coercive effects by raising prices are uniformly blocked by any sensible system of preemption.[124]

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119. City of Milwaukee v. Illinois, 451 U.S. 304, 308–09 (1981).

120. Indeed, several issues in international law implicate similar issues regarding the difficulty of identifying individual parties and advancing their interests. *See, e.g.*, Emily L. Camins, *Needs or Rights? Exploring the Limitations of Individual Reparations for Violations of International Humanitarian Law*, 10 INT'L J. TRANSITIONAL JUST. 126, 139–41 (2016) (discussing limitations of a more individualized approach to reparations for harms caused by international conflicts).

121. *See* RESTATEMENT (SECOND) OF TORTS § 433A (AM. L. INST. 1965) (describing the requirements for joint and several liability, apportioning harms between two or more causes). For my extensive defense of this position, see Richard A. Epstein, *Whither Joint and Several Liability: Pareto Improvement or Covert Redistribution*, J.L. ECON. & POL'Y (forthcoming 2025).

122. *See* RESTATEMENT (SECOND) OF TORTS § 433A (AM. L. INST. 1965).

123. *See* Lindzen, Happer & Koonin, *supra* note 100, at 2–6 (discussing various impacts on the world economy from net-zero climate policies).

124. For an example of a Court upholding a sensible system of preemption, see, e.g., *San Diego Bldg. Trades Council v. Garmon*, 359 U.S. 236, 246–47 (1959):

> Nor is it significant that California asserted its power to give damages rather than to enjoin what the Board may restrain though it could not compensate. Our concern is with delimiting areas of conduct which must be free from state regulation if national policy is to be left unhampered. Such regulation can be as effectively exerted through an award of damages as through some form of preventive relief.

Preemption under *Garmon* was denied in *Glacier Nw., Inc. v. Int'l Bhd. of Teamsters Loc. Union No. 174*, 598 U.S. 771 (2023), when the employer alleged that the striking workers had

In the domestic cases, the targeted defendants are the individual oil companies that made and sold these products.[125] But it is a common feature of these cases that they do not sue for any direct emissions, given the limitations on such suits imposed by *American Electric Power Company v. Connecticut*, which held that the Clean Air Act ("CAA") preempts judge-made federal common law against emitters because of the obvious tension between these massive private lawsuits and direct administrative control of pollution and climate change.[126] But that decision did not explicitly ban state tort actions for direction emissions, even though there is no reason why these suits are less disruptive than suits brought in federal courts.[127] Yet those actions are then to be explicitly disclaimed in the state tort suits, as is the case in *City & County of Honolulu v. Sunoco LP*.[128]

The switch, however, in theory of liability—from direct emissions into the atmosphere to misrepresentation to drivers of cars and other vehicles—alters the choice of the proper defendants, who should now be the retail gasoline stations that have full information on the alleged dangers, and who raise no fine points of federal jurisdiction, given that they are local companies clearly within the jurisdiction of the state and who are in privity with their customers. At this point, local interests could and should be impacted. But no matter who is the defendant. On the merits, these cases should fail because every person who sells or uses gasoline in the state has direct and exhaustive knowledge of the risks of fossil fuels. Accordingly, there could be no reliance on allegedly false statements or omissions by the named defendants.[129] Nor is there any plausible claim of concealment of information that is commonly known. So, these cases should all fail.

The situation differs in the international arena where the targets of the lawsuits are the plaintiffs, e.g., the same states who sued the oil companies are now held responsible in principle for their losses. But how do these nation-versus-nation lawsuits look given that there is no tight correspondence whatsoever between developed nations and polluting nations? Many natural resources lie in undeveloped nations, and these countries right now engage in activities to extract, for example, the rare earths that are commonly needed to create electric vehicles whose presence is supported to control or reduce

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engaged in deliberate sabotage of the firm's business. There are such allegations in the current dispute. *Id.*

125. *See* Sandra Nichols Thiam & Jarryd C. Page, *Overview of Climate Litigation*, ENV'T L. INST. (Jan. 2023), https://cjp.eli.org/curriculum/overview-climate-litigation [https://perma.cc/AK83-PSPK] (describing the most common parties to climate litigation in the United States).

126. Am. Elec. Power Co. v. Conn., 564 U.S. 410, 429 (2011).

127. *See id.* at 429; *see also*, Thiam & Page *supra* note 125 ("[I]t remains an open question whether plaintiffs can use state common law against emitters.").

128. City & Cnty. of Honolulu v. Sunoco LP, 537 P.3d 1173, 1181 (Haw. 2023).

129. *See Fossil Fuel Accountability*, UNION OF CONCERNED SCIENTISTS, https://www.ucsusa.org/climate/accountability [https://perma.cc/82EW-Z35N] ("All [fossil fuel companies] are aware of the role their products play in climate impacts.").

global warming.[130] Indeed, even with respect to those activities undertaken exclusively in third-world countries—including the incredibly dirty procedures for extracting small amounts of rare earth metals from tons of raw earth[131]—the question remains as to whether the liability should attach to any firm from some developed country that does the extraction, or to the firm that hired this independent actor, where the typical answer is that both are responsible (subject to possible clauses for indemnification and contribution) to the rest of the world.[132] No one knows how these complications will play out, but these dangers are less defensible if it is unlikely that GHGs are the culprit for the damages attributable to climate change. Indeed, the irony could be that these harms are much more focused than carbon dioxide harms, for they look like the direct emissions at issue in the *Milwaukee* case. It hardly makes sense to swap out fossil fuels if the alternative sources of energy generate more extensive forms of pollution.[133] That may well be the case here, for any exclusive reliance on electric vehicles ignores the greater flexibility of hybrid vehicles and improved gasoline or diesel energies.

It is also critical to question the so-called one-directional movement of GHGs. Let us assume that the developed nations are able to extract more useful goods out of carbon dioxide with less cost than undeveloped nations with inferior technologies up and down the line.[134] Accordingly, the principle

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130. *See* Chris Geiregat & Susan Yang, *Too Much of a Good Thing?*, 50 FIN. & DEV. 8, 8 (2013) ("Many developing countries are endowed with exhaustible natural resources—such as oil, gas, minerals, and precious gems."); *Developing Countries Pay Environmental Cost of Electric Car Batteries*, U.N. TRADE & DEV. (July 22, 2020), https://unctad.org/news/developing-countries-pay-environmental-cost-electric-car-batteries [https://perma.cc/V7FE-H3F7] ("[T]he lion's share of the [lithium] is concentrated in a few developing countries.").

131. For some sense of the magnitude of the risk, see Iris Crawford, *Will Mining the Resources Needed for Clean Energy Cause Problems for the Environment?*, MIT CLIMATE PORTAL (July 21, 2022), https://climate.mit.edu/ask-mit/will-mining-resources-needed-clean-energy-cause-problems-environment (on file with the *Iowa Law Review*) (answering yes).

132. See, e.g., RESTATEMENT (SECOND) OF TORTS § 416 (AM. L. INST. 1965), which states an exception to the general rule that does not hold an employer liable for the torts of its independent contractor, of especial importance in mining cases, which reads:

> One who employs an independent contractor to do work which the employer should recognize as likely to create during its progress a peculiar risk of physical harm to others unless special precautions are taken, is subject to liability for physical harm caused to them by the failure of the contractor to exercise reasonable care to take such precautions, even though the employer has provided for such precautions in the contract or otherwise.

For the relevant case law, see, e.g., *Law v. Phillips*, 68 S.E.2d 452 (W. Va. 1952).

133. *But see* Camila Domonoske, *Their Batteries Hurt the Environment, but EVs Still Beat Gas Cars. Here's Why*, NPR (May 9, 2024, 2:34 PM), https://www.npr.org/2024/05/09/1250212212/ev-batteries-environmental-impact [https://perma.cc/L9Z4-YVB2] (comparing the negative environmental impacts of electric vehicle battery making with emissions from gas-powered cars).

134. *See generally* P. Romero Lankao, D. Nychka & J.L. Tribbia, *Development and Greenhouse Gas Emissions Deviate from the 'Modernization' Theory and 'Convergence' Hypothesis*, 38 CLIMATE RSCH. 17 (2008) (finding that developing countries lack means to acquire more efficient technologies).

of comparative advantage should take hold, so that the efficient outcome is for developed nations to take the lead on these carbon-intensive industries, and then sell the outputs of those activities to nations who do not have that expertise.[135] The net effect of that pattern is thus twofold. First, developed nations will do the work, but given the flows of international trade, one of the common assumptions of the restitution movement is now falsified, for it is no longer the case that the rich countries exploit the poor exclusively for their own ends, when international trade allows poorer countries to share the gains of richer ones,[136] not just by buying their goods but by allowing them to use their superior resources to engage in dangerous activities like mining.[137]

There is yet a second complication that arises from the powerful and favorable consequences of photosynthesis. Just assume that someone could calculate the actual losses suffered by certain nations from the rise in GHGs. The same forces that lead to those rises, also lead to the increase of positive effects of photosynthesis that are an offshoot of the same process.[138] As noted earlier, those gains are likely to be of a larger magnitude than the supposed effects on temperature and global welfare, at which point the setoff dominates the liability, so that we should all go home, and adopt a far more sensible environmental and energy strategy.[139] Take the money that would be spent on litigating these reparation cases and use it for two purposes. First, to ameliorate real scourges like malaria and malnutrition, and second to develop superior products, e.g., better engines and fossil fuels to reduce overall effects of pollution. The current set of reparation claims does neither of these, but it does provide talking points for international politicians and fat fees for enterprising lawyers. Neither is a social good that meets the misplaced ambitions of today's pro-reparation forces.

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135. *See* Ralph Ossa, *How Environmental Comparative Advantage Can Lead to Environmental Gains from Trade*, WORLD TRADE ORG. (Nov. 12, 2024), https://www.wto.org/english/blogs_e/ce_ralph_ossa_e/blog_ro_12nov24_e.htm [https://perma.cc/ACZ7-B6BQ] (there are environmental gains from trade when economies specialize based on their environmental comparative advantage).

136. *See generally* DOUGLAS A. IRWIN, FREE TRADE UNDER FIRE (3d ed. 2009) (concluding that international trade raises living standards of both countries and free trade does not deserve its bad reputation).

137. *See, e.g.*, Massa Coulibaly, Jeremy Foltz, Dominic Parker, Osaretin Olurotimi & Nouhoum Traoré, *The Effects of Mining on Local Poverty in Developing Countries: Evidence from Mali*, WORLD DEV. 9 (Apr. 2024), https://doi.org/10.1016/j.worlddev.2024.106605 (on file with the *Iowa Law Review*) (finding "mostly positive local economic spillovers from mining in Mali").

138. *See* Raúl Cassia, Macarena Nocioni, Natalia Correa-Aragunde & Lorenzo Lamattina, *Climate Change and the Impact of Greenhouse Gasses: CO_2 and NO, Friends and Foes of Plant Oxidative Stress*, FRONTIERS PLANT SCI. 3 (Mar. 2018), https://doi.org/10.3389/fpls.2018.00273 (on file with the *Iowa Law Review*) ("Short-term consequences of GHG increase in plants are mainly associated with the rise in atmospheric CO_2. Plants respond directly to elevated CO_2 increasing net photosynthesis, and decreasing stomatal opening."). *See generally* Zaichun Zhu et al., *Greening of the Earth and Its Drivers*, 6 NATURE CLIMATE CHANGE 791 (2016) (finding that CO_2 fertilization effects explain most of the greening trends in the tropics).

139. *See generally* Zhu et al., *supra* note 138.

CONCLUSION

There is little doubt today, just as there was little doubt years ago, that climate disasters can produce major catastrophes with massive loss of human life and property destruction.[140] The underlying forces are many and diverse, and few of them can be nipped in the bud by human actions. Thus, dams may help divert floods, but they cannot stop them. For many years, a sensible form of climate fatalism resisted any concerted effort to find some deep human causes behind these actions.

Today, the arc of history seems to be moving toward a far more politicized account of these disasters. As recounted here, the doomsday narrative starts with an uncritical condemnation of capitalist institutions which are found so uncaring as to make the developed nations of the world responsible for all the climate tragedies visited on the less developed portion.[141] Natural events are pushed to the background, as are the actions of the nations who claim that they are entitled to reparations from harms to which they in all likelihood have contributed.[142] The narrative is then advanced by a doomsday model, already falsified, of climate tragedies attacking Pacific Islands, polar bears, and coral reefs, which is then held to confirm the proposition that GHGs—most notably, carbon dioxide—are the culprit so that an increase in their concentration is said to be on the verge of triggering climate catastrophe.[143]

That story, however, rests on a highly contested view that water vapor that is everywhere in abundance is a consequence of GHG concentrations, with little or no direct or immediate impact on weather.[144] That proposition is true only in the extreme case where it is posited, foolishly, that water vapor can displace GHGs when surely they cannot provide the basic protection against solar energy.[145] But the tale here is not about some all-or-nothing scenario, but about how the relative strength of GHGs and water vapor, both indispensable for photosynthesis, interact in a very narrow temperature band, between 1.5 and 2.0 centigrade, to produce our weather patterns, where the major gaps in human knowledge resist any conclusion that elevates the elimination of human contributions to GHG as any major palliative for the current situation, given the solar and earthbound activities that contribute to the current climate situation.

Against this background, the grandiose claims for massive retribution should be rejected because they posit an unduly Manichean view of the world which treats some class of nations as entitled to damages of indeterminate magnitude from other nations from whom they receive massive benefits

140. *See* Statista Research Department, *supra* note 52.
141. *See* discussion *supra* Part II.
142. *See* discussion *supra* Part II.
143. *See* Part III.
144. *See* Lindzen, Happer & Koonin, *supra* note 100.
145. *See* discussion *supra* Part III.

through trade and public aid. So, the combination of political zeal and scientific oversimplification is in back of the current drive for climate reparations for "loss and damages," a movement that is best forgotten.