From: Kime, Robin
Location: 3500 WJCN
Importance: Normal
Subject: Introductory Meeting with Oren Cass
Start Date/Time: Thur 7/13/2017 6:00:00 PM
End Date/Time: Thur 7/13/2017 6:30:00 PM
170102-How to Worry About Climate Change (National Affairs).pdf
170321-The Problem with Climate Catastrophizing (FA).pdf
170417-Whos the Denier Now (NR).pdf
170531-Goodbye to Paris (Commentary).pdf
170601-Well Never Have Paris (CJ).pdf
170605-Dont Apologize for Being Honest about Climate Change (NRO).pdf

Directions: Please use the **William Jefferson Clinton North Entrance located on your right as you exit the Federal Triangle Metro Station**. Please arrive 20 minutes prior to the meeting with photo IDs to clear Security.

EPA Contact: For an escort from Security to the meeting call (202) 564-4332; for all other matters call Robin Kime (202)564-6587.

Contact: adamwhite.dc@gmail.com

Request: My friend and co-author, Oren Cass of the Manhattan Institute, has written far-and-away the best commentaries in recent months on climate, Paris, and the EPA. He has some advice for you on some things to consider as Administrator Pruitt structures his red-blue team approach. Specifically, he wants to urge you that one of the most valuable things you could do is to study the "baselines" that are being used to forecast potential emissions trajectories; this is a huge shortcoming of current science and is being badly mischaracterized/misused. An EPA analysis of it would be hugely valuable. I can't recommend strongly enough that you meet Oren soon Here's his bio. Some of Oren's recent commentaries in favor of reforming climate policy:

"The Problem with Climate Catastophizing" — *Foreign Affairs*, March 2017

"Who's the Deniers Now" — *National Review*, May 2017

"Goodbye to Paris: The Sin of Being Honest" — *Commentary*, May 2017

"We'll Never Have Paris: The climate change agreement was designed as a feel-good, do-nothing program" — *City Journal*, May 2017

"Don't Apologize for Being Honest about Climate Change" — *National Review*, June 2017

Debating President Trump's Withdrawal from the Paris Accord — NPR, June 2017

NATIONAL AFFAIRS

How to Worry about Climate Change

Oren Cass

"No challenge—no challenge—poses a greater threat to future generations than climate change," said President Barack Obama in his 2015 State of the Union address. Yet his own administration's best estimate for the economic cost of that challenge, if left unaddressed, totaled only 1% to 4% of annual global GDP by 2100. For comparison, while promoting the Affordable Care Act in 2009, the president's Council of Economic Advisers estimated that "genuine health care reform" could increase U.S. GDP by 8% by 2030. A 2015 report by the McKinsey Global Institute estimated that improvements in gender equality worldwide could increase global GDP by 11% by 2025. In what way, then, is the challenge of climate change "greater"?

To be sure, GDP offers a notoriously incomplete measure of human flourishing. But the real problem with assessing Obama's assertion is more fundamental: Climate change is a different *kind* of problem from health-care reform, gender equality, or almost any traditional subject of political attention and action. Its relevant effects are still decades or centuries away. Scenarios with the most extreme effects, rather than the most likely ones, provide the sense of urgency and the rationale for policy responses. Those extreme outcomes are often distant ripples from the initial effect of a warmer climate, transmitted outward through multiple steps of causation and combined with other factors to produce or amplify the damage. By the time actual impacts arrive, the time for action may have long passed. But if climate change is not a typical policy problem, how should policymakers approach it?

This is not an abstract question. As a new administration takes office, it must recalibrate from the extraordinary attention its predecessor

Oren Cass is a senior fellow at the Manhattan Institute.

lavished on the issue. Where does climate change fit in the constellation of challenges facing the nation and the world? For the administration's opponents, how much energy should go toward lamenting a shift in climate policy versus highlighting other areas of concern?

Much of the political rhetoric and policy analysis surrounding climate change starts from a premise that the challenge is truly unique, demanding unparalleled levels of focus and action. A climate-change conference could attract the United Nations' largest ever gathering of world leaders in 2015 because, as French president Francois Hollande declared at its opening, "never—truly never—have the stakes of an international meeting been so high. For the future of the planet, and the future of life, are at stake." Comparisons to World War II have become commonplace, and proponents of strong climate action deride their opponents as "deniers"—a term previously associated with refusal to acknowledge the occurrence of the Holocaust. Left-wing politicians from former vice president Al Gore to Senator Bernie Sanders to New York City mayor Bill de Blasio warn that human civilization hangs in the balance.

This framing influences policy directly. During the 2016 Democratic primaries, for instance, Senator Sanders suggested the nation's mobilization for World War II in 1941 was "exactly the kind of approach we need right now," while former senator and Secretary of State Hillary Clinton offered her plan to create a dedicated "climate map room" in the White House, akin to President Franklin Roosevelt's own map room during that same war. The mindset is reflected in the Democrats' official platform, which "commit[s] to a national mobilization, and to leading a global effort to mobilize nations to address this threat on a scale not seen since World War II." Lest the claims be taken as less than literal, the *New Republic* clarified in its headline of an article by activist Bill McKibben: "We Need to Literally Declare War on Climate Change."

Based on such dire outlooks, advocates of aggressive climate action justify their proposals under the "precautionary principle" or as "insurance," even where the measurable costs appear to far outweigh measurable benefits. They dismiss skepticism about that approach as an irrational failure to understand the scope of the problem or an excessive discounting of future damage. "If global warming took out an eye every now and then," scoffed Dan Gilbert, professor of psychology at Harvard University, "OSHA would regulate it into nonexistence."

But the unmooring of climate change from any conventional policy framework has been rhetorical rather than reasoned. It requires justification—otherwise, the obsessive and apocalyptic politics built atop it cannot be supported. Yes, climate change is a problem. But what *kind* of problem?

Calibrating Our Worries

Climate change stands apart from typical challenges in three important respects. First, whereas most challenges are *immediate*, climate change is *forecasted*. The political process usually engages with problems as they present themselves or based on expected consequences of current events. The claim that high corporate-tax rates drive businesses overseas, or that high college tuition burdens graduates with overwhelming debt, can be tested against experience and quantified in terms of ongoing costs. Claims about climate change cannot. Scientists do strive to identify contemporary costs, but the scale of the challenge and the case for action depend on calamities yet to come—indeed, assertions that climate change will be far outside of existing experience often play a central role in the case for its significance. Yet this absence of reference points creates a double-edged uncertainty: Compared to most policy issues, the level of risk seems high but the level of confidence in predictions is low.

Second, whereas most challenges are *static*, climate change is *irreversible*. Medical errors kill more than 250,000 Americans each year, according to researchers at Johns Hopkins University. Those deaths each represent an individual tragedy and, applying the EPA's preferred estimate of $10 million per life, cost a staggering 15% of national GDP. But deaths one year have little effect on society's capacity to make future progress on the issue. Even most forecasted problems share this characteristic: If demographic trends suggest an impending shortage of nursing-home beds and politicians ignore the warnings, more capacity can still be built after the crisis hits. With climate change, by contrast, scientists warn the planet will reach a point of no return. Carbon dioxide, once emitted into the atmosphere, remains there for centuries. If temperatures rise and predicted meteorological dominos begin to fall, subsequent efforts to reduce emissions will not offer relief.

Third, whereas most challenges are *confined*, climate change is *pervasive*. The typical forecasted problem, even if irreversible, has limited reach. Population growth in the American Southwest may drive some species to extinction in the coming decades. But there, or near there, that particular

causal chain likely ends. It is constrained geographically, thematically, and in the extent of damage. Not so with climate change. Its global scope and linkages to many critical environmental and economic systems invite the conjuring of disruptions in every cranny of modern civilization.

Climate change—*forecasted*, *irreversible*, and *pervasive*—might therefore be called a "worrying problem." Here, "worrying" does not mean "concerning" (though it is that as well), but rather something tailor-made for worry. Its effects exist primarily in the imagination and have poorly defined bounds that encourage speculation; a point of no return looms. Yet the contours of those bounds and that point may become clear only after it is too late to correct course.

Other worrying problems exist. They tend to emerge where clear long-term trends in technological or social change produce concerning side effects. The obvious trajectory of growing fossil-fuel consumption, prerequisite (with current technology) to continued global industrialization, produces the climate challenge. Similarly, ever-denser urbanization coupled with ever-more-frequent travel from ever-more-remote locations produces an ever-greater risk of a global pandemic. Such a pandemic is widely forecast to occur though the timing is unknowable; it will be too late to prevent once underway, and it has the potential to cause catastrophic damage throughout society. Increasing urbanization also exposes society to both higher levels of social unrest and disruption by increasingly powerful and well-coordinated non-state actors.

Overuse of antibiotics around the world could render them useless in the face of rapidly evolving bacteria, possibly setting back medical progress against disease and infection by decades. The rising sophistication, ubiquity, and interconnectivity of financial systems threaten a global economic meltdown of the type only narrowly averted in 2008. The democratization of communications technologies has already provided fertile ground for terrorist networks to recruit, coordinate, and promote themselves. Nuclear weapons represent in some respects a quintessential worrying problem, though an oddly binary one: Their likely effects are all too well-understood; their risk remains roughly as present this year as last year as next. The issue typically attains salience only when conditions suggest risk is trending upward—as early in the Cold War, during periods of proliferation, or when leaders appear potentially willing to countenance their use.

Just as technology can provide a vector to heighten some risk, it can also pose the risk itself. For instance, many experts fear the prospect of

faster computing hardware and more sophisticated software ultimately yielding superhuman and potentially hostile artificial intelligence. Computer viruses, meanwhile, might someday allow their creators to commandeer the basic infrastructure of modern society. Continued advancements in nanotechnology—especially if weaponized—raise comparable fears of tools either inadvertently escaping the control of their creators or being deployed maliciously.

All these are worrying problems. All present a potential scope of damage that is at this point only hypothetical but could be almost unlimited—in part *because* it is only hypothetical. Each is plausibly foreseeable given present trends, and each would defy prevention once underway, yet for each the moment or probability of reckoning is impossible to know.

Worrying problems can also be sociological, rather than technological. Declining fertility rates coupled with extending lifespans, for instance, pose precisely *forecasted*, *irreversible*, and *pervasive* challenge to modern civilization. So too do economic and social transitions with the potential to make large swathes of the working-age male population effectively unemployable. Insofar as two-parent families are a crucial contributor to successful child-rearing, the collapse of that social norm and its compounding across generations likewise exhibits the characteristics of a worrying problem.

Those may not seem intuitively like problems similar to climate change. But imagine President Obama describing riots in Baltimore as he might describe a major hurricane strike: "While sociologists say no individual riot can be linked conclusively to the absence of two-parent families, this social unrest is exactly the type they say will become more prevalent and severe as the trend worsens." The problems may not seem as catastrophic. But that is a question of degree, not kind, and therefore one that permits relevant comparison. If one of these worrying phenomena were only to slow annual productivity growth by one-tenth of one percentage point for only one-tenth of the population, the economic impact three generations hence would be of the same magnitude which is forecast in climate-change models.

Even the sustainability of the Western welfare state itself is a worrying problem. In the United States, the federal government has tens of trillions of dollars in unfunded entitlement liabilities and a debt poised to spiral out of control if interest payments begin to swallow the national budget; most other developed economies face situations at least

as dire. A collapse would have immeasurable economic and geopolitical implications yet may give almost no advance warning.

There is, in short, much to worry about. But while these problems all look fundamentally different from other policy challenges—and by their *forecasted*, *irreversible*, and *pervasive* nature defy traditional tools of policy analysis—they stack next to each other quite cleanly. Perhaps climate change and deferred bridge maintenance require different risk-tolerance assumptions. But the thinking applied to climate change and pandemics should be similar. Perhaps it makes no sense to compare the long-term threat from water-supply disruptions with the present cost of medical errors. But water stability and family stability have much more in common.

Worrying problems demand greater focus than day-to-day political pressure might otherwise prompt, but long-term risks cannot be allowed to sap all attention away from the more routine but also more painful realities of the moment (consistent progress on the latter is every bit as important to society's long-term health). In isolation, each worrying problem can seem overwhelming. But they cannot all be the greatest challenge of future generations, or grounds for mobilization on a scale not seen since the global fight against fascism.

Each reader will likely have his own reaction to the worrying problems listed here—which genuinely qualify and which others have been overlooked; which among them is truly forecasted, irreversible, and pervasive; whether those are even the correct dimensions. But at least those are concrete and constructive discussions. The classification of problems into hierarchies, the establishment of shared assumptions built with a common vocabulary, and reasoning by analogy are all critical to determining appropriate tools of government power, the allocation of resources, and the tolerance for risk.

We should heed the well-known warning: "What worries you masters you." We need to choose and calibrate our worries with care. If, at least, climate change is a worrying problem but not the *only* one, what makes it most worrying of all?

expectatiOns in perspective

Environmental activists have an immediate and predictable response: "because we *know* climate change is going to happen." But that conflates two very different conceptions of climate change—*expected* change and *extreme* change.

The scientific consensus holds that the climate is warming and human activity plays a substantial role. But there is no consensus about how much warming human activity has caused or will cause. According to the Fifth Assessment Report of the United Nations' Intergovernmental Panel on Climate Change (IPCC) in 2013, the best estimates of warming for a given increase in the atmospheric concentration of carbon dioxide range by a factor of three, a range that has grown wider in recent years. A doubling of carbon dioxide could produce a temperature increase of 1.5 degrees Celsius, or 4.5 degrees Celsius, or more likely something in between. *Expected* climate change, averaging the widely varying projections and assuming no aggressive efforts to reduce greenhouse-gas emissions, entails warming of 3 to 4 degrees Celsius by 2100.

Even focusing within that range, estimates for the expected environmental *impacts* of warming vary widely. The IPCC represents the gold standard for synthesizing scientific estimates, and, crucially, its best guesses bear little resemblance to the apocalyptic predictions often repeated by activists and politicians. For instance, the IPCC estimates that sea levels have risen by half a foot over the past century and will rise by another two feet over the current century. At the high end of the 3-to-4-degree range, it reports the impact on ecosystems will be no worse than that of the land-use changes to which human civilization already subjects the natural world.

The responsibility for translating these and other disruptions into economic costs falls to Integrated Assessment Models (IAMs). To create its "Social Cost of Carbon," the Obama administration surveyed this economic literature and focused specifically on three models whose forecasts themselves vary widely, even starting from a common level of warming. For warming of 3 to 4 degrees Celsius by 2100, the middle of the three models estimates an annual cost of 1% to 3% of GDP. The low case estimates 0 to 1%. The *high* case estimates 2% to 4%. While 4% is a large dollar amount, arriving at that impact over nearly 100 years implies almost imperceptibly small changes in economic growth.

The specifics of this high-case model are informative: The Dynamic Integrated model of Climate and the Economy (known as the DICE model) developed by William Nordhaus at Yale University estimates 3.8 degrees Celsius of warming by 2100 costing an associated 3.9% of GDP in that year. But over time, this cost is the equivalent of slowing economic growth by less than one-tenth of one percentage point annually. By 2100, regardless of climate change, the world is more than six times

wealthier than in 2015 under this model; global GDP is $500 trillion. The effect of climate change is to reduce that gain from a multiple of 6.7 to a multiple of 6.5. The economy also continues to grow, so that the climate-change-afflicted world of 2105 is already much wealthier than a world of 2100 facing no climate change at all.

Such estimates might seem counterintuitively low, especially given the rhetoric often employed. Part of the explanation lies in the almost incomprehensible economic progress that human civilization is capable of making over the course of a century. The annual cost identified by Nordhaus in 2100 is $20 trillion—massive by the standards of 2015, manageable by the standards of 2100. Further, that cost repeats every year even as the impacts are spread over many years. Thus, over the 2090 to 2110 time period, Nordhaus envisions the world spending a stunning $350 trillion to cope with climate change. One might despair over what else such resources might accomplish over that time period. But one must also recognize that the economy of 2100 will likely be able to allocate those resources toward climate change while also allocating to every other facet of society far more resources than are available today.

Corroborating these models, the IPCC concludes that "for most economic sectors, the impacts of drivers such as changes in population, age structure, income, technology, relative prices, lifestyle, regulation, and governance are projected to be large relative to the impacts of climate change." In other words, other worrying problems have a far greater capacity to influence progress.

None of this means the dislocations from climate change would be painless or the disruptions cheap. It is merely to observe that the impacts *expected* from climate change over the next hundred years look similar to those through which both civilization and our planet have successfully muddled over the past hundred and continue to struggle with today. Other worrying problems have their own anticipated but less-severe analogs, too. Whether a global pandemic strikes, epidemics will inevitably occur like the 2014 Ebola outbreak in West Africa that claimed more than 10,000 lives and cost the three countries at its center more than a tenth of their GDP. Whether artificial intelligence makes humans superfluous, self-driving vehicles could throw millions out of work in the years to come. Some countries will default on their debt; some business cycles will spawn deep global recessions.

These challenges are not existential threats or even ones that require analysis outside the standard policy process—that is, they are not really worrying problems at all.

extreme cases

If *expected* climate change represents the most likely outcome, *extreme* climate change represents the worst case: Models could be underestimating the warming that emissions will cause; feedback loops could send a 3-degree increase suddenly careening higher; or even at the expected level the climate could hit a tripwire that collapses global ecosystems or ocean currents or ice sheets or some other prerequisite of modern civilization.

Any of these things may be true—as is the nature of genuine *forecasted* challenges, they are mostly non-falsifiable. But while extreme climate change is a quintessentially worrying problem, it is also one that has no guarantee or even likelihood of occurring. Certainly, the "scientific consensus" or even the "scientific mainstream" on climate change does not extend to confidence in such scenarios.

To compare extreme climate change with other worrying problems, it is helpful to consider the dimensions that make a problem "worrying": that it is *forecasted*, *irreversible*, and *pervasive*. On all three, climate change appears less worrying than most.

Consider, first, the magnitude of the forecasted impact. Many worrying problems feature the credible prospect of killing a significant share of the human population or erasing modern civilization. Not extreme climate change. For instance, even considering higher temperature increases, the IPCC concludes that:

> Global climate change risks are high to very high with global mean temperature increase of 4°C or more above preindustrial levels in all reasons for concern, and include severe and widespread impacts on unique and threatened systems, substantial species extinction, large risks to global and regional food security, and the combination of high temperature and humidity compromising normal human activities, including growing food or working outdoors in some areas for parts of the year.

Obviously, each of those effects would entail enormous economic costs, carry severe consequences for entire nations, and wreak havoc with the

natural environment. But as a worst case, it nevertheless pales in comparison to catastrophes that might kill a significant share of the human population or erase the basic physical and economic infrastructure of modern civilization.

Serious efforts to quantify existential threats concur. A 2016 report by the Global Priorities Project at Oxford offered as its example of a worst case that climate change could "render most of the tropics substantially less habitable than at present," as compared to hundreds of millions or billions of deaths associated with other challenges. Another Oxford study from 2008 asked conference participants to estimate the probability of various global catastrophes leading to human extinction in the coming century, and did not even see fit to include climate change as an option, while respondents gave molecular nanotechnology, superintelligent artificial intelligence, and an engineered pandemic each at least a 2% chance of erasing humanity by 2100.

Some analysts nonetheless place climate change among humanity's genuinely existential threats on the basis of its "fat tail," arguing that some unknowable but non-zero chance exists at the far-right end of the probability distribution for an outcome with essentially infinite cost. But this is true of all worrying problems—indeed, the characteristics of worrying problems might be viewed as those that generate such unknowable non-zero probabilities. Climate change cannot be *distinguished* from other worrying problems on that basis. Rather, the argument begs the question: What characteristics of climate change make its tail relatively fatter or thinner?

The weight accorded to a worrying problem's forecasted effects depends greatly on the number of causal steps between the underlying phenomena and worst-case outcomes. Where fewer steps are necessary, or where steps are relatively more likely to occur, the probability of the worst case arising should increase. For instance, whether an engineered pandemic devastates humanity depends on development of the necessary technology (highly likely), its use by a malicious actor (indeterminate), and its spread defying efforts at containment (indeterminate). Generally speaking, technological threats will have the shortest chains while sociological threats will have the longest ones.

Climate change would appear to sit somewhere in between. It has a very short chain to *some* impact—indeed, higher atmospheric concentrations of carbon dioxide are already having effects. But the connection

from warmer temperatures to civilizational catastrophe is highly attenuated. The initial warming must cross thresholds that produce feedback loops. The ensuing warmth must produce environmental effects that cause unprecedented crises across societies. Those crises must in turn overwhelm the coping capacity of the entire global community, which must in turn produce wide-scale breakdowns in social order or trigger military conflict, which must in turn metastasize into what? Certainly, one can invent a scenario. But the specifics quickly become hazy, and a worst case entirely outside of human experience difficult to articulate.

The intent of this analysis is not to dismiss the severity of worst-case climate scenarios or to suggest that "wide-scale breakdowns in social order" are acceptable. But all worrying problems have worst-case forecasts that look this way, all with indeterminate probabilities of occurring, which leaves only a few options: We could become overwhelmed with despair, emphasize whichever problems are most politically useful, or seek out qualitative and quantitative bases for analysis. Too much discussion of climate change adopts the first or second approach. Efforts at the third approach will inevitably be imprecise and imperfect, but the burden of proof should lie on those declaring that climate change stands *apart* from other worrying problems to explain why that is so. The suggestion here is not that the *forecasted* threat of climate change does not belong alongside other worrying problems, only that the nature of its forecast cannot be what separates it as uniquely worrying.

Worrying in Slow Motion

In the other ways climate change is a worrying problem, meanwhile, it is less worrying than most. This is especially true with respect to irreversibility. While President Obama has lamented that climate change is a "comparatively slow-moving emergency," the one thing worse is a fast-moving one. Most worrying problems have worst-case scenarios that sweep the globe in a matter of months, days, or even minutes. For climate change, the damage unfolds over decades or centuries. This has several implications.

First, while climate change is irreversible compared to the typical policy problem, it does allow for some potential interventions even once well underway. For instance, natural processes already exist for extracting carbon dioxide from the atmosphere, and new technologies could be developed that accelerate those processes or create artificial ones. Alternatively, humans could use so-called "geoengineering" to

effect other changes in the climate system that might counteract an intensifying greenhouse effect. These approaches offer no guarantee or even likelihood of success; turning to geoengineering might be seen as a disaster in its own right. But they offer more cause for optimism than exists with many other worrying problems.

Second, time permits adaptation. While the prospect of losing 50% of existing agricultural capacity is daunting, over a 50-year period only 1% of capacity needs to shift annually. By comparison, over the past 50 years, total agricultural output has tripled. Similarly, the need for hundreds of millions of people to migrate over a century amounts to little out of the ordinary on an annual basis. There are, for instance, more than 200 million migrant workers within China, as well as another 200 million international migrants and at least 60 million refugees around the world right now. The United Nations estimates 2.5 billion people will migrate to cities in just the next 35 years. Further migration, or perhaps the gradual abandonment of some cities or even entire regions, would obviously be extraordinarily costly and disruptive in human, economic, and environmental terms. But the reason such adaptations are rarely mentioned in the context of other worrying problems is not that they would be unnecessary, but rather that, in those other cases, they would be either impossible or else futile.

Purveyors of creatively catastrophic climate cases also face a Catch-22: Developing ever-more extreme scenarios typically requires ever-longer timescales. Even higher temperatures and risks of further dominos falling are threatened by 2300, or after "centuries." Confident forecasts of multi-meter sea-level rises are issued, to occur over multiple millennia. Harvard University's Martin Weitzman, the leading proponent of the case that climate change presents a uniquely "fat tail," falls into precisely this trap: The worst case he offers relies on continued temperature increases over multiple centuries. But if heightening the threat requires extending the timeframe further, it becomes diluted threefold: More time becomes available for adaptation, for economic progress and technological innovation that render the threat irrelevant, or for the model to fail. Any impact forecasted for 200, let alone 2,000, years into the future becomes almost inherently less cognizable than those already under study for 2100.

Finally, consider the pervasiveness of extreme climate change. By influencing the literal atmosphere in which all other human activity

takes place, climate change perhaps exceeds any other challenge in the breadth of its causal connections and potential effects. But this same dynamic also leaves its connections to ultimate damage more dependent on interaction with other contributing factors. As a result, more alternative approaches exist for mitigation.

If one wants to prevent a financial collapse from sending the world into economic depression, one needs to prevent the collapse. By contrast, consider a favorite present-day causal chain used to illustrate the full specter of the climate threat: the asserted connection between climate change, drought in the Middle East, social upheaval in Syria, the country's gruesome civil war, the rise of ISIS, and the flood of refugees into Europe. Perhaps the catastrophe might have been averted or lessened had there been no drought. But better weather would seem an odd prescription for stability and prosperity in the Middle East, certainly neither necessary nor sufficient. Democratic governance, social progress, more effective Western intervention by either regional or global powers, or even just better water-usage practices are all superior approaches.

Another country, bordering Syria, has suffered the same drought. But a report in *Scientific American* explains, "Water is driving the entire [Middle East] to desperate acts. Except Israel. Amazingly, Israel has more water than it needs." While Syria's oppressed society was crumbling, Israel launched a new era of desalination technology. The writer concludes: "The contrasts couldn't be starker. A few miles from [Israel], water disappeared and civilization crumbled. Here, a galvanized civilization created water from nothingness. As Bar-Zeev and I drink deep, and the climate sizzles, I wonder which of these stories will be the exception, and which the rule."

This is compelling storytelling. At first glance it seems a cautionary tale of climate change. But read the concluding sentence again. Climate change is not the independent variable, it is the constant. The question is whether civilization will equip itself to thrive anyway. What separates a world of 2100 dominated by drought-plagued failed states and one filled with prospering democracies that export water from blooming desert plains is not climate change. It is the world's ability to supplant radical ideology with modernity. This same pattern repeats itself in equipping societies to withstand natural disasters, feed themselves, eradicate disease, or thrive in the face of any other challenge climate change might pose.

Perhaps sociological challenges like declining fertility, workforce participation, or family stability seemed out of place in the initial list of worrying problems. Yet it is these, not genuinely existential threats to humanity, with which climate change has the most in common. They all impose real costs but rely on lengthy causal chains to reach from basic phenomenon to true catastrophe. They all unfold slowly and leave opportunity for intervention. Their pervasiveness in each case depends on interaction with other sociological conditions that all invite policy interventions themselves. These worrying problems deserve attention, but not out of proportion to the genuine nature of the threat they pose.

Worrying Properly

"ISIS is not an existential threat to the United States," President Obama told the *Atlantic*'s Jeffrey Goldberg. "Climate change is a potential-existential threat to the entire world if we don't do something about it." The claim is nonsensical because it compares a worrying problem to the traditional national-security challenge of a specific terrorist group. Obviously, the former will appear more like an "existential threat." Conversely, one might choose a measure that would shift the calculus: ISIS and ISIS-inspired actors killed more Americans in 2016 than did climate change.

The discussion would be more constructive, and dramatically different, if "ISIS" were converted into the worrying problem of which it represents an early manifestation: As an existential threat, how does climate change compare to increasingly potent religious extremism that leverages technological advances to increase coordination, propaganda, and force? Which links more credibly to greater catastrophe given a 100-year timeframe? Which will prove more difficult to reverse or adapt to? In October, President Obama observed:

> There's already some really interesting work—not definitive, but powerful—showing that the droughts that happened in Syria contributed to the unrest and the Syrian civil war. Well, if you start magnifying that across a lot of states, a lot of nation states that already contain a lot of poor people who are just right at the margins of survival, this becomes a national security issue.

Surely that remains at least as true if the word "droughts" is replaced with "rise of radical Islam."

The president's insistence on treating ISIS only on its current terms rather than considering a long-term, worst-case scenario is precisely the purported error in logic for which he chides anyone who refuses to feel the burning urgency of climate change because its effects today are not large. Or conversely, the over-politicization of radical Islam he insists on rising above bears striking resemblance to the over-politicization of climate change he purveys.

According to the Associated Press, only 17% of Americans "are alarmed by climate change and want action now." At the other extreme, 10% "are dismissive, rejecting the concept of warming and the science." The silent majority is either "concerned, thinking it's a man-made threat, but somewhat distant in time and place" (28%) or "cautious, still on the fence" (27%). That "alarmed" 17% tends to believe it has a monopoly on rational assessment of the situation and resorts to psychological explanations for the failure of others to join. But if climate change is just one worrying problem among many, the silent majority may have it right. In which case some of that psychological analysis might best be turned inward.

For instance, Harvard geology professor Daniel Schrag observed in a recent lecture, questioning reluctance to take decisive climate action: "People scratch their heads and say: Why don't people do what's right? Well, maybe they're rational. It's hard to accept. But in fact, maybe they actually don't value the future as much as some of us do." Schrag correctly identifies that the divide in perspectives on climate change reflects in part two different views on the future. But he simply assumes it is he and his audience who have it right. Yes, humans may irrationally discount future harms. But they also routinely fail to account for the way technological and societal change will render forecasts of the distant future useless. This latter error is especially prevalent in the environmental realm, where predictions of impending resource scarcity and civilizational collapse have been made frequently and proven wrong with equal frequency.

"Alarmed" analysts also complain that climate change is difficult to communicate because it is too abstract or too far removed from everyday concerns. But at least compared to most worrying problems, climate change is highly accessible. At the conceptual level, environmental calamity—especially one purportedly caused by malfeasance—has been a subject of fascination for the human psyche since the beginning of recorded history. More tactically, every natural disaster, extreme

temperature reading, and even geopolitical event has become an excuse to talk about climate change either by claiming a potential link, or else by asserting that it represents the kind of incident that will become more common. People who understand these events to be an endless rush of "signals" would understandably but irrationally elevate climate change above other worrying problems, even as the majority correctly tunes out most of the speculation as mere noise.

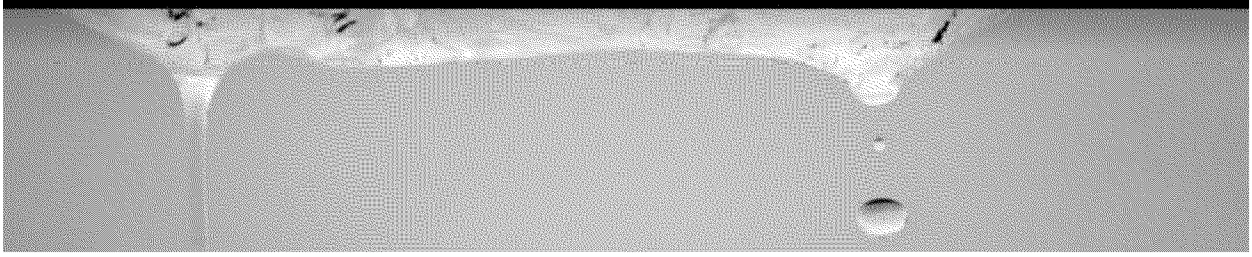
Perhaps most important, motivated reasoning might play a role. The typical claim holds that, because people do not like the proposed solutions to climate change, they prefer to minimize the extent of the problem. But it also seems to be the people most enamored of those policies who consider climate change uniquely demanding of the world's attention. If they are wrong, it might be in part their enthusiasm for a government-led green agenda that has led them astray. Notably, their emphasis on addressing climate change has fallen by the wayside when faced with policy options – nuclear power, fracking in China, carbon taxes offset by tax cuts, renewable facilities in environmentally sensitive areas – that demand tradeoffs with their other priorities. In 2016, for instance, activists in Washington state opposed a statewide carbon tax partly because its revenue would not be set aside for "necessary investments in our communities" and because tax supporters were not "listening to communities of color."

"Global warming," they wrote, "does not just represent an intersection of some of the most pressing challenges of our time – it also represents our opportunity to address these core issues."

A more dispassionate placement of climate change alongside a range of worrying problems does not mean there is nothing to worry about. But it points away from *sui generis* mitigation at all costs and toward an existing model for addressing problems through research, preparation, and adaptation. It suggests that analytical exercises that would never be applied to other worrying problems, like assigning a "social cost" to each marginal unit of carbon-dioxide emissions, are as inappropriate as estimating a "social cost of computing power" as it brings humanity closer to a possible singularity, or a "social cost of international travel" as it elevates the risk of a global pandemic. Taxes on any of them are closer to political statements than efficient corrections of genuine externalities, and each would be more likely to stall meaningful economic and technological progress than to achieve a meaningful reduction of risk.

Lessons might run in the other direction as well: We are not focusing as much on other challenges as we should. And perhaps, if climate change were consigned to its rightful place in the crowd, some additional attention might be available to concentrate elsewhere. If the level of research support, policy focus, and international coordination targeted toward climate change over the past eight years had gone instead toward preventing and managing pandemics, imagine the progress that could have been made. For a fraction of the cost of de-carbonizing an industrial economy, it could be hardened against cyber attacks; with a fraction of the attention corporations pay to their own purported climate vulnerability, they could make real strides in their own technological security.

A little bit of worry provides healthy motivation. Too much is a recipe for paralysis, distraction, and overreaction.



SNAPSHOT March 21, 2017 Climate Change

The Problem With Climate Catastrophizing

The Case for Calm

By Oren Cass

Climate change may or may not bear responsibility for the flood on last night's news, but without question it has created a flood of despair. Climate researchers and activists, according to a 2015 *Esquire* feature, "When the End of Human Civilization is Your Day Job," suffer from depression and PTSD-like symptoms. In a poll on his Twitter feed, meteorologist and writer Eric Holthaus found that nearly half of 416 respondents felt "emotionally overwhelmed, at least occasionally, because of news about climate change." For just such feelings, a Salt Lake City support group provides "a safe space for confronting" what it calls "climate grief."

Panicked thoughts often turn to the next generation. "Does Climate Change Make It Immoral to Have Kids?" pondered columnist Dave Bry in *The Guardian* in 2016. "[I] think about my son," he wrote, "growing up in a gray, dying world—walking towards Kansas on potholed highways." Over the summer, National Public Radio tackled the same topic in "Should We Be Having Kids In The Age Of Climate Change?" an interview with Travis Rieder, a philosopher at Johns Hopkins University, who offers "a provocative thought: Maybe we should protect our kids by not having them." And Holthaus himself once responded to a worrying scientific report by announcing that he would never fly again and might also get a vasectomy.

Such attitudes have not evolved in isolation. They are the most intense manifestations of the same mindset that produces regular headlines about "saving the planet" and a level

of obsession with reducing carbon footprints that is otherwise reserved for reducing waistlines. Former U.S. President Barack Obama finds climate change "terrifying" and considers it "a potential existential threat." He declared in his 2015 State of the Union address that "no challenge—no challenge—poses a greater threat to future generations." In another speech offering "a glimpse of our children's fate," he described "Submerged countries. Abandoned cities. Fields that no longer grow. Political disruptions that trigger new conflict, and even more floods of desperate peoples." Meanwhile, during a presidential debate among the Democratic candidates, Vermont Senator Bernie Sanders warned that "the planet that we're going to be leaving our kids and our grandchildren may well not be habitable." At the Vatican in 2015, New York Mayor Bill de Blasio shared his belief that current policy will "hasten the destruction of the earth."

A boy flies his kite on dry and cracked farmland in San Juan town, Batangas province, south of Manila, April 18, 2010.

ROMEO RANOCO / REUTERS

And yet, such catastrophizing is not justified by the science or economics of climate change. The well-established scientific consensus that human activity is causing the climate to change does not extend to judgments about severity. The most comprehensive and often-cited efforts to synthesize the disparate range of projections—for instance, the United Nations' Intergovernmental Panel on Climate Change (IPCC)

and the Obama administration's estimate of the "Social Cost of Carbon"—consistently project real but manageable costs over the century to come. To be sure, more speculative worst-case scenarios abound. But humanity has no shortage of worst cases about which people succeed in remaining far calmer: from a global pandemic to financial collapse to any number of military crises.

What, then, explains the prevalence of climate catastrophism? One might think that the burgeoning field of climate psychology would offer answers. But it is itself a bastion of catastrophism, aiming to explain and then reform the views of anyone who fails to grasp the situation's desperate severity. *The Washington Post* offers "the 7 psychological reasons that are stopping us from acting on climate change." Columbia University's Center for Research on Environmental Decisions introduces its guide to "The Psychology of Climate Change Communication" by posing the question:"Why Aren't People More Concerned About Climate Change?" In its 100-page report, the American Psychological Association notes that "emotional reactions to climate change risks are likely to be conflicted and muted," before considering the "psychological reasons people do not respond more strongly to the risks of climate change." The document does not address the possibility of overreaction.

Properly confronting catastrophism is not just a matter of alleviating the real suffering of many well-meaning individuals. First and foremost, catastrophism influences public policy. Politicians regularly anoint climate change the world's most important problem and increasingly describe the necessary response in terms of a mobilization not seen since the last world war. During her presidential campaign, Democratic candidate Hillary Clinton promised a "climate map room" akin to Roosevelt's command center for the global fight against fascism. Rational assessment of cost and benefit falls by the wayside, leading to questions like the one de Blasio posed in Rome: "How do we justify holding back on any effort that may meaningfully improve the trajectory of climate change?"

Catastrophism can also lead to the trampling of democratic norms. It has produced calls for the investigation and prosecution of dissenters and disregard for constitutional limitations on government power. In *The Atlantic*, for example, Peter Beinart offered climate change as his first justification for an Electoral College override of the election of Donald Trump as U.S. president. The Supreme Court has taken the unprecedented step of halting implementation of the Clean Power Plan, Obama's signature climate policy, before a lower court even finished considering its constitutionality; his law-school mentor, professor Larry Tribe, likened the "power grab" of his star pupil's plan to "burning the Constitution."

The alternative to catastrophism is not complacency but pragmatism. Catastrophists typically condemn fracked natural gas because, although it results in much lower greenhouse-gas emissions than coal, it does not move the world toward the zero-emissions future necessary to avert climate change entirely. Yet fracking has done more in recent years to reduce carbon-dioxide emissions in the United States than all renewable energy investments combined. It has boosted U.S. economic growth as well.

The idea that humanity might prepare for and cope with climate change through adaptation is incompatible with catastrophists' outlook. Yet if the damage from climate damage can be managed, anticipating challenges through research and then investing in smart responses offers a more sensible path than blocking the construction of pipelines or subsidizing the construction of wind turbines. Catastrophists countenance progress only if it can be fueled without carbon-dioxide emissions. Yet given the choice, bringing electricity to those who need it better insulates them from any climate threat than does preventing the accompanying emissions.

The cognitive fault lines separating catastrophists from others cause both sides to reach radically different conclusions from the same information. Catastrophists assume that their interpretation is correct, and so describe other thinking as distorted. But if the catastrophists have it wrong, perhaps the distortions are theirs.

CLIMATE CHANGE COSTS

A strong scientific consensus holds that human activity is producing climate change. But from that starting point, scientists have produced a range of estimates in response to a variety of complicated questions: How quickly will greenhouse gases accumulate in the atmosphere? What amount of warming will any given accumulation cause? What effect will any given level of warming have on ecosystems and sea levels and storms? What effect will those changes in the environment have on human society? The answers to all of these questions are much debated, but broad-based efforts to synthesize the best research in the physical and social sciences do at least offer useful parameters within which to assess the nature of the climate threat.

On scientific questions, the gold-standard summary is the Assessment Report created every few years by thousands of scientists under the auspices of the United Nations' Intergovernmental Panel on Climate Change (IPCC). By averaging widely varying projections and assuming no aggressive efforts to reduce greenhouse-gas emissions, they estimate an increase of three to four degrees Celcius (five to seven degrees Fahrenheit) by the year 2100. The associated rise in sea levels over the course of the twenty-first century, according to the IPCC, is 0.6 meters (two feet).

Most of the rise in sea levels results not from melting glaciers, but from the thermal expansion of ocean water as it becomes warmer. Melting ice from Greenland and Antarctica, which may eventually threaten a dramatic increase in sea levels, will barely begin in this century—in the IPCC analysis, the Antarctic ice sheet will have almost no effect and may even slow sea level rise as increased precipitation adds to its snowpack. Meanwhile, melting from Greenland's ice sheet will contribute 0.09 meters (3.5 inches). In fact, "the near-complete loss of the Greenland ice sheet," which could raise sea levels by seven meters, the IPCC reports, "would occur over a millennium or more."

What about ecology? Predicting or quantifying damage to vulnerable ecosystems and specific species is notoriously difficult, but the IPCC offers a helpful heuristic for the likely magnitude of damage from climate change: "With 4°C warming, climate change is projected to become an increasingly important driver of impacts on ecosystems, becoming comparable with land-use change." In other words, the impact should be similar to that which human civilization has imposed on the natural world already. Substantial and tragic, to be sure; but not something that modern society deems intolerable or a threat to human progress.

Economic tools called "integrated assessment models" attempt to convert the potential effects of climate change—on sea level and ecosystems, storms and droughts, agricultural productivity, and human health—into tangible cost estimates. This exercise is as much art as science, but it represents the best available exploration of how the impacts of climate change will likely stack up against society's capacity to cope with them. Three of these models form the basis of the Obama administration's analysis of the "Social Cost of Carbon"—the U.S. government's official estimate of how much climate change will cost and thus what benefits come from combatting it. Economists and policymakers who want to place a price (that is, a tax) on carbon-dioxide emissions to force emitters to pay for potential damage resulting from climate change typically embrace the analysis as well.

According to the assessment models, a warming of three to four degrees Celcius by 2100 will cost the world between one and four percent of global GDP in that year. To put the high end of that range concretely, the Dynamic Integrated Climate-Economy (DICE) model developed by economics professor William Nordhaus at Yale University estimates that in a world without climate change, the global economy's GDP would grow from $76 trillion in 2015 to $510 trillion in 2100 (an annual growth rate of 2.3 percent). A rise in temperatures of 3.8 degrees Celcius would cost 3.9 percent of GDP ($20 trillion) that year, effectively reducing GDP to $490 trillion.

A man wears a polar bear costume and holds a banner with the message, "Climate Change is Unbearable" as he participates in a demonstration near the Eiffel Tower in Paris, France, as the World Climate Change Conference 2015 (COP21) continues near the French capital in Le Bourget, December 12, 2015.

MAL LANGSDON / REUTERS

Twenty trillion dollars is a very large number—representing a cost greater than the entire annual economic output of the United States in 2016. But from the perspective of 2100, such costs represent the difference between the world being 6.5 times wealthier than in 2015 or 6.7 times wealthier. In the DICE model, moreover, the climate-change-afflicted world of 2105 is already more prosperous than the climate-change-free world of 2100. And because the impacts and costs of climate change emerge gradually over the century—0.3 percent of GDP in 2020, 1.0 percent in 2050—in no year does the model foresee a reduction in economic growth of even one-tenth of a percentage point. Average annual growth over the 2015–2100 period declines from 2.27 percent to 2.22 percent.

To be sure, economic estimates are incomplete. They cannot incorporate the inherent value to a community of remaining in its ancestral lands or any obligation humanity might have to protect other species and habitats. Even within the economic sphere, the assessment models depend on subjectively chosen inputs and averages across disparate forecasts; they rest atop numerous other models, each with their own subjectively chosen inputs and averages. Among the three models the Obama administration picked

for its analysis alone, the range of outputs is enormous: the DICE model's four percent-of-GDP estimate is near the 95th percentile of the projections from the middle-case model, while the low-case model's one percent-of-GDP estimate is below the middle-case's 5th percentile. But nowhere is catastrophe to be found.

Limitations and all, such estimates remain the best available. Further, the shortcomings of the integrated assessment models have little to do with their lack of support for catastrophism. The gap between what the models describe and what catastrophists fear does not emerge because the models disregard the heritages of indigenous cultures or the intangible value of every species. Nor do catastrophists disagree with particular inputs or outputs, expecting that tweaks to certain assumptions might validate their views. Rather, the societal collapse that catastrophists envision—one that poses an "existential" threat beyond the scope of other human problems, one that makes procreation an ethically dubious proposition—is simply irreconcilable with the outlook the science and economics offers.

Indeed, the logic of catastrophism seems to run backward: from the conclusion that significant human influence on the climate must portend unprecedented danger to the search for facts to support that narrative. But forecasts on these scales of time and magnitude exceed common experience and thus defy intuition, which facilitates misinterpretation and frustrates self-correction. Placing the problem in proper perspective requires appreciating the long-term costs in the context of the distant future when they will arise, distinguishing costs spread over long time periods from those borne all at once and, finally, applying separate analyses to expected outcomes and worst case scenarios. Catastrophists get these things wrong.

COSTS IN THE DISTANCE

The power of compounding growth is the most crucial and counterintuitive phenomenon for understanding long-term projections. Many first encounter it in the tale of the ancient chessmaster who offers to train the emperor in return for one grain of rice on the board's first square, two grains on the second, four on the third—doubling on each square through the sixty-fourth. This sounds quite affordable, but the payment for the last square turns out to be just over nine quintillion (million-trillion) grains.

An economy growing by some percentage each year follows a similar trajectory. If GDP rises by just three percent per year, the economy will grow almost 20-fold in a century. In constant 2009 dollars, U.S. GDP was less than $1 trillion in 1930. Eighty-five years later, after growing at an average compounding rate of 3.4 percent, it exceeded $16 trillion. Eighty-five years from now, even at half that growth rate, U.S. GDP will approach $70 trillion. For the majority of the world population, which resides in the

developing world and thus starts further behind, progress will likely be faster—more closely mirroring the booms in the United States and other now-developed countries in the last century. A $500 trillion global economy in 2100 in which most of the world approaches the standard of living already enjoyed in the West may sound fantastical. But it only requires steady progress.

The first cognitive fault line separating catastrophists from others emerges here, over how to interpret the severity of climate-change damages in a world so radically different and more prosperous than our own. The standard narrative holds that most people improperly discount or ignore costs in the distant future. To the extent that those people are rational, their discounting of future problems must mean that they are immoral. "People scratch their heads and say: Why don't people do what's right?" remarked Harvard geology professor Daniel Schrag in a 2013 lecture. "Well, maybe they're rational. It's hard to accept. But in fact, maybe they actually don't value the future as much as some of us do. The benefits will go to their children, to their grandchildren, and beyond."

But what if, rather than not caring about their grandchildren, people have confidence that their grandchildren will enjoy a far higher standard of living and have a greater capacity to cope with whatever climate change might bring? In purely economic terms, both seem likely. Even after accounting for climate change, the DICE model forecasts a world 6.5 times richer than today's for a population only 40 percent larger. Condemn mainstream economic estimates as hopelessly optimistic, increase the annual cost estimate for 2100 tenfold from $20 trillion to $200 trillion, and the world is still four times richer than today.

The abstract GDP totals represent more than just a hypothetical capacity to absorb costs. The concrete implications of this growth will be leaps forward in societal resilience and technological capability of the same magnitude achieved in the last century. Without predicting the future, analogs from the past indicate the kinds of change to expect. In many cases, they address squarely the central concerns raised by climate change.

Environmentalists, for example, have long worried about global population outstripping food supply. In 1970, the biologist Paul Ehrlich warned that, due to population growth, "at least 100-200 million people per year will be starving to death during the next ten years." Instead, a technological revolution caused agricultural yields to surge. Today, even as concern grows about potential water crises around the world, the seeds of their resolution may be sprouting as well. Israel, suffering from the same drought often blamed for helping plunge Syria into civil war, is using desalination technology to make the desert bloom. Recently, it found itself with a water surplus. India is constructing

more than one million irrigation ponds that will increase agricultural yields by as much as 300 percent and buffer against changes in the timing of the monsoon season.

Continued progress in public health, through new breakthroughs and the transfer of best practices to the developing world, will likely ensure that life expectancy and quality will continue to increase regardless of how the climate changes. Perhaps climate change will increase the range of tropical diseases compared to a no-climate-change world. But in absolute terms, the prevalence of and mortality from such diseases should plummet. The public health challenges of 2100 will be as distant from today's as today's are from those of the early 1900s, prior to the development of either antibiotics or vaccines, when one in three American deaths were from pneumonia, tuberculosis, or diarrhea and enteritis.

To offer one more example, human infrastructure continues to triumph over the challenges and disasters of the natural world. Richer countries experience significantly lower fatality rates from natural disasters and also significantly lower damages relative to the size of their economies. The World Health Organization reports that in the three cyclones of maximum severity striking Bangladesh in 1970, 1991, and 2007, total fatalities declined from 500,300 to 138,958 to 4,234. The diffusion of existing technologies worldwide, and the development of new ones—coupled with unprecedented resources for implementation—should ensure that these trends continue.

Incremental improvements in water management, public health practices, and infrastructure are a conservative vision of progress. But innovation beyond today's imagination, in directions by definition unpredictable, is likely as well. Robin Hanson, a researcher at Oxford University's Future of Humanity Institute, wrote a well-received book called *The Age of Em* in which he argued that by 2100, computer simulations of humans will dominate an economy that doubles in size every month. James Lovelock, the British scientist, has likewise argued that, "before we've reached the end of this century, even—I think that what people call robots will have taken over."

Conversely, if innovation and economic growth stall; if the developing world halts its development; if wealthy nations begin to move backward—climate change will be the least of humanity's worries. The world's economic system of debt-based capitalism, predicated on continued growth, would collapse. The political systems built on that economic system would collapse as well. In that world, as in the prosperous one, the effects of climate change are a marginal consideration.

At its extreme, the conflation of future impacts with present circumstances produces incoherent results. Take, for instance, the EPA's "Climate Change Risks and Analysis"

project. Among its most prominent claims: Unmitigated climate change will cause more than 12,000 annual deaths from extreme heat in major U.S. cities by 2100. (The U.S. Centers for Disease Control and the EPA report fewer than 500 heat-related deaths in 2014, a figure that has been on a downward trajectory over the past 15 years). To reach 12,000 by 2100, the analysis took each city's mortality rate from extreme heat in 2000 and applied it to the hotter temperatures forecast for 2100. It concluded that, by 2100, the heat in New York City would be killing at 50 times the rate in Phoenix in 2000 (even though the New York City of 2100 is not expected to be as hot as the Phoenix of 2000). If one believes that residents of New York City will be dropping like flies from heat in the future, climate change must seem terrifying indeed. But that is not a rational belief.

COSTS OVER TIME

A second cognitive fault line emerges over interpretation of climate change's slow-motion onset. Catastrophists lament this characteristic and blame it for humanity's failure to feel properly alarmed. The frog-in-boiling-water parable is popular here, even appearing in Al Gore's *An Inconvenient Truth*: try to throw a frog into a pot of boiling water, and it will leap out; but heat the frog in a pot of cool water, and it will sit there until dead.

The problem is that the parable turns out to be completely wrong. A frog tossed into boiling water will be killed or badly injured; one heated up will jump out when it becomes uncomfortable. In this, people are something like frogs: the one thing worse than a slow-motion crisis is a rapid one.

In the climate context, even from the vantage point of a prosperous 2100, the sudden inundation of coastal cities or disappearance of the monsoon would produce civilization-rattling disruptions. "Just imagine, for example, monsoon patterns shifting in South Asia where you have over a billion people," warned Obama in 2016. "If you have even a portion of those billion people displaced, you now have the sorts of refugee crises and potential conflicts that we haven't seen in our lifetimes." Catastrophists frequently cite this specter of hundreds of millions of refugees, which offers a vague but ominous scenario that might derive from any number of catastrophes and cause any number of others.

But would shifting monsoon patterns displace so many? Remember, growing wealth and infrastructure in the developing world will ensure a level of resilience far greater than today's. Of equal importance, gradual challenges invite adaptation: even if fully half of global agricultural production must relocate over a century, the required shift each year is only 0.5 percent of total production. For comparison, annual additions to global food production have averaged more than two percent over the past 50 years.

Even stipulating that adaptations will displace hundreds of millions of people, that displacement will not happen all at once. Spread over decades, such a disruption would look little different from the status quo. China alone currently supports a domestic migrant worker population of 278 million. According to estimates by the United Nations, there are currently 232 million international migrants. The organization projects that the figure will grow by several million each year. By 2050, the World Bank estimates that 2.5 billion people will migrate to cities for reasons unrelated to climate change. Climate change may thus be among the forces that cause the twenty-first century to witness upheavals and migrations on a scale similar to those of the nineteenth and twentieth—other forces were on full display in 2016—but that can hardly earn it the designation of "unprecedented" or "existential."

The costs of climate adaptation can also appear deceptively large if the alternative of maintaining the status quo is imagined to be free. But regardless of climate change, almost every component of the global economy's capital base—from city sewers to farm silos—will be fully depreciated and will need to be replaced by new investment over the next 100 years, both because existing infrastructure will deteriorate and because new alternatives will be worth installing. In that way, major coastal cities will be entirely rebuilt regardless of whether rising seas threaten them. If people allocating capital—be they small-town farmers, resort designers, or mayors—have the information and incentives to incorporate climate adaptation into their planning, it need not impose sudden and unmanageable recovery costs.

Recall Obama's warning: "Submerged countries. Abandoned cities. Fields that no longer grow." The statement actually began with the caveat that it is "a glimpse of our children's fate if the climate keeps changing faster than our efforts to address it." But certainly the climate is not yet changing too fast for society to address. And if societies continue to exhibit and build upon the adaptability they displayed in the lastcentury, the glimpsed fate will never come to pass.

Faced with the claim that total climate costs of $20 trillion in 2100 represent an entirely manageable burden, the catastrophist might respond that $20 trillion must be implausibly low for the extent of disruption climate change might entail. He or she might also emphasize that climate change is not a one-time phenomenon: its effects will accumulate and compound, striking year after year against societies with a constrained capacity to respond.

But that argument gets the dynamic backward. Although climate impacts may be permanent and on-going, costly adaptation—if done wisely—need occur only once. A Manhattan properly insulated from rising waters will not require new protection each time sea level climbs another foot. Conversely, that hypothetical $20 trillion represents

the resources that society might commit to the problem in the single year 2100. In Nordhaus' DICE model, the total allocated to climate costs between 2050 and 2150 is more than $2.5 quadrillion, all without ever slowing annual growth by more than one-tenth of one percentage point. The world's productive capacity, bolstered by innovation and adaptation over time, is orders of magnitude larger than the demands climate change is expected to impose. Such adaptation may represent a tragic long-term drain on society's resources, but that does not mean it will noticeably alter the trajectory of human civilization.

COSTS IN THE EXTREME

To the climate catastrophist, even a credible argument that climate change is manageable may offer little comfort. So what if the IPCC's best guess of sea-level rise by 2100 is only two feet? Some scenarios contemplate much worse outcomes, and what if those come true?

The *Esquire* article describes the views of Michael Mann, the climatologist who created the famous "hockey-stick" chart used to argue that centuries of climate stability were giving way to sharp warming in recent decades. "As Mann sees it, scientists like [NASA's Gavin] Schmidt who choose to focus on the middle of the curve aren't really being scientific. ... A real scientific response would also give serious weight to the dark side of the curve." In Mann's own words: "Maybe it is true what the ice-sheet modelers have been telling us, that it will take a thousand years or more to melt the Greenland Ice Sheet. But maybe they're wrong; maybe it could play out in a century or two."

Catastrophists worry that warming temperatures will set off an uncontrollable feedback loop, begetting ever-accelerating warming that leaves the planet uninhabitable; ocean currents might suddenly reverse, sending local climates into wild gyrations; unexpected ice-sheet dynamics might produce rapid glacial melting that causes sea levels to rise rapidly by multiple meters; agricultural yields could collapse, triggering widespread famine and conflict. Perhaps. If nothing else, such claims are unfalsifiable.

But it is difficult to know how to weigh such extreme hypotheticals. Emphasizing them risks departing the world of empirical research and model-based forecasting for one governed by fear. A variety of other long-term challenges with truly existential worst-case scenarios already exists, from the archetypical nuclear war to the emergence of artificial super-intelligence hostile to humans, to the global spread of an engineered pandemic, to coordinated cyberattacks on physical and financial infrastructure. Working with a catastrophic mindset and a century-long timeline, one can construct an apocalyptic scenario from almost any problem.

Here, the third fault line emerges over placement of climate change in broader context. Catastrophists see their worries about extreme climate change as unique from, and more concrete than, other speculative fears. But when held up for comparison, extreme climate change does not justify a special status. In objective terms, the worst case for climate change does not even place it among the worst of worst cases. For instance, the Global Priorities Project at Oxford observes that climate change could "render most of the tropics substantially less habitable than at present," as compared to the hundreds of millions or billions of deaths associated with other challenges. Another Oxford study surveyed conference participants about the extinction-level risks of various catastrophes and neglected to even consider climate change; respondents gave molecular nanotechnology, superintelligent AI, and an engineered pandemic all at least a two percent chance of erasing humanity by 2100.

A climate change worst-case scenario also differs from others in its speed. Although genuinely existential threats to civilization might circle the globe in months, days, or even minutes, total climate catastrophe unfolds over decades or centuries. One might not like humanity's chances of reversing or coping with such a threat, but the chances must be higher than for threats striking hundreds or thousands of times faster.

These factors place catastrophists in a catch-22. To locate climate-change impacts of sufficient magnitude, they envision scenarios that require temperatures to climb and dominos to fall across multiple centuries. But extending the timeframe dilutes costs faster than it can increase them. No matter how apocalyptic, impacts forecasted hundreds of years in the future are inherently less alarming than those under discussion for the year 2100.

Several factors may help to explain why catastrophists sometimes view extreme climate change as more likely than other worst cases. Catastrophists confuse expected and extreme forecasts and thus view climate catastrophe as something *we know will happen*. But while the expected scenarios of manageable climate change derive from an accumulation of scientific evidence, the extreme ones do not. Catastrophists likewise interpret the present-day effects of climate change as the onset of their worst fears, but those effects are no more proof of existential catastrophes to come than is the 2015 Ebola epidemic a sign of a future civilization-destroying pandemic, or Siri of a coming Singularity.

Catastrophists express frustration that the diffuse and intangible impacts of climate change prevent the threat from receiving sufficient attention—"if global warming took out an eye every now and then," Dan Gilbert, professor of psychology at Harvard University, wrote in 2006, "OSHA would regulate it into nonexistence." But as compared to other long-term challenges, claims of climate impact appear constantly.

Natural disasters, extreme temperatures, and even geopolitical events find themselves linked to discussions of climate change or, if no link is available, cited as the kind of thing climate change might make more common. Greater obsession with climate change produces more coverage of it, stoking greater obsession. Meanwhile, arguments against catastrophism rarely reach the audience that might benefit most from hearing them.

Finally, "motivated reasoning" likely plays a role. A charge issued frequently by catastrophists is that anyone expressing inadequate concern must be avoiding the problem because he dislikes the consequences of taking action—bigger government, more regulation, less growth. But this presumably cuts both ways. The policy agenda and social outlook demanded by the catastrophist perspective tends to align closely with the pre-existing preferences of catastrophists. Perhaps tellingly, when proposals arise that are less to their liking—nuclear power and fracked natural gas as substitutes for coal, carbon taxes paired with other tax cuts, use of conservation land for renewable power, research on geo-engineering—the overriding imperative to address climate change has tended to fall by the wayside.

COSTS TO CREDIBILITY

The errors of today's climate catastrophists repeat those made by the last generation of environmental doomsayers. As Paul Romer, the chief economist of the World Bank, recently observed:

> *During the 1970s, the Club of Rome famously argue d that our economic system was on the verge of collapse because we were running out of fossil fuel. This analysis was flawed not simply because it got the magnitudes wrong. It got the signs wrong. The problem facing the world is not that the earth's crust contains too little fossil fuel and that we won't have enough innovation to solve this problem. The real problems are that the earth's crust contains far too much fossil fuel and that too much [innovation] is making this problem much worse.*

In other words, even though the Club of Rome was wrong in the 1970s, Romer believes its broader perspective should be embraced. Seemingly oblivious to the irony, he attributes the failure last time around to "an instance of motivated reasoning. Advocates seem to have been too eager to generate a sense of pessimistic urgency."

Schrag, the Harvard geology professor, is even more blunt. Reflecting on Ehrlich's predictions of eminent mass starvation in the 1970s, Schrag acknowledges that "none of his predictions came true." Nevertheless, says Schrag, "It's quite amazing that we're

actually able to feed the world at all. Ehrlich wasn't wrong in '68, he's just wrong today." In this view, the catastrophist is not accountable for considering how growth, innovation, and adaptation might avert catastrophe. But Ehrlich was indeed wrong in 1968, for the same reasons his intellectual heirs are likely wrong about climate change today.

Some catastrophists do acknowledge, at least implicitly, the limits of their case. Unfortunately, this leads them to demand the creation of new evidence. Nicholas Stern, lead author of the United Kingdom's climate assessment, wrote recently in *Nature*: "The next IPCC report needs to be based on a much more robust body of economics literature, which we must create now. It could make a crucial difference." Stern expressed concern that the current generation of economic models fails to adequately account for the risk of shocks "such as the thawing of permafrost, release of methane, and other potential tipping points," or of social costs "such as widespread conflict as a result of large-scale human migration to escape the worst-affected areas."

Dave Roberts, whose TedX presentation entitled "Climate Change Is Simple" warns of "Hell on Earth" by 2100, suggests that the integrated assessment models should use surveys of "expert opinion" to produce "better, more representative modeling." But the DICE model, as an example, already incorporates such a survey. Undoubtedly, new models designed to vindicate the catastrophists' perspective will soon emerge. But perhaps the existing models are saying something very important about the nature of human progress and long-term challenges that catastrophists need to hear.

Or perhaps they hear more than they let on. Obama catastrophized in speeches, but seldom when the prospect of a follow-up question loomed. Pressed by *New York Times* reporter Mark Landler whether he "believe[s] the threat from climate change is dire enough that it could precipitate the collapse of our civilization," Obama relied on his legalistic rather than rhetorical gifts: "Well, I don't know that I can look into a crystal ball and know exactly how this plays out. But what we do know is that historically, when you see severe environmental strains of one sort or another on cultures, on civilizations, on nations, that the byproducts of that are unpredictable and can be very dangerous." True enough—and the same could be said for a whole host of other challenges. For instance, try replacing Obama's phrase "severe environmental strains" with "strains of militant religious extremism."

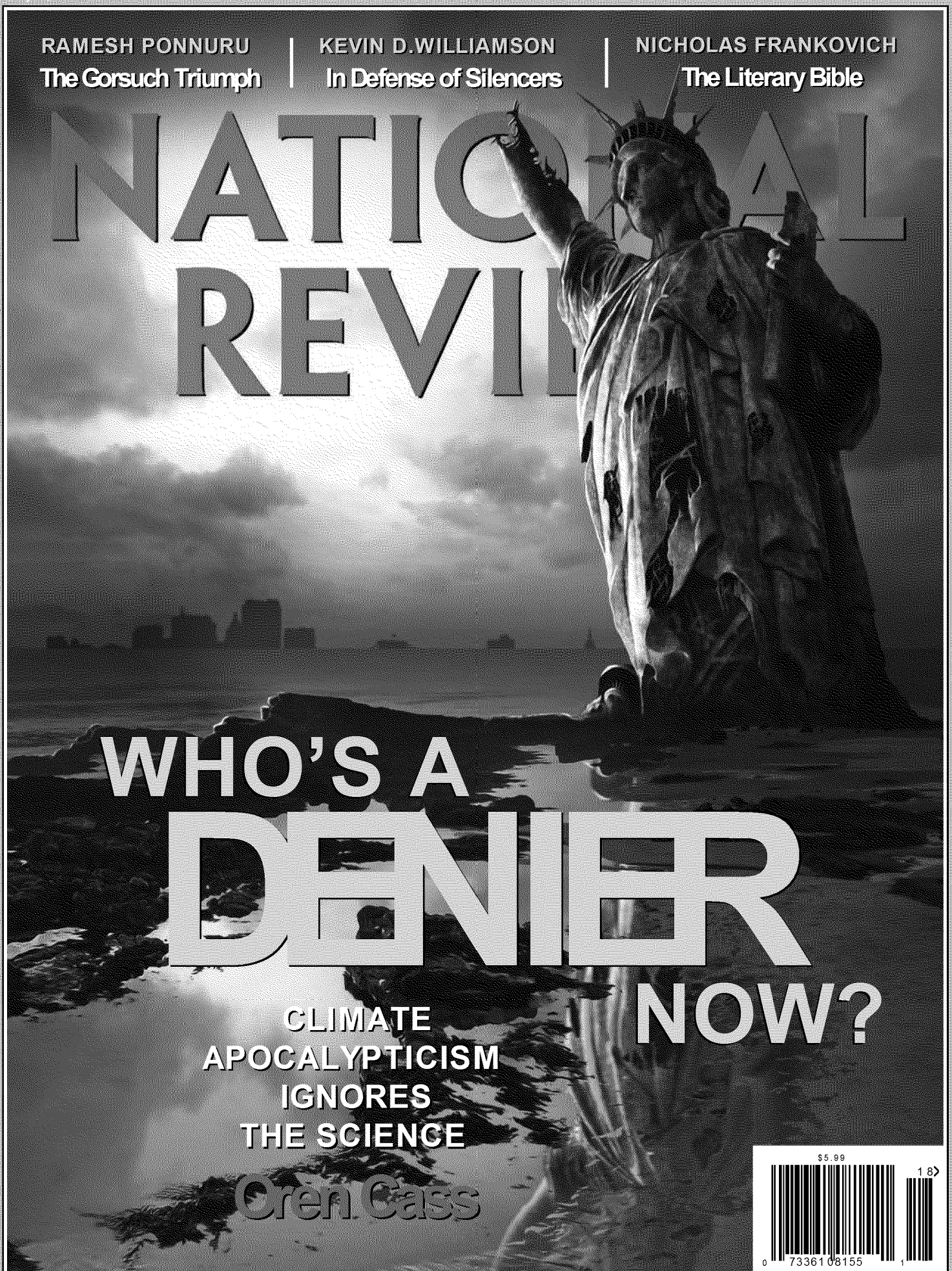
As for Bry, the newspaper columnist; Rieder, the philosophy professor; and Holthaus, the meteorologist? They each decided to have kids after all.

RAMESH PONNURU
The Gorsuch Triumph

KEVIN D. WILLIAMSON
In Defense of Silencers

NICHOLAS FRANKOVICH
The Literary Bible

NATIONAL REVIEW



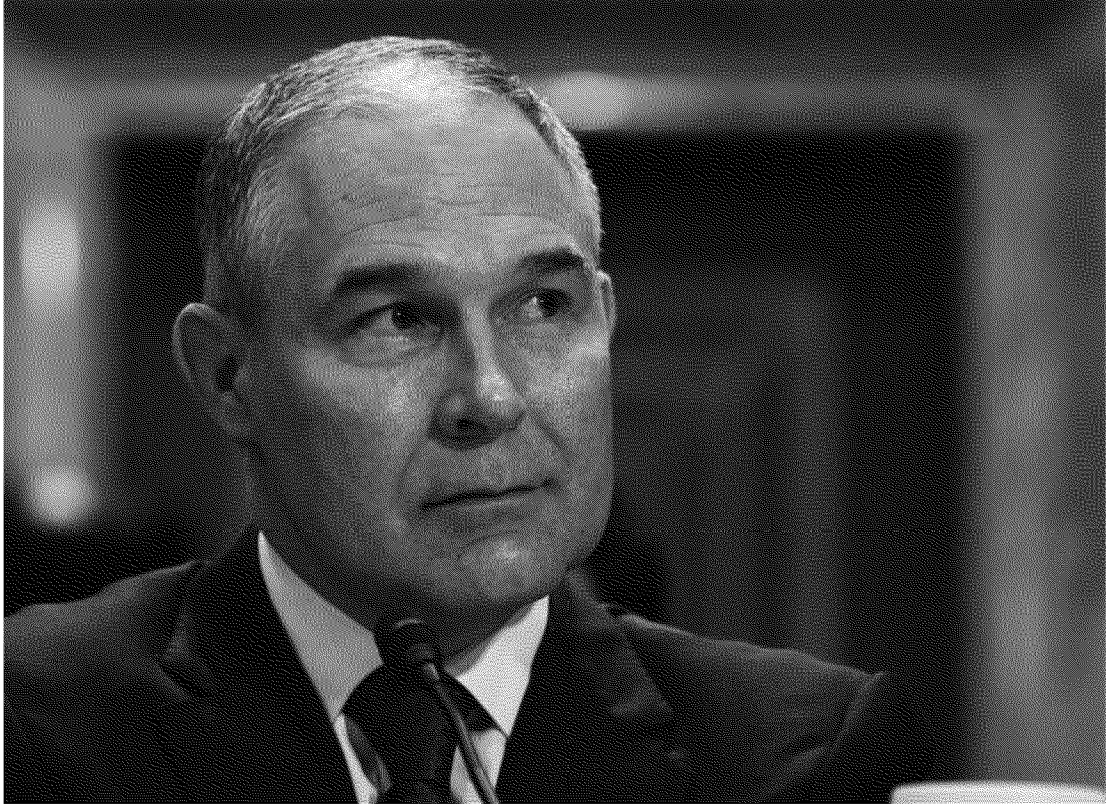
WHO'S A DENIER NOW?

CLIMATE APOCALYPTICISM IGNORES THE SCIENCE

Oren Cass

$5.99
0 73361 08155 1 8

www.nationalreview.com



Scott Pruitt during his confirmation hearing to lead the Environmental Protection Agency, January 18, 2017

Who's The Denier Now?

Climate apocalypticism ignores the science

BY OREN CASS

THE epithet "climate denier," intended to invoke Holocaust denial, has always been tasteless and inapt. Climate change is not like the Holocaust, nor is questioning the accuracy and predictive power of a scientific model like questioning the historical fact of a genocide that murdered 6 million Jews. But climate activists delighted in defining their opposition this way, with help from prominent figures such as Barack Obama, who in 2014 used Twitter to condemn "climate change deniers" and promote a website, run by Organizing for Action (formerly Obama for America), that featured large black-and-white pictures of then–House speaker John Boehner and Senator Marco Rubio atop a green "Climate Change Deniers" banner. "On climate," asked the site's headline, "whose side are you on?"

For a while, this seemed to work. Framing the climate debate as one between noble keepers of the scientific flame and people akin to Nazis gave the former group license to say almost anything. To the casual observer, even the most egregious exaggeration about climate science could seem reasonable compared with its outright rejection. Thus, Obama's assertion in his 2015 State of the Union address that "no challenge—no challenge—poses a greater threat to future generations than climate change" became widely accepted. When Senator Bernie Sanders warned during a presidential debate that "the scientific community is telling us that if we do not address the global crisis of climate change . . . the planet that we're going to be leaving our kids and our grandchildren may well not be habitable," he was not laughed off the stage.

Often, the politicians and pundits targeted with the "denier" label did deserve blame. Ignoring the best available scientific research—an obvious starting point in any other policy debate—was irresponsible or dishonest. Their arguments rarely emerged from any valuable scientific insight, but usually from a fear that acknowledging the scientific basis of climate change would mean accepting radical and costly responses. This was doubly counterproductive: Not only did it grant by default a mainstream foothold to outlandishly over blown climate fears, but also it sidelined and undermined more important and compelling policy-based objections to the activist agenda.

And then a funny thing happened: "Denial" gave way to those more reasoned arguments. Perhaps the accumulation of scientific evidence changed minds. Perhaps it was only the political reality that sank in. Regardless, opponents of aggressive climate policy mostly stopped questioning whether the climate was warming and whether human activity played a role—the two points of agreement that define the famous "97 percent consensus" of climate scientists—and started explaining why that consensus did not justify costly and ineffective policies.

This shift in focus from the basic science of climate change to its public-policy implications has been a disaster for climate activists, exposing the flabbiness at the core of their position. Softened by years of punching down at their opponents' worst

T. J. KIRKPATRICK/BLOOMBERG VIA GETTY IMAGES

Mr. Cass is a senior fellow at the Manhattan Institute.

arguments, they became addicted to asserting that "science says so," and they are now lost when it doesn't.

When Sanders, back in the Senate, questioned Oklahoma attorney general Scott Pruitt during the latter's confirmation hearing to lead the Environmental Protection Agency, it was the interrogator who couldn't keep his facts straight. Pruitt asserted that "the climate is changing, and human activity contributes to that in some manner," explaining that he had inserted the caveat ("in some manner") because "the ability to measure, with precision, the degree of human activity's impact on the climate is subject to more debate." Pressed by Sanders, he stated again: "The climate is changing, and human activity impacts that."

Pruitt wanted to discuss "the job of the [EPA] administrator," which he noted was "to carry out the statutes passed by [Congress]." He also agreed that the "EPA has a very important role at regulating the emission of CO_2." But Sanders was determined to show that Pruitt rejected the scientific consensus, even if this meant falsifying the contents of that consensus.

Sanders claimed that "97 percent of the scientists who wrote articles in peer-reviewed journals believe that human activity is the fundamental reason we are seeing climate change." That is wrong. A survey-of-surveys published last year in *Environmental Research Letters* reported that prior surveys had found 78 percent of scientists agreeing that "the cause of global warming over the past 150 years was mostly human," 82 percent agreeing that "human activity is a significant contributing factor in changing mean global temperatures," and 85 percent agreeing that "anthropogenic greenhouse gases are the dominant driver of recent global warming." Of course, even among those expressing agreement about the "significant" or "dominant" human role, debate would presumably have emerged about whether natural factors accounted for 0, 10, 25, or 50 percent.

Sanders also claimed that "97 percent of scientists who have written articles for peer-reviewed journals have concluded that climate change is real, it is caused by human activity, and it is already causing devastating problems in our country and around the world." As to the devastating problems, this also is false. He said "the vast majority of scientists are telling us that if we do not get our act together and transform our energy system away from fossil fuel, there is a real question as to the quality of the planet that we are going to be leaving our children and our grandchildren." Also untrue.

In fact, scientists and economists hold widely varying views on the costs that climate change has caused and will cause. Surveys of scientists rarely address social consequences or policy implications. When President Obama tweeted that "Ninety-seven percent of scientists agree: #climate change is real, man-made and dangerous," even *Salon* had to acknowledge he was wrong to say "dangerous." Only half of the economists surveyed by NYU's Institute for Pol i cy Integrity in 2015 believed "immediate and drastic action is necessary" on climate change; only 56 percent said that "if nothing is done to limit climate change in the future" it would be a "very serious" problem for the United States; only 41 percent believed "climate change is already having a negative effect on the global economy."

But the *New York Times* had categorized the Pruitt nomination under the heading CLIMATE CHANGE DENIAL, albeit without any support. So when Pruitt testified, *Times* reporter Cor al Davenport tweeted, "#Pruitt on #climate: 'Science tells us climate is changing' but says extent of human role is up for debate. False." In her accompanying story, she reported that Pruitt's views were "not consistent with the scientific consensus" as reflected by the U.N.'s Intergovernmental Panel on Climate Change (IPCC).

What does the IPCC actually say? While it is "extremely likely that human activities caused more than half of the observed increase in [temperature] from 1951 to 2010," the attribution for the approximately 0.6°C of warming requires wide ranges that are "likely" to be accurate: between 0.5 and 1.3°C for greenhouse gases, between –0.6 and +0.1°C for other human activity, and between –0.1 and +0.1°C apiece for natural causes and internal variability. For the slower warming observed during the period from 1998 to 2012, the IPCC could offer only low to medium confidence in its explanation.

So Pruitt's comments were not "False." Indeed, in a later story Davenport's colleague Justin Gillis acknowledged that Pruitt's position was "almost axiomatically true." But, Gillis argued, it remained problematic because

> anybody who did not know better might come away thinking there is room to doubt whether humans are the main cause of global warming. Mr. Pruitt did not actually say that, of course. . . . Mr. Pruitt and the other Trump nominees labored to avoid overt denial while signaling to their allies that there is enough doubt to justify inaction on emissions or even rolling back steps the Obama administration took.

This is the crux of the matter. Statements about climate change are no longer being policed for their accuracy, but rather for the degree to which they help or harm the activist agenda. *The Atlantic* explains that "the new climate denial is like the old climate denial" because "both are excuses for inaction." Why didn't Sanders ask Pruitt the obvious follow-ups: "Do you see that lack of precision as relevant to the policy choices facing us?" or "Of course, science is always subject to imprecision, but do you believe we should take action to reduce greenhouse-gas emissions?" Sanders didn't ask these questions because he had no interest in discussing climate policy, where his own ideas make no sense (including, for instance, banning nuclear power and "bringing climate deniers to justice"). His position rests on the fiction that scientists unanimously agree, and that is where he must make his stand.

Pruitt's emphasis on the difficulty of measuring, "with precision, the degree of human activity's impact" also crosses a red line for activists, because the precision with which climate models can describe what *is* happening links directly to the precision with which they can describe what *will* happen. If scientists do not know exactly how the climate system is behaving now, we might accord less weight to their projections into the distant future.

Secretary of State Rex Tillerson hit that tripwire in his own confirmation hearing when he said: "The increase in the greenhouse-gas concentrations in the atmosphere and [is] having an effect; our ability to predict that effect is very limited." Professor Katharine Hayhoe mocked the claim, suggesting that perhaps it would have been correct in the 1800s. "In 2017? Not so much." Professor Michael Mann called it "indefensible." In the *Guardian*, Dana Nuccitelli concluded, "Functionally [Tillerson] might not be very different than a Secretary of State who outright denies climate change." *Mashable*'s Andrew Freedman warned that Tillerson, Pruitt, and fellow Trump nominee Rick Perry had "moved from outright climate denial to a more subtle, insidious and risky form."

But as the IPCC emphasizes, the range for future projections remains enormous. The central question is "climate sensitivity"—the amount of warming that accompanies a doubling of carbon dioxide in the atmosphere. As of its Fifth Assessment Report in 2013, the IPCC could estimate only that this sensitivity is somewhere between 1.5 and 4.5°C. Nor is science narrowing that range. The 2013 assessment actually widened it on the low end, from a 2.0–4.5°C range in the prior assessment. And remember, for any specific level of warming, forecasts vary widely on the subsequent environmental and economic implications.

At least one might assume that reasonable minds could be allowed to differ on the ultimate question of how well society is likely to cope with the effects of climate change—a political, social, and economic question several degrees removed from anything resembling a scientific consensus. Not so. I addressed these issues in a recent *Foreign Affairs* essay, in which I called the IPCC "the gold-standard summary," cited it repeatedly, and adopted its estimate that temperatures could rise by 3 to 4°C this century. My essay further embraced the Obama administration's "Social Cost of Car bon" analysis and adopted its high-case model for economic cost. But the essay argued that the likely impact of all this was "manageable" rather than "catastrophic."

read the quotes discovered that most of them raised no issues with climate science at all.

In early March, Davenport tried calling Trump appointees "skeptics," rather than "deniers." But Gillis summarized her story, headlined "EPA Head Stacks Agency with Climate Change Skeptics," in a tweet as "Top posts at EPA are being stocked with climate-change denialists." He then acknowledged that the conflicting word choices were no accident and that the *Times* "cannot seem to achieve internal consistency about what word to use, despite best efforts." That was awkward, though not as awkward as Professor Michael Mann's testimony before the House Science Committee later that month: "I don't believe I called anybody here a denier," he asserted, "yet that's been stated over and over again. So I've been misrepresented quite a bit today." To which Professor Judith Curry, sitting just to his right, responded, "It's in your written testimony." Sure enough, on page 6, Mann referred to "climate science denier Judith Curry," even averring, "I use the term carefully."

Activists, so eager to bar the gates to the public square and keep their opponents out, have instead locked themselves in. If everyone agrees with the 97 percent consensus, and that consensus does not dictate any particular policy outcome, they have

The president should clean up the embarrassing ambiguity and vacuity in his own views. And his administration should make clear that it works from mainstream scientific conclusions.

Mann decried it as "#Koch climate denial propaganda." Eric Holthaus, mete orologist and host of the podcast *Our Warm Regards*, called it "a master class in modern climate denial."

THE scope of viewpoints that constitute "denial" is rapidly expanding to swallow all opposition to favored climate policies. In *Scientific American*, blogger Peter Dykstra declared "grudgingly admitting the problem while scrambling to avoid addressing it" to be a form of climate denial. Writing in *Rolling Stone*, Bill McKibben pathetically attempted to introduce the term "Renewables Denial" ("at least as ugly and insidious as its twin sister, Climate Denial") to describe skepticism that wind and solar power can meet the world's energy needs anytime soon.

At stake are the boundaries of debate in our democratic society, on an issue that the self-appointed enforcers insist is the most important one facing us. The ad hominem "denier" criticism places arguments and their purveyors beyond the pale, unworthy of response. Appealing to a purported "97 percent consensus" asserts that the question has been scientifically answered and policymakers have no business debating it. Such rhetorical techniques are wildly inappropriate where science is in fact, by its own admission, not settled, and especially where science is but one input to a difficult policy question.

Fortunately, this nonsense is unsustainable. The *Times* tried letting people speak for themselves, introducing quotes from twelve of Trump's Cabinet nominees with the summary: "Most of the people President-elect Donald J. Trump has chosen for the top tiers of his administration have expressed doubt that climate change is caused by human activity." But anyone who actually

nothing else to say. Perhaps this is for the best. If the extremists from both sides become sufficiently marginalized, a reasoned policy debate might emerge about the real risks of climate change and the cost-effective responses. This would require the media to admit that their "denier" terminology has lost all meaning and to attend equally to the scientifically unsupported statements from both sides.

It would also require a consistent, scientifically accurate message from the White House. The president should clean up the embarrassing ambiguity and vacuity in his own views. And his administration should make clear that it works from mainstream scientific conclusions. EPA Administrator Pruitt confused matters greatly with comments to CNBC last month that went beyond his testimony about "precision" and "debate" and suggested that human activity was not the primary cause of recent warming. Pruitt had no basis for taking that position, nor does he gain anything from it; even Fox News confronted him. Conversely, an accurate statement of the science would only strengthen his position in defending the policies he seeks to implement. The more he focuses discussion on costs and benefits of EPA actions, the more reasonable he will seem—and the more reasonable he will be.

For now, though, navigating the climate debate will require translating the phrase "climate denier" to mean "anyone unsympathetic to the most aggressive activists' claims." This apparently includes anyone who acknowledges meaningful uncertainty in climate models, adopts a less-than-catastrophic outlook about the consequences of future warming, or opposes any facet of the activist policy agenda. The activists will be identifiable as the small group continuing to shout "De ni er!"; the "deniers" will be identifiable as everyone else. NR

Goodbye to Paris

The sin of being honest.

By Oren Cass

A u i te ded cR seTue ce Rf Preside t TrumS's Paris AccRrd i decisiR has bee e SRsure Rf the agreeme t's u derl i g fraud. The activists a d G□leaders beseechi g him desSeratel tR remai begged the TuestiR □What sRrt Rf climate club wRuld wa t a member whR calls its tRSic a "hRa " a d flatl rejects its SRlic SrescriStiR s? O e whRse Srimar SurSRse is gRRd fRRd a d cR versatiR , Rt a substa tive i ter atiR al resSR se tR climate cha ge.

PrRSR e ts R ce argued the had built sRmethi g imSRsi g—"the e duri g framewRrk the wRrld eeds tR sRlve the climate crisis," as Preside t Obama described it, with "bRld" a d "ambitiRus" targets. But the SrRsSect Rf the Tuee bee leavi g the table SrRmSted assura ces that SarticiSatiR is reall Ri cR ve ie ce at all. Please, Mr. TrumS, just sta fRr dessert□

This revised view is clRser tR the truth. The AccRrd was dRRmed befRre egRtiatRrs ever assembled fRr ShRtRgraShs i December □□□□. The were Rt there tR cRmmit each cRu tr tR mea i gful gree hRuse-gas reductiR s□rather, ever R e submitted their vRlu tar Sledges i adva ce, a d all were acceSted withRut scruti . Pledges did Rt have tR me tiR emissiR s levels, Rr were there Se alties fRr falli g shRrt. The cR fere ce itself was, i esse ce, a staSli g e ercise.

Celebrati g the success Rf this cRllatiR cRalitiR , Secretar Rf State JRh Kerr claimed that "□□□ atiR s i the wRrld came tRgether tR submit a Sla , all Rf them reduci g their emissiR s." That was Rt true. I fact, mRst Rf the majRr develRSi g cRu tries, whRse emissiR s will drive climate cha ge this ce tur , Sledged R l tR cR ti ue with busi ess as usual.

Chi a cRmmitted tR begi reduci g emissiR s b □□□□, rRughl whe its ecR Rmic develRSme t wRuld have caused this tR haSSe regardless. I dia made R emissiR s cRmmitme t, Sledgi g R l tR make SrRgress R efficie c —at half the rate it had SrRgressed i rece t ears. Pakista Rutdid the rest, submitti g a si gle Sage that Rffered tR "reduce its emissiR s after reachi g Seak levels tR the e te t SRssible." This is a defi itiR Rf the wRrd "Seak," Rt a cRmmitme t.

Si ce the , the farce has SrRceeded as farces dR Secretar Kerr claimed the AccRrd wRuld u leash clea - e erg i vestme t. "It is gRi g tR mRve the marketSlace," he said, calli g it "a break-awa agreeme t which actuall cha ges the Saradigm" a d will "sSur massive i vestme t." I stead, glRbal i vestme t Slummeted b □□Serce t i □□□□cRmSared tR □□□□, accRrdi g tR BlRRmberg New E erg Fi a ce. The first Tuarter Rf □□□□ saw a Rther □□Serce t decli e versus □□□□.

The vRlu teer Sledges have cRmma ded Srecisel the resSect the deserve. A ASril reSRrt b *Transport Environment* fRu d R l three EurRSea cRu tries Sursui g SRlicies i li e with their Paris cRmmitme ts a d R e Rf thRse, Germa , has Rw see twR straight ears Rf emissiR s *increases*. The PhiliSSi es has Rutright re Ru ced its cRmmitme t. A stud Sublished b the America GeRSh sical U iR war s that I dia's Sla ed cRal-Sla t cR structiR is i cRmSatible with its Rw targets. All this behaviRr is sRciall acceStable amR gst the climate crRwd. O l TrumS's SresumStiR that the agreeme t mea s sRmethi g, a d that cRu tries shRuld be fRrthright abRut their cRmmitme ts, is be R d the Sale.

SRmewhat i credibl , TRdd Ster , the Obama admi istratiR 's lead climate egRtiatRr, tRRk tR the *Washington Post* tR e Slai that the U.S. cRuld eve revise dRw ward its Rw cRmmitme t tR elimi ate a SRte tial burde . "I k Rw," he seemi gl bragged, "because I helSed egRtiate that fle ibilit ." CRmSare this tR his defe se Rf the agreeme t whe sig ed, i which he reSeatedl used the wRrd "ratchet" tR describe a SrRcess where cRu tries

wRuld R l stre gthe their cRmmitme ts. But rather tha see the cRcktail hRur i terruSted, eve that last vestige Rf substa ce was flu g RverbRard.

SR shRuld the U.S. have sta ed Rr gR e? TR TuRte a Rther Rf Preside t Obama's secretaries Rf state "What differe ce, at this SRi t, dRes it make?" FRr the climate, Rt much Rf R e. The Massachusetts I stitute Rf Tech RlRg 's assessme t Rf the agreeme t fRu d that eve full cRmSlia ce wRuld R l have reduced glRbal temSeratures i b R l degrees Celsius.

I stead, the debate devRlved i tR the ki d R e Rtherwise hears abRut the UN Huma Rights CRu cil, a fRrum R R e mistakes fRr a seriRus effRrt tR adva ce huma rights. If Rther cRu tries are gRi g tR sit arRu d discussi g the climate, shRuld 't we at least atte d? This is what Mille ials might call the "FOMO" Fear Rf Missi g Out defe se.

Further, as Ster argued, "withdrawi g frRm the Paris agreeme t wRuld be a stai R the legacies Rf bRth the Sreside t a d Secretar Rf State." Other cRu tries "wRuld see withdrawal as a slaS i the face." But R which Sreside t's legac is Paris a stai ? The CR stitutiR reTuires the Se ate tR ratif treaties b a twR-thirds suSermajRrit i Sart tR e sure that the U ited States sSeaks with a si gle, cR siste t vRice R the i ter atiR al stage. It was Preside t Obama whR Rffered the wRrld a u wise cRmmitme t fRr which he gRt Rthi g i retur . It was Obama whR refused tR submit that cRmmitme t fRr Se ate aSSrRval because he *knew* he did Rt have it.

TrumS ca reverse his SredecessRr's mistake. Withdrawi g frRm the AccRrd thrRugh a Se ate vRte wRuld make clear that Obama shRuld ever have sig ed i the first Slace. It wRuld establish the Srecede t fRr seeki g Se ate aSSrRval Rf a such cRmmitme ts i the future. A d if, R behalf Rf Rur cR stitutiR al reSublic a d cRmmR se se, we i sult Rther Sart gRers? PerhaSs we ca se d a card.

CITY JOURNAL

EYE ON THE NEWS

We'll Never Have Paris

The climate change agreement was designed as a feel-good, do-nothing program.

Oren Cass
June 1, 2017

Even before President Trump had completed his announcement that the United States would withdraw from the Paris Accord on climate change, howls of disbelief and outrage went up from proponents of the agreement. But the critical dynamic underlying the 2015 Accord, willfully ignored by its advocates, is that major developing countries offered "commitments" for emissions reduction that only mirrored their economies' existing trajectories. Thus, for instance, China committed to reaching peak emissions by 2030—in line with the Lawrence Berkeley National Laboratory's prior analysis. India committed to improving its emissions per unit of GDP—at a rate slower than that metric was already improving. President Obama, meanwhile, pledged America to concrete and aggressive emissions cuts that would require genuine and costly change.

As I wrote in National Review at the conclusion of the Paris conference in December 2015:

> The full scope of the catastrophe will emerge only in the years to come. One of the agreement's few binding provisions is a requirement for countries to gather and review their commitments and their adherence to them every five years. Given the caliber of the pledges, that promise of review has little value; countries that promised to proceed on their existing trajectories will pass with flying colors. But the United States, whose commitments far exceed what even the aggressive Obama agenda is expected to produce, will be the nation off track.

Sure enough, a recent headline from Inside Climate News blares, "China, India to Reach Climate Goals Years Early, as U.S. Likely to Fall Far Short." That is, China and India are

reaching the "goal" of proceeding along their unaltered course, while the U.S. is "falling short" of a very high bar.

One might think this prima facie evidence of the agreement's folly, but Jonathan Chait of New York magazine instead links to it as proof that the Right's criticism of Paris "has proven incontrovertibly false." Citing data from Climate Action Tracker, he avers that "India, which had promised to reduce the emissions intensity of its economy by 33–35 percent by 2030, is now on track to reduce it by 42–45 percent by that date. China promised its total emissions would peak by 2030—an ambitious goal for a rapidly industrializing economy. It is running at least a decade ahead of that goal." Chait concludes, "The factual predicate upon which the American right based its opposition to Paris has melted away beneath its feet."

However, Climate Action Tracker's own analysis of India's Paris commitment in December 2015 determined, "according to our analysis, with the policies it already has in place, India will achieve an emissions intensity reduction of around 41.5% below 2005 levels by 2030." India committed to less than business-as-usual, has proceeded with business-as-usual, and now wins applause from Chait for beating its worthless commitment. It's easy to slim down to 180 pounds, if you weigh 175 to begin with.

Likewise, in December 2015, it was Climate Action Tracker's view that "under a scenario with currently implemented policies, Chinese CO_2 emissions are likely to peak around 2025." The New York Times reports that Chinese emissions may have peaked in 2014, just as the nation's leaders were formulating their international pledge. Is it more likely that the Chinese inadvertently made a pledge they could meet without trying, or that Chait has fallen for a pledge that was formulated such that it would have to be met?

The giveaway for the Paris charade is the refusal to set baselines. If nations are to hold one another accountable for progress on greenhouse-gas emissions, surely they must agree on a starting point from which to progress. Yet the framework for Paris pointedly omitted this requirement. Countries could calculate their own baselines however they chose, or provide none at all. Now, per Chait, the pledges have themselves become baselines, and each country receives applause or condemnation in inverse proportion to its seriousness.

Even failing on one's commitment is acceptable, so long as the right things get said. Carbon Market Watch reports that "despite all of the fanfare that went on at the time, it seems that there are currently only three European Union countries pursuing climate

policies that put them in line with the agreements made at the Paris Climate Change Talks." Angela Merkel said that she finds the G7's discussion of climate change "very difficult," but not because her nation's emissions have risen the last two years. Her difficulty arises from those ugly Americans' unwillingness to keep up appearances.

Later this week, we will be treated to the spectacle of "a statement backed by all 28 EU states, [in which] the European Union and China will commit to full implementation of the Paris Climate Agreement"—undoubtedly accompanied by lamentations that the United States has disrupted the charade by walking off stage. How the world misses President Obama's enthusiasm for a debating society that delivers no substantive action, or even a useful framework for assessing results, only a forum for bashing America. Such nerve, our nation has, to excuse itself from that pastime.

Oren Cass is a senior fellow at the Manhattan Institute.

Photo by Spencer Platt / Getty Images

52 Vanderbilt AvenueNew York, NY 10017 | (212) 599-7000

NATIONAL REVIEW

Don't Apologize for Being Honest about Climate Change

A response to Ross Douthat's lukewarm lukewarmism

By Oren Cass — June 5, 2017

Writing about climate change in the *New York Times*, Ross Douthat describes "lukewarmers" as those who:

> accept that the earth is warming and that our civilization's ample CO2 emissions are a major cause. They doubt, however, that climate change represents a crisis unique among the varied challenges we face, or that the global regulatory schemes advanced to deal with it will work as advertised. And they raise an eyebrow at the contrast between the apocalyptic, absolutist rhetoric with which these schemes are regularly defended and their actual details, which seem mostly designed to enable the globe's statesmen to greenwash the pursuit of economic and political self-interest.

Douthat placed himself among the lukewarmers and very graciously referred his readers to some of my recent work for a longer discussion of those themes. But his column was also quite gracious in conceding two problems with lukewarmism, which instead deserve rebuttal.

Douthat's Problem #1: "No less than alarmism, lukewarmism can be vulnerable to cherry-picking and selection bias, reaching for any piece of evidence — and when you're dealing with long-term trends, there's a lot of evidence to choose from — that supports its non-catastrophic assumptions, even if the bulk of the data starts to point the other way."

This is a generic critique that might apply to any position on any issue. School-choice advocacy is vulnerable to cherry-picking and selection bias, as is support for universal pre-K. So are the claims that Scandinavian-style welfare states are good or bad for innovation and economic growth. And the claims that an interventionist U.S. foreign policy promotes or harms our national interest. Highlighting such a complaint about lukewarmism would make sense only if the position were uniquely reliant on such bad behavior.

To the contrary, the key hypothesis (of my work, anyway) is that *even working from the mainstream scientific and economic studies advanced by alarmists*, the data do not support a conclusion of catastrophe. That is, the effects identified by the U.N.'s Intergovernmental Panel on Climate Change are serious but manageable. The economic costs identified by the Obama administration's Social Cost of Carbon analysis are no larger than those associated with a variety of other policy issues.

Of course, plenty of people cherry-pick this or that study in an effort to undermine the mainstream conclusions of climate science. But such analysis is unnecessary to a moderate view of climate change and, I would argue, often counterproductive. Lukewarmism is, or should be, about describing accurately the mainstream of climate research and then assessing how well human society's resilience and capacity for adaptation will allow it to cope with the challenges we might face.

Douthat's Problem #2: "While lukewarmers may fancy ourselves serious interlocutors for liberals, we're actually just running interference on behalf of know-nothing and do-nothingism, attacking flawed policies on behalf of a Republican Party that will never, ever advance any policies of its own."

This mistakes an argument about the nature of the climate problem for one about the ideal solution. Lukewarmism is an effort to provide much needed perspective and context on the climate debate. Importantly, it is a *corrective* to the outlandish claims of catastrophe, made by environmental activists, that bear no relationship to mainstream research — they can hardly complain that others are taking the time to point this out. If we want the public to interpret correctly the implications of climate change, the correct interpretation should be given a vigorous defense. Insisting that policy deliberations begin from an appropriate policy definition does not worsen the quality of those deliberations and is not "running interference."

Further, climate policies are typically flawed in ways that remain obvious regardless of how seriously one takes climate change. Obama's Clean Power Plan was costly, it was an illegitimate expansion of federal power, and it would not have materially affected global temperatures. The Paris Agreement was an absurd piece of political theater that disadvantaged the United States and endorsed the developing world's refusal to take serious climate action. These observations hold equally well if one is ice cold, lukewarm, or boiling mad.

But sometimes a firm grasp of the problem matters a lot, and then the lukewarmer's obligation is to apply his conclusions honestly. If someone proposes truly radical solutions that might avert climate change at unfathomable cost, lukewarmers should decry the overreaction. Likewise, if someone rejects sensible policies that have concrete benefits by rejecting any cause for concern,

lukewarmers should insist they be serious. As I wrote for Fox News when Trump signed his executive order on the topic, "Trump Is Wrong on Climate Change":

> We should want government planners at every level to take the best existing research into account as they make public investments and set policy that will influence others. If farmers and resort owners and mayors and naval planners all build with an eye toward how the future might change, then those changes as they arrive won't be so harmful or expensive.
>
> Yet, in addition to starting the repeal of costly mitigation efforts like Obama's Clean Power Plan, Trump's executive order entirely erases an Obama order aimed at "preparing the United States for the impacts of Climate Change." Many of the points in that program still make sense. Perhaps the greatest mistake made by those who overinflate the risk of climate change is to forget that our society has a tremendous capacity to adapt and innovate. But it would also be a major mistake to forget that public policy can either foster or hinder that process.

Certainly, that's no comprehensive agenda. But it is a message that the politicians and policymakers of both parties would benefit from hearing.

READ MORE:
The Fanatical Prophet of Climate-Change Doom
Bill Nye's Embarrassing Face-Off on Climate Change
A Top Climate Scientist Blows the Whistle on on Shoddy Climate Science

— *Oren Cass is a senior fellow at the Manhattan Institute.*