NEW AMERICA

November 2023

The Uncertainty of the Unthinkable

Imagining the Future of Nuclear Dangers to the United States

J. Peter Scoblic

Future Security
Last edited on November 07, 2023 at 12:05 p.m. EST

Acknowledgments

I would like to thank the Carnegie Corporation of New York for its generous support of this work. I would also like to thank the interviewees, survey respondents, and workshop participants whose expertise made this project possible. The team at N Square, including Pupul Bisht, Lisa DeYoung, Erika Gregory, Morgan Matthews, as well as John A. Sweeney from the School of International Futures, provided magnificent intellectual and logistical support, as did facilitators Josh Brockway, Eben Kowler, and Hauson Le. I appreciate the comments of Kara Cunzeman and Zachery Tyson Brown, as well as those of several anonymous reviewers who were kind enough to read earlier drafts. Finally, I owe special thanks to Laura Draper, Samanvya Hooda, Kara Joyce, Barron YoungSmith, and Sacha Zimmerman.

Editorial disclosure: The views expressed in this report are those of its author and do not necessarily represent the views of New America or the Carnegie Corporation, their officers, or their employees.

About the Author

J. Peter Scoblic is a Future Security program fellow with New America, where he researches U.S. nuclear policy, strategic foresight, and geopolitical forecasting.

About New America

We are dedicated to renewing the promise of America by continuing the quest to realize our nation's highest ideals, honestly confronting the challenges caused by rapid technological and social change, and seizing the opportunities those changes create.

About Future Security

Future Security is a partnership between New America and Arizona State University. It reconceptualizes U.S. security policy towards a holistic engagement with current and future challenges including domestic terrorism, armed drones, climate change, pandemics, rising authoritarianism, and new and emerging technologies.

Contents

Introduction

> *"In developing this strategy, the Department considered the risks stemming from inaccurate predictions, including unforeseen shocks in the security environment."—U.S. Department of Defense,* 2022 National Defense Strategy[1]

> *"I am now going to ask the reader for an unpleasant feat of imagination."*
> *—Herman Kahn,* On Thermonuclear War[2]

Nuclear weapons are back. Not that they ever went anywhere. But while most people, including policymakers, were attending to other matters, the atomic landscape morphed. With Russia's 2022 invasion of Ukraine, it shifted tectonically, focusing American officials and their constituents on nuclear threats in a way not seen since the collapse of the Soviet Union.

Polls last year showed that roughly three-quarters of Americans feared the conflict would prompt a Russian nuclear strike on the United States. In October 2022, President Biden, one of the few remaining U.S. elected officials with deep nuclear experience, said, "We have not faced the prospect of Armageddon since Kennedy and the Cuban missile crisis."[3] This spring, nuclear experts moved the Doomsday Clock, that iconic symbol of existential danger, to a mere 90 seconds from midnight—the closest it has ever been.[4]

These fears may be overstated—Metaculus, a forecasting platform, has consistently put the probability of Russian nuclear use in Ukraine in 2023 at less than 0.5 percent[5]—but Putin's provocations are not the only nuclear danger the United States confronts. The erosion of the U.S.-Russian arms control regime, the growth of China's nuclear forces, and the persistence of geopolitical flashpoints—to say nothing of North Korea's solid-fuel intercontinental ballistic missiles (ICBMs), Iran's growing stocks of enriched uranium, and the seeming proliferation of personality-driven regimes—all herald a "new nuclear age" whose dynamics are more complex than the bipolarity of the Cold War.

A new nuclear age would seem to demand new ideas about how best to deter America's adversaries and what to do if deterrence fails. Yet for all the recent talk of "integrated deterrence"—the holistic approach to discouraging enemy aggression articulated in the *2022 National Defense Strategy*—when it comes to nuclear weapons specifically, the novelty of the current moment seems mostly to have revived old arguments about old ideas.[6] Once again, we are debating the utility of lower-yield devices, the wisdom of a no-first-use posture, and the proper role of nuclear weapons in national security generally.

Admittedly, "new" is poor proxy for "better." The quality of an idea relies on how well it reflects the way the world works, just as the quality of a map depends on its geographical accuracy. Many old ideas remain estimable to the extent that the assumptions underlying them still accord with reality. The central challenge of nuclear policy is that the nature of reality is elusive. The relationships between cause and effect are obscure. This makes it difficult to be certain that we are pursuing our goals most effectively.

We can ascribe some of our ignorance to the limits of causal inference, but we also lack data. The Cold War left many questions unanswered because it remained cold, affording few opportunities to test hypotheses. So, although the superpowers may have avoided direct conflict because they feared the high costs of nuclear war, in accordance with deterrence theory, it is also possible that we just got lucky. The ratio of good strategy to good fortune remains unknown. Seventy-eight years after the United States dropped atomic bombs on Hiroshima and Nagasaki, we cannot say whether nuclear deterrence is delicate or robust. We cannot say if "tactical" weapons strengthen deterrence by increasing the credibility of nuclear threats, or whether they weaken it by making nuclear weapons more "usable." We cannot say, if such weapons were used, whether conflict could remain controlled or whether battlefield use would inevitably escalate to a strategic exchange.

Yet we do say these things. Often with great conviction. The problem is not that we have failed to surmount the limits of causal inference. We have not because we cannot. The problem is that we often act as if we have. The changing nature of the nuclear threat has prompted less theoretical introspection than warranted. In many cases, we are simply reprising Cold War arguments about the military utility of nuclear weapons and the value of diplomatic constraints on them. Confronted with the challenge of traversing new territory, we have simply dusted off outdated maps, increasing the risk that we will head in the wrong direction and wind up somewhere we don't want to be.

The goal of this project was not to map the new nuclear age—the landscape is changing too rapidly for a static picture—but to renew interest in cartography. With apologies to Eisenhower, maps are useless, but mapping is essential, particularly in a time of dynamic change. Every policy is a prediction, and many nuclear policies rest on implicit long-term predictions. For example, per its nuclear modernization plans, the United States is building the arsenal policymakers think the country will need decades from now based on existing beliefs and expectations. Yet the far future is likely to surprise us, so we must learn to keep up.

Many defense thinkers nod to the difficulties posed by the uncertainty of the future—the *2022 Nuclear Posture Review* notes the need for resilience and adaptability in the face of "significant uncertainties and unanticipated challenges"[7]—but how can we prepare for the unanticipated? As the economist

Thomas Schelling once wrote, "One thing a person cannot do, no matter how rigorous his analysis or heroic his imagination, is to draw up a list of the things that would never occur to him."[8] As a solution, Herman Kahn, the infamous defense strategist, suggested several "strange aids to thought," including scenarios—narratives of plausible alternative futures that he used to imagine various paths to and outcomes of nuclear conflict.

In that tradition, this project surveyed and convened subject-matter experts to generate plausible visions of nuclear dangers in the year 2043. This exercise in scenario-generation was not an effort to predict the future, but an attempt to highlight how little we know about it—a thought experiment to help the nuclear-security community consider the uncertainty of the unthinkable.

Hedgehogs on a Treadmill

International relations is what decision-making scholars call a "low-validity domain."[9] Politics among nations is marked by murky causal relationships and frequently vague, often delayed feedback, all of which inhibit learning. Despite the popularity of the metaphor, geopolitics is not chess. There are few rules, meaning that experience does not necessarily lead to expertise and that mastery is illusory. Policymakers may benefit from their years of service and from the knowledge generated by political scientists and their academic kin, but high-stakes national security decisions often come down to judgment, a faculty that can fail the best of us at the worst of times.

Good judgment is particularly hard to come by when the future is murkier than usual, and as publications from *Financial Times* and *Foreign Affairs* to *Harvard Business Review* have all declared, we are living in an "age of uncertainty."[10] Last year, a United Nations report noted that political polarization, broad societal transformation, and climate change have combined to generate a "new uncertainty complex."[11] And a recent analysis found that global uncertainty has increased dramatically over the past decade and that the outbreak of the COVID-19 pandemic produced more uncertainty in the United States than any other event since 1952—a remarkable finding considering the many wars, crises, and disruptions of the past 70 years.[12]

This high degree of uncertainty suggests that we should embrace epistemic humility—the recognition that we often know far less than we think we do.[13] Yet instead of analytical restraint among political experts, scholars find opinionated overconfidence. Psychologist Philip Tetlock's early research on expert political judgment found that events which experts deemed 100 percent certainties occurred only 80 percent of the time. More generally, their expectations of the future tended to be no more accurate than those of well-informed amateurs or simple extrapolation algorithms. Their judgment was hit-or-miss, to put it kindly.[14]

Although many took these findings as an indictment of the very notion of expertise, Tetlock found significant variance among specialists with different cognitive styles—specifically between "hedgehogs" and "foxes." In Tetlock's formulation, hedgehogs cling tightly to parsimonious worldviews, while foxes nimbly switch among many, recognizing that all models are wrong but that some are useful—sometimes. Forecasters benefit from acknowledging what they don't know and continually asking, "How might I be wrong?" Epistemic humility is a potent judgmental tonic.

Such humility would seem particularly beneficial for nuclear experts, if for no other reason than the stakes of being wrong could well be civilizational. But the greatest barrier to demonstrably effective nuclear policy is a lack of experience.

As scholar Francis Gavin has noted, we have only three fundamental data points: two, nine, and zero.[15] Two atomic bombs have been used, nine states possess nuclear weapons, and there have been zero nuclear wars. That zero is both welcome and problematic: We can take comfort from the fact that no one has employed a nuclear weapon in war since 1945, and we can infer that they have not done so because the costs of nuclear war would be unacceptably high, as deterrence theory suggests. But we cannot prove it, and there are plausible competing or complementary explanations, leaving a substantial analytical challenge. Determining why something happened is difficult. Determining why *nothing* happened is far more so.

Nevertheless, arguments about nuclear deterrence have often employed a deductive logic based on rationalist assumptions that have little basis in evidence because no one has ever fought a nuclear war. Which makes many of the beliefs about nuclear deterrence just that: beliefs. And, absent the ability to test hypotheses, it is difficult to say that one belief is more accurate than another. We cannot, a priori, distinguish good strategy from bad strategy. We do not know what would cause deterrence to fail, and if it failed, we do not know how a nuclear war would unfold. Despite decades of scholarship by some of the nation's top thinkers, there is not a science of deterrence, and theories of nuclear conflict remain contested.[16]

"Determining why something happened is difficult. Determining why *nothing* happened is far more so."

The nuclear age does hold lessons, notably in the terrifying (but empirically useful) history of crises and near misses—times when that zero threatened to become nonzero.[17] Unfortunately, the usual challenges of learning from history—wherein we must confront the mixed lessons of experience, assess the value of competing narratives, and continuously update beliefs in the face of new evidence—are compounded by the closeness with which the U.S. government guards its nuclear secrets and the difficulty of accessing Soviet archives. This is why, 60 years later, our understanding of the Cuban Missile Crisis continues to evolve.[18] Even if we understood perfectly what happened during those 13 days in October 1962, we could only apply those lessons cautiously because a future crisis will differ in fundamental ways. We must always handle historical analogies with care.[19]

Given the dearth of experience and given the challenges of extracting knowledge from the experience we do have, one might expect nuclear experts to be like Tetlock's foxes, displaying modesty in the face of existential threats. Instead, the field is rife with hedgehogs—and it has been for a long time. In the late 1980s, one RAND Corporation report complained: "The American debate over the use and control of nuclear weapons tends toward the theological. … [S]ince little evidence is available, the debaters' assertions are untested and untestable. The dearth of test data has prevented the strategic debate from changing very much."[20]

It was that very debate in the 1980s that prompted Tetlock's original research on expert political judgment. To oversimplify the dispute: Doves were convinced that Ronald Reagan's arms buildup would prompt nuclear apocalypse, while hawks were certain that only Reagan's arms buildup would prevent it. How to determine who was right? As Tetlock wrote: "It was not clear how the classic methods of clarifying causality, experimental and statistical control, could even be applied to explain the nonoccurrence of an event (nuclear war) that qualified as sui generis if one ever did."[21] This epistemological challenge did little to temper the confidence of either hawks or doves, but it did preclude convergence. Instead of synthesis, we got silos.

More than three decades later, the arguments persist. As archives have opened and scholars have applied new research methods to larger data sets, we know more than ever, but wisdom remains elusive. The barriers that obscure the truth are still in place, yet many nuclear experts are convinced that they know how nuclear dynamics work and therefore that they can identify the optimal course of action. As Gavin has written: "I have had more than one important scholar in this field tell me we know all [we] need to know about how nuclear deterrence works and, by extension, why we have never had a thermonuclear war."[22] Political scientist Paul Avey reports similar experiences, writing that, by the end of the Cold War, "there was a sense that we understood the major contours of the nuclear world."[23]

"As archives have opened and scholars have applied new research methods to larger data sets, we know more than ever, but wisdom remains elusive."

That was not true then, and it is not true now if for no other reason than the topography of the nuclear landscape has shifted radically in the last 30 years. Just the past few years have seen dramatic change. North Korea, which has enough

fissile material for several dozen nuclear weapons, has flight-tested a solid-fuel ICBM capable of reaching the United States.[24] Iran has enriched uranium to the point where it could have enough for a weapon within a couple of weeks and produce an actual weapon within a year.[25] China is expanding and modernizing its strategic nuclear forces, and a recent Pentagon report estimates it could achieve rough parity with the United States by 2035, suggesting that it might be abandoning its minimum deterrent posture.[26] And of course Russia has reemerged as an adversary. Vladimir Putin and other top Russian officials have repeatedly threated to use nuclear weapons in Ukraine, and Russia has deployed nuclear weapons in Belarus. Meanwhile, Moscow has suspended participation in the New Strategic Arms Reduction Treaty (New START) after undermining the Intermediate-Range Nuclear Forces Treaty to the point of unsustainability, bringing the U.S.-Russian arms control regime to the brink of collapse.

We have entered what a number of analysts have termed a "new nuclear age," and unfortunately we are cognitively ill-equipped to navigate it.[27] As Vipin Narang and Scott Sagan have written, "This new nuclear age demands new thinking and analysis about the challenges generated by the continued existence and spread of nuclear weapons."[28] The growth of China's arsenal alone has replaced the relative (if often overstated) stability of Cold War bipolarity, replacing it with a dynamic that scholars and practitioners have compared to the three-body problem in celestial mechanics.[29] Whereas Newtonian physics allows scientists to model the gravitational interplay of two objects, the behavior of three is unpredictable. One nuclear analyst drew a more colorful analogy: "I think of giant Calder mobiles. You push on a thing in one place and the whole thing starts swinging in a really unpredictable, wacky way."[30] Nevertheless, the schools of thought to which most American experts belong today are familiar:

- **Dominance**: Nuclear weapons did not change the nature of war, which remains an extension of politics, and deterrence requires robust offenses and defenses because they enhance credibility and will limit damage if deterrence fails. In that case, the United States must be prepared to meet and defeat the enemy at every rung of the escalatory ladder, thereby ending the conflict on favorable terms. More extreme adherents believe that arms control advocates are merely useful idiots who legitimize America's adversaries, constrain its freedom of action, and codify the perversity of "mutual assured destruction."

- **Flexible Response**: The primary goal of nuclear weapons is to deter an attack on the United States and its allies by maintaining a secure second-strike force. Arms control can provide transparency and predictability among adversaries, enhancing strategic stability. Some adherents advocate a no-first-use pledge, but others argue that the United States might face a conventionally superior foe who could only be stopped with nuclear weapons. In a crisis, the president needs options, and adversaries

with secure retaliatory forces may dismiss U.S. threats of a strategic nuclear strike. Lower-yield weapons preserve a credible response, convincing the adversary that victory is impossible.

- **Minimum Deterrence**: The only credible role for nuclear weapons is to deter a strategic attack on the homeland. Deterrence is robust because even a handful of survivable weapons ensure a retaliatory capability that could inflict unacceptable damage on an adversary. A large arsenal that includes "more usable" weapons only increases the risk of accident, miscalculation, and inadvertent escalation. Some advocates argue that the weapons themselves are not the problem, meaning that, although potentially useful, arms control is no panacea. Peace requires reconciling the competing interests that lead to conflict.

- **Abolition**: Deterrence provides a precarious peace at best, and a nuclear war would be apocalyptic because escalation is not controllable. What's more, nuclear weapons are morally abhorrent, and the fact that the president has sole launch authority is reckless. Nuclear disarmament—a commitment already enshrined in the Treaty on the Non-Proliferation of Nuclear Weapons—is the only sensible goal. In the interim, the United States must take all diplomatic steps possible to reduce the risk of nuclear war, and it should eschew both "tactical" nuclear weapons and strategic missile defenses because they threaten stability.

Nuclear experts I interviewed were blunt in appraising the similarities between Cold War and post-Cold War thinking. One said, "I think deterrence theory hasn't changed in 70 years." Another agreed: "Nuclear thinking is largely stuck." A third just said: "It's fucking *Groundhog Day*."

To some, the situation teeters between the satirical and the soporific. In an interview last year, Middlebury's Jeffrey Lewis lamented the predictability of discussions among nuclear experts: "I almost never go to talks in my own field anymore, because I know what people are going to say. It's like the old joke about the comedians' convention where somebody says, 'Number 47!' and everyone laughs—that's what it's like."[31] Remarkably, this quip parallels a comment that nuclear scholar Janne Nolan made to me some 20 years ago during a particularly tedious panel discussion we attended: "They should just hand us all auction paddles with numbers representing different arguments. It'd go a lot faster."[32]

Perhaps the greatest change has been the revival of the abolition movement,[33] whose profile surged in 2007 when former statesmen George Shultz, Sam Nunn, Henry Kissinger, and Bill Perry published an op-ed calling on the United States to reassert the "vision of a world free of nuclear weapons."[34] Two years later, President Barack Obama, who had thought about the perils of Cold War deterrence since his undergraduate days,[35] said, "I state clearly and with

conviction America's commitment to seek the peace and security of a world without nuclear weapons."[36] A few months later, the Nobel Committee awarded him its Peace Prize, emphasizing his "vision of and work for a world without nuclear weapons."[37] But the following year Obama signed off on a nuclear posture that fit within the flexible-response camp, demonstrating the stubbornness of the status quo.

One way to understand this stubbornness is as an example of a calcified mental model. Mental models consist of beliefs about cause and effect that allow us to test courses of action before actually committing to one.[38] They help us make sense of a world that overwhelms with information. Unfortunately, we tend to filter information in a way that supports rather than updates our beliefs. As a result, our mental models remain sticky even in the face of disconfirming evidence. They turn stale when exposed to change, yet we remain confident in their reliability. The problem is not only that static models produce delusions—beliefs about reality that do not accurately reflect reality—but also that those delusions feed decisions that can have unintended consequences. In a rapidly changing world, cognitive stasis is deadly. Our beliefs must shift as the operating environment shifts.

If the problem is that our mental models are stuck, then the obvious course of action is to unstick them. We don't need a new idea. We need the ability to generate new ideas as appropriate. We don't need a new map. We need the ability to map. We need the fox's epistemic humility and the intellectual flexibility that it promotes. Unfortunately, the national security community does not reward such things. Instead, we mistake confidence for competence, we disdain "wishy-washiness," and we embrace simplistic analyses that make for punchier headlines, pithier bottom lines, and snappier soundbites. As MIT's Heather Williams put it, "Moderation isn't sexy, particularly when it comes to nuclear weapons."[39] In the wild, foxes hunt hedgehogs. In Washington, the opposite is true.

"In a rapidly changing world, cognitive stasis is deadly. Our beliefs must shift as the operating environment shifts."

This project was an attempt to challenge the hegemony of the hedgehog by allowing nuclear experts the opportunity to play with ideas and causal relationships in a consequence-free environment, generating a set of alternative

futures, or scenarios. Scenarios were first used by Herman Kahn to explore the uncertainty of the nuclear revolution—to deal with the lack of experience. As he wrote, "Nuclear war is still (and hopefully will remain) so far from our experience, that it is difficult to reason from, or illustrate arguments by, analogies from history."[40] While his erstwhile colleagues at the RAND Corporation turned to systems analysis, game theory, and other quantitative methods, Kahn turned to imagination and narrative. His cure for the dearth of experience was "ersatz experience." If we didn't have analogies, we would simply make them up.

Via Kahn, scenarios became a popular tool for breaking up staid ways of thinking. Pierre Wack, a Royal Dutch Shell executive, first encountered scenarios in the 1970s at the Hudson Institute, which Kahn had co-founded.[41] He subsequently used the method to challenge his colleagues' persistent assumption that the company's access to Middle East oil would remain open, despite signs of incipient disruption. Static mental models might work fine in stable times, he later wrote. "In times of rapid change and increased complexity, however, the manager's mental model becomes a dangerously mixed bag: Rich detail and understanding can coexist with dubious assumptions, selective inattention to alternative ways of interpreting evidence, and illusory projections." Engaging with alternative plausible futures shone a light on these cognitive failings. "Scenarios give managers something very precious: the ability to reperceive reality."[42] That re-perception, in turn, facilitates new thinking, or what Kees van der Heijden, another Shell scenario practitioner, called "the art of strategic conversation."[43]

This exercise was an effort to encourage that art.

Survey Findings

To identify which nuclear dangers to the United States experts are most concerned about today, the forces they think will have the greatest influence on the future, and their expectations of what the top nuclear dangers will be in 20 years, I sent surveys to 100 professionals with experience in nuclear security, yielding 50 responses. I then coded these responses and compared concerns about current nuclear dangers with expectations of nuclear dangers in 2043. Top takeaways from the survey include:

- Russia is seen as the leading threat to the United States today, with 78 percent of respondents listing it among their top three concerns—far more than any other danger. Given its 2022 invasion of Ukraine and repeated threats to use nuclear weapons, this is unsurprising. More surprising is the expectation that Russia's nuclear salience will decline: Only 24 percent of respondents identified Russia as a top potential danger in 2043.

- By contrast, only 50 percent of respondents mentioned China as a top concern today, and only 36 percent thought it would present a principal danger two decades from now, despite the Biden administration's view that China presents the "pacing challenge" to the United States[44] and the Pentagon's analysis that the People's Liberation Army "is advancing its long-term modernization plans to enhance its strategic deterrence capabilities."[45]

- Many respondents (40 percent) expressed concern about growing strategic instability—that is, they are worried not only about specific states but about unsteady dynamics among them, now and in the future. Respondents were more concerned about the possible failure of deterrence, the potential for escalation, and the emergence of greater complexity as more nuclear states field more nuclear weapons. Although 32 percent of respondents cited arms races with Russia and China as a top concern today, fewer (14 percent) expressed concern about proliferation to new states in the short term. However, those numbers flipped when envisioning nuclear dangers in 2043, with nearly twice as many respondents citing horizontal proliferation over vertical proliferation.

- Nuclear terrorism barely registered as a present or future worry among respondents. This is surprising given the anxiety that policymakers, nuclear experts, and the public expressed 20 years ago. In 2004, during their first presidential debate, both George W. Bush and John Kerry cited nuclear terrorism as their top fear. A poll of international security experts commissioned by Senator Richard Lugar the following year found a 29

percent probability of a nuclear attack by 2015, odds that were echoed in a mathematical model developed by Harvard's Matthew Bunn.[46] Others, like Harvard's Graham Allison, expressed even greater concern.[47] That concern appears to have abated, suggesting the sharp change that can take place in two decades.

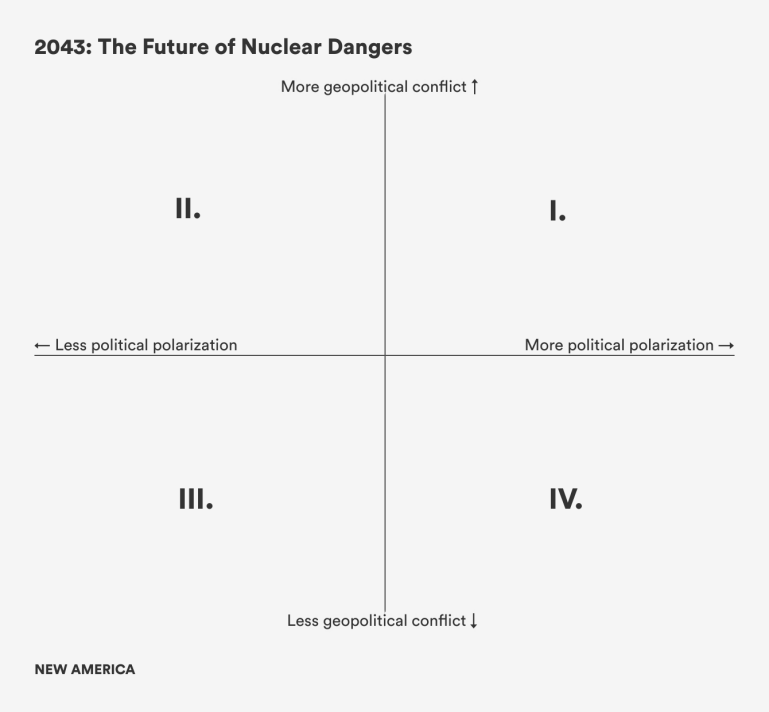
- American political dysfunction and its detrimental effect on policy will significantly influence the future of nuclear dangers to the United States, according to 50 percent of respondents—more than any other factor cited. Respondents expressed particular concern about domestic political polarization, noting that these divisions could weaken U.S. leadership abroad or result in a neo-isolationist foreign policy that weakens the power of democracies generally at a time of rising authoritarianism.

Generating Scenarios

The survey data fed a one-day, online workshop, which convened 20 respondents (who had indicated interest and availability) to sketch plausible scenarios of the nuclear dangers the United States could face in 2043. To structure this exercise in imagination, I used the so-called "deductive method" of scenario planning, in which opposing values of two driving forces are combined to generate four possible futures, which can be represented in a two-by-two matrix.

Focusing on only two driving forces of change can seem reductive given the wealth of factors that will influence the future operating environment, and focusing on four particular scenarios can seem limited given that events could transpire in many other ways. However, scenarios are not meant to be exhaustive or mutually exclusive, nor are they meant to be predictive. The goal was to produce narratives of 2043 that stretch the nuclear community's conception of what is possible—to shrink the list of things we have not thought of, challenge our expectations of the future, and jostle our mental models.

The first task was therefore to identify which driving forces of change would generate scenarios that best served these goals. Workshop participants did this first through individual brainstorming and then in team discussions. Combining suggestions from these discussions with data from the survey, I chose to explore scenarios whose contours were defined by the degree of U.S. domestic political polarization and the degree of international cooperation to combat climate change, yielding the following matrix:



The 20 participants were divided into four teams of five people. Each team was assigned a quadrant and instructed to describe a future world that operated according to a consistent logic and to craft a narrative of how we got from now to then. An external facilitator coordinated each team's discussion, prompting members to consider the nuclear ramifications of the world they envisioned, and the day concluded with each team outlining its scenario for the full group. Time constraints limited the detail each team was able to provide. So, drawing on the workshop's final discussion, as well as notes taken by both participants and facilitators, I extrapolated from and elaborated on each summary to create more detailed narratives, which participants then had the chance to review, correct, and comment on. (For detailed scenarios, see **Appendix**.)

Five key themes emerged from the scenarios:

1. The United States is struggling to address the tri-polarity presented by China's nuclear expansion and the possible emergence of another nuclear-peer competitor. According to Admiral Charles Richard, U.S. Strategic Command is "furiously" rewriting deterrence theory to account for the "active stabilization" that the "three-body problem" represents.[48] Putting aside the debatable suggestion that bipolarity was intrinsically stable, this struggle raises the question of how the United States would manage additional nuclear antagonists capable of striking the United States, or a world in which additional nuclear dyads generate more paths to nuclear employment, or a world in which new nuclear states place U.S. friends and allies at greater risk.

2. For all its novelty, the "new nuclear age" will remain rife with old dangers. Conflict could erupt in a "predictable" way—it's hardly novel to point out that the tensions between India and Pakistan constitute a dangerous flashpoint, as one scenario did—so American policymakers must continue to attend to traditional concerns even as they push themselves to imagine problems that they may not have considered. The future will surprise, but the most dangerous developments may be those already on our radar.

3. Nuclear experts must pay attention to developments outside their field, including other existential risks, such as climate change and its impact on a range of nontraditional security issues like resource scarcity and migration. The things that could most impact nuclear security may, on their face, have little to do with nuclear security. The operating environment is a complex system, and a more holistic view could provide a more accurate understanding of dangers and opportunities.

4. The Biden administration is supporting nuclear energy to reduce carbon emissions and achieve a net-zero emissions economy by 2050. However, the U.S. ability to take advantage of the global nuclear energy market significantly lags that of Russia and China. As other nations turn to nuclear energy to slow or offset the effects of climate change, the United States risks losing not only geopolitical influence, but also the ability to set or influence proliferation safeguards.

5. Domestic political dysfunction could severely limit Washington's ability to adapt to the new nuclear age. Worse, it is extremely difficult to imagine how we might reverse or even work within the current level of rancor. Not only did survey respondents list polarization as a top factor influencing future nuclear dangers, but workshop participants struggled to envision plausible paths to a future of greater political comity.

Conclusion

The goal of this project was to explore and challenge expectations of future nuclear dangers and the factors that might shape them. The scenario-generation exercise was designed to encourage participants and the broader security community to think beyond the crises of today, to consider the implications of key uncertainties, and to reflect on the range of futures for which American policymakers should prepare.

A post-workshop survey found that most participants considered the exercise useful (median response of "4" on a 5-point scale), but determining what elements or outcomes were most useful was difficult. When asked directly, few participants reported changing their opinions on the future of nuclear dangers. However, the answers to more obliquely phrased questions—e.g., "What did you find most surprising?"—indicated that many had a more nuanced experience. One participant who reported little change also noted, "We considered ideas I had never brought to mind," suggesting the exercise did address, to some extent, the cognitive limits that Schelling identified decades earlier, when he wrote that no one can make a list of things they haven't thought of.[49]

Schelling made this point to highlight the usefulness of wargames, which were another of Kahn's "strange aids to thought." To Kahn, the dynamic interaction of games could counteract the limits of analysis and imagination if, as he wrote, a player emerged from a game saying, "It never occurred to me that the response to X could or would be Y."[50] Like scenarios, games are not predictive, and they are not usually intended as replicable scientific exercises. Their value often comes from the very fact that they are not replicable because the diversity of game outcomes demonstrates variance in potential real-world outcomes. Just as scenarios demonstrate that there is no single plausible future, games demonstrate that there is no single plausible outcome of a conflict.[51] Contra the rationalist model of deterrence that has often dominated, the character of the players matters, as do the particular dynamics between them.

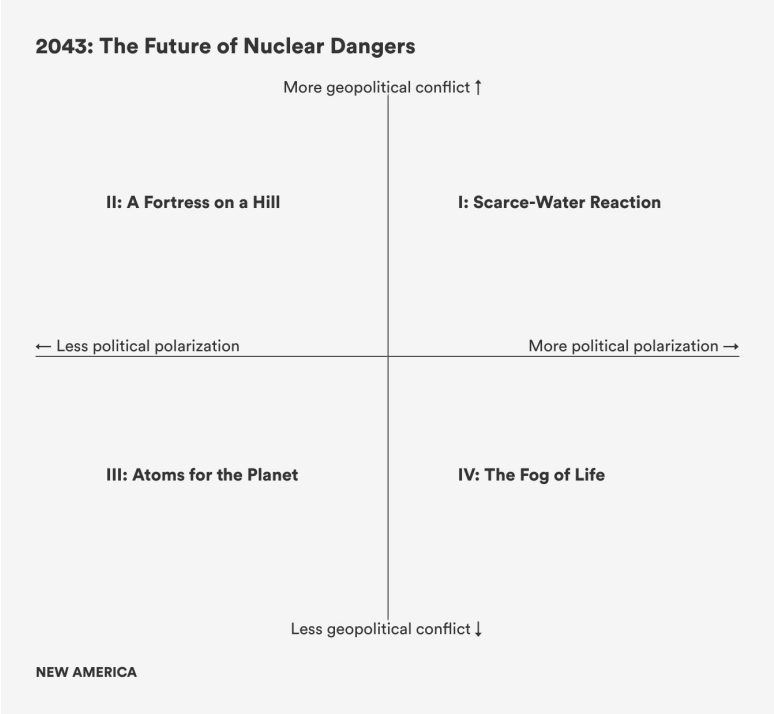
This is one reason an increasing number of scholars have turned to games and scenarios to study nuclear conflict. Recent scenario exercises have addressed challenges to extended deterrence (Center for Strategic and International Studies), the future of Iran's nuclear program (Center for a New American Security), the contours of the new nuclear age (Center for Strategic and Budgetary Assessments), and the prospects for nuclear abolition (N Square).[52] Recent studies of nuclear wargames include efforts by Brown University's Reid Pauly, who demonstrated that deterrence is hardly the only dynamic that explains nearly 80 years of nuclear restraint. Stacie Pettyjohn and Hannah Dennis of the Center for a New American Security ran a game exploring Chinese nuclear use in a potential conflict over Taiwan.[53] And Pauly, along with scholars

Erik Lin-Greenberg and Jacquelyn Schneider, have called for greater use of wargaming in international relations research generally.[54]

This exercise provides a data point in this growing constellation of efforts to think differently about nuclear weapons. Whereas most recent scholarly work draws on archival research or qualitative and quantitative social-scientific tools to generate knowledge, these efforts draw on the ersatz experience of imagined futures. Given the lack of actual experience in nuclear matters—one that we must hope will continue—we should make greater use of strange aids to explore the future of nuclear dangers. Our policies are only good to the extent that they reflect reality, and our understanding of reality must continually evolve as the operating environment changes. Scenarios (and games) provide a way to routinely challenge our assumptions—if we institutionalize the use of imagination in national security. That is the way to undermine the hegemony of the hedgehog and address the uncertainty of the unthinkable.

Appendix: Scenarios of Nuclear Dangers in 2043

The following scenarios were generated by exploring different ways in which the geopolitical effects of climate change might interact with U.S. political polarization to affect nuclear dangers in 2043. These alternative imaginings of the future are not intended to be predictive but rather to reflect and stretch the limits of plausibility. Endnotes ground some of the scenarios' starting conditions and future developments in fact, but these narratives, including the notional actions of real public figures, are fictional.



Scenario I: Scarce-Water Reaction

Political Polarization (More)

Geopolitical Effect of Climate Change (More Conflict)

Editorial note: This report was written prior to the Israel-Gaza crisis of October 2023. The scenario that follows imagines a different conflict and has not been updated to include or reflect ongoing events.

By 2024, temperatures in the Middle East were increasing at twice the global average, approaching levels incompatible with human habitation.[55] Population growth strained infrastructure and resources, and increasingly intense sandstorms and floods added unpredictability to an already tenuous situation.

But it was water scarcity—a dozen Middle Eastern countries had been suffering extreme distress[56]—that ultimately pushed the region toward nuclear war. Desalination plants eased the problem somewhat, but they required vast amounts of energy supplied by oil, and a spill could threaten the seawater the plants processed. Certain Gulf states were one accident away from existential thirst.[57]

In 2025, the Gulf Cooperation Council (GCC)—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE)—decided to speed the transition from oil to nuclear power. Frustrated by years of nuclear negotiations with the United States and wary of Russia's reliability as a long-term partner, Crown Prince Mohammed bin Salman brokered a deal with President Xi Jinping.[58] China, which had a well-established energy and economic relationship with the GCC, offered more advanced technology at lower prices without the onerous provisions commonly found in the "123 agreements" required by the United States.[59] By 2030, the number of China-built nuclear power plants had increased from one (in Saudi Arabia) to 10 (throughout the region, including in Kuwait, Oman, and the UAE), diversifying the Middle East energy portfolio faster than previously thought possible.

Meanwhile, buoyed by a surge of neo-isolationist sentiment as Americans increasingly saw competition for global resources as a zero-sum game, Donald Trump had been reelected in 2024. The election killed any chance of reviving the Joint Comprehensive Plan of Action, which had limited Iran's nuclear program, and it dashed allied hopes that the United States might resume its role as a responsible global partner. On taking office, Trump began systematically dismantling his predecessor's internationalist accomplishments, beginning by withdrawing (once again) from the Paris Agreement. Xi used the occasion to bemoan the fickleness of democracy, and after Trump withdrew U.S. support to Ukrainian forces, Russia captured Kyiv in mid-2025, boosting fears of authoritarian rise and democratic decline. As European nations discussed further NATO expansion, Trump berated them as "delinquents who could pay their own way" and announced the withdrawal of 24,000 U.S. troops from Germany, reversing decades of American commitment to European security.[60]

In 2026, Iran started to produce new IR-1 centrifuges and to covertly enrich a portion of existing low enriched uranium (LEU) stocks to 90 percent, giving it enough highly enriched uranium (HEU) for five nuclear weapons within three months.[61] As International Atomic Energy Agency (IAEA) suspicions grew—and as its requests to tour Iranian facilities were denied—the United States, the United Kingdom, and France took their concerns to the UN Security Council,

only to have China block any action, claiming that new punitive measures would be inhumane in light of the country's extreme water shortages.[62] American officials tried to sustain attention on the potential threat, but with each presidential administration simply undoing the work of the last, the United States was seen as too inconsistent to engage.

In 2036, U.S. intelligence agencies warned that Iran had built a nuclear weapon. Iran denied the charge and accused the United States of pursuing regime change. At the same time, Iran's supreme leader argued that it would not be unreasonable for Tehran to pursue nuclear weapons, citing the U.S.-supported overthrow of Muammar Gaddafi in 2011, just eight years after the Libyan dictator had dismantled his nuclear program in a deal with the prior American administration. This qualified denial threw the region into disarray, prompting the Saudis to note their own nuclear-weapons potential.[63]

In 2038, a humanitarian crisis erupted in Israel, when a drought amplified by rising temperatures and desertification led Israel to tighten water access to the Gaza Strip, whose primary freshwater resource, the Coastal Aquifer, had long been over-extracted and contaminated by sewage and seawater.[64] Over the next five years, these restrictions resulted in the deaths of nearly 100,000 people through either dehydration or water-borne diseases, such as acute diarrhea and viral hepatitis. This crisis revived the largely dormant Arab-Israeli conflict, which had quieted since the negotiation of follow-on agreements to the Abraham Accords.

As the United States struggled to respond, the humanitarian crisis brought Iranian-Israeli enmity to a tipping point. In December 2042, the Israeli navy intercepted an Iranian ship, which Tehran claimed was carrying humanitarian aid but which was, in fact, carrying rockets and other weapons to militants in Gaza. As violence in the Strip escalated amid an increasingly desperate population, European nations secured Israeli approval to begin shipping bottled water. But when it discovered that a British-flagged ship was actually an Iranian vessel carrying more arms, Israel used the provocation to justify military strikes on Iran's known nuclear and missile facilities.

The attacks were too little too late. A week after the strike, Iran revealed its military capabilities—and escalated the conflict—by testing a nuclear device underground, becoming the world's 10th nuclear-weapon state. As soon as the Comprehensive Nuclear-Test-Ban Treaty Organization's sensors registered the explosion, Israel's government acknowledged the existence of its own nuclear arsenal, arguing that, as it had long promised, it had not been the first country to "introduce" nuclear weapons into the region. Concerned that Israel was the turn of an Iranian key away from destruction, the Israeli prime minister declared that Israel would meet any threat to its existence with "all means at its disposal," and to clarify that it had a secure second-strike capability, she announced a demonstration. On New Year's Day 2043, a Dolphin-class Israeli submarine fired

a cruise missile at an abandoned container ship in a remote patch of the Mediterranean Sea.[65] As circling drones beamed live footage, a streak of light shot toward the vessel, which disappeared in a blinding flash.

As a global spectacle, the demonstration rivaled the Moon landing, amplified by twenty-first century social media. Within 24 hours, video of the explosion—the first above-ground detonation of a nuclear weapon since 1980—was viewed billions of times worldwide. But fascination quickly turned to panic. Afraid that Iran would somehow target the United States after Israel—and wary of China's support for Tehran—Americans flooded stores and fled cites.[66] As the U.S. president struggled to get her Israeli counterpart on the phone, the governors of 18 states were forced to declare martial law to contain rioting, looting, and general chaos. The situation was made uglier by a rash of anti-Semitic attacks by Americans blaming Jews for embroiling the United States in potential nuclear war.[67] Israel's domestic allies on the left were flummoxed by the nation's violation of the nuclear taboo, while its allies on the right struggled to explain to their isolationist constituents why the United States should become involved.

The U.S. president vowed "catastrophic consequences" if Iran were to employ a nuclear weapon against any target. But as Israeli and Iranian ships warily circled and the region seemed one naval clash from nuclear war, the administration struggled to articulate a coherent strategy and calm a situation over which it had little control, leading one nostalgic commentator to quip, "America has gone from indivisible to invisible."

Scenario II: A Fortress on a Hill

Political Polarization (Less)

Geopolitical Effect of Climate Change (More Conflict)

The new American emphasis on domestic resilience began in 2023, when a series of Canadian wildfires blanketed nearly three-quarters of the United States in smoke that turned the skies an alien orange. The decreased air quality aggravated lung disease, triggered asthma attacks and acute bronchitis, and increased rates of heart attacks. The following year, fires produced a spike in pediatric lung disease, and the public health system, still reeling from COVID-19, was soon overwhelmed once again.

As the country burned and its citizens hunkered indoors, a bloc of liberals and conservatives converged on environmental nationalism. Republicans, already frustrated by U.S. commitments to Europe, began arguing that "American resources are for the American people." Democrats made a similar argument, albeit one that implied a more cooperative approach: "Put on your own oxygen

mask first." An almost Malthusian fervor gripped the nation, opening the presidency to a long-shot moderate Republican from Texas named William Hurd.

Hurd positioned himself as a Teddy Roosevelt-esque figure, protecting America's children by protecting America's natural resources. He used his legitimacy as the former co-chair of the National Parks Caucus to bring together left-leaning conservationists and right-leaning hunters, while also reviving the Christian environmental stewardship movement. In his speech accepting the Republican nomination, Hurd evoked John Winthrop's "City on a Hill" sermon, lamenting that the world could not behold a city shrouded in smoke. Hurd blended a rugged individualism with Winthrop's command that Americans "must be knit together"—a communitarianism that was made more palatable to right-wing voters by Hurd's staunch refusal to allow "climate migrants" into the country given (he said) his experiences on the Texas border.[68]

Beginning with the historically bipartisan Farm Bill, Hurd assembled a coalition of senators who added funding for voluntary easements and conservation efforts.[69] Next, he built on the former president's Infrastructure Investment and Jobs Act, incentivizing efficiency while investing in carbon-neutral energies like nuclear, wind, and solar.[70] However, conservatives drew the line at international agreements that limited American freedom of action. Instead, congressional Republicans promised a "green dividend" for Americans, redirecting billions in funding that previously went to the United Nations and other international organizations to subsidize sustainable development at home. Despite opposition from the hawkish Hurd, they also redirected much foreign military assistance, including aid to Ukraine and NATO. Within months, Russian forces had overrun Kyiv.

As internationalists bemoaned U.S. retrenchment and the global rise of authoritarianism, American democracy regained some of its vitality as forced migration due to floods and fires redrew the ideological map of the United States, beginning to reverse the so-called "big sort."[71] The imperatives of ecological disaster and the financial rewards of clustering near large eco-infrastructure projects forced a remixing of liberals and conservatives, spawning the saying that "red and blue make green." Culture war dynamics persisted, but they were often sidelined by the unignorable reality of extreme weather and environmental damage and the threat they posed to the most vulnerable population: children.

The decline of us-versus-them politics at home was not matched abroad. The fall of Ukraine cemented the belief that nuclear weapons were the only true guarantor of sovereignty. American conservatives argued that Putin's nuclear threats had deterred the United States from stopping Russian revanchism—even though they had abetted it by withdrawing support for Ukraine. In 2033, after Hurd was succeeded by a more isolationist president, the United States pulled back sharply from its military alliances in both Europe and Asia, withdrawing most troops from both Germany and South Korea. Egged on by an imperiled

defense industry, the new administration claimed it would rely more heavily on missile defenses backed by a "dominant" nuclear arsenal. The city on a hill would become a fortress on a hill. In this, conservatives found common cause with a younger generation of left-wing politicians who wanted to distance themselves from the legacy of America's "forever wars."

These developments, combined with the death of U.S.-Russian arms control following the expiration of New START, triggered a global wave of proliferation, beginning in Poland. In 2023, the United States had refused Poland's request to station nuclear weapons on its soil, at which point Poland "discovered" that it had not, in fact, repatriated all Soviet-era HEU to Russia as previously believed.[72] Struggling to hold NATO together, European nations turned a blind eye to intelligence suggesting Poland was pursuing nuclear weapons, and by 2038 the country had a small deterrent force of last resort. Meanwhile, amid North Korea's continued nuclear-weapons testing and uncertainty about the reliability of the U.S. nuclear umbrella, South Korea embarked on its own nuclear-weapons program.[73] South Korea's nuclearization, the rapid growth of China's arsenal, and North Korea's continued bombast led Japan to build its own deterrent force.[74] After Iran went public with its weapons program, Israel did the same, and Saudi and Turkish programs were not far behind. By 2043, the jump in the number of nuclear-weapon states had created an unstable system, in which the world shuddered into continually shifting alliances of convenience.

These dynamics complicated efforts to develop a new concept of deterrence that addressed the tripolar competition between the United States, China, and Russia. Twenty years earlier, Admiral Charles Richard, then-head of Strategic Command, had said: "[T]here are many passively stable two-body orbital regimes that you can stick stuff in, but there are exactly zero passively stable three-body orbital regimes. They all require active stabilization. And I don't even know what that means when the forces can't be described by physics but are political."[75] Where bilateral agreements between Washington and Moscow had offered a degree of transparency, predictability, and stability, the collapse of the arms control regime and China's nuclear buildup created a situation marked by greater opacity, uncertainty, and precarity. Trilateral negotiations proved impossible.

The resulting great-power arms race left few feeling more secure, and it did little to address the regional power dynamics. The situation did not resemble the three-body problem but an *n*-body problem, whose complexity defied coherent strategic response. Climate change-related tensions drove low-intensity conflicts that had the potential to go nuclear, testing the limits of the stability-instability paradox. As competitions waxed and waned without triggering nuclear use, the tolerance for bluff and brinkmanship increased, but the experienced nuclear-weapons states watched nervously as the new ones demonstrated overconfidence in their ability to control the escalation ladder.[76] By 2043, the potential paths to

nuclear war were constantly shifting. What we could say for certain is that there were more of them—and they were becoming harder to avoid.

Scenario III: Atoms for the Planet

Political Polarization (Less)

Geopolitical Effect of Climate Change (Less Conflict)

In 2024, extreme weather fueled extremism. Hurricane Gordon hit Texas, destroying chunks of the power grid and sending hundreds of thousands of residents fleeing north. The influx of ethnic diversity from Texas into primarily white areas triggered a spate of hate crimes. As President Biden called for unity in the face of natural disasters augmented by climate change, right-wing groups cried that the "climate change hoax" was a stalking horse for lax immigration enforcement. "The libs are stewing us in their 'melting pot,'" a right-wing pundit complained. One U.S. congressman openly called for civil war.[77]

On August 14 at 8:00 a.m. (a reference to the "Fourteen Words" and "88 Precepts" of white supremacist David Lane[78]), extremists launched the worst domestic terrorist attack in U.S. history, bombing three targets: the Foggy Bottom Metro station in Washington (an attack on the "globalists" at the State Department), the Lincoln Memorial (symbol of the Union, emancipation, and the civil rights movement), and the Statue of Liberty (because conspiracy theorists believed Ellis Island was a federal facility for processing the "worst illegals").

The attacks backfired spectacularly. The carnage of the Metro attack—captured by hundreds of phones and security cameras—was nauseating. And the attempted destruction of the two monuments that perhaps best symbolized what remained of a common American identity shook the nation. The Lincoln Memorial, which had been filled with tourists visiting the site before the mid-August heat set in, had served as the stage for a national horror show. One photo showed a young girl, covered in soot, crying on the monument's marble steps, looking over her shoulder for her parents. The picture (which would win a Pulitzer) evoked the sense of a nation searching for itself—only to find a smoking ruin.

Republicans who had tolerated or even supported the January 6 insurrection found themselves in an untenable position. In January 2026, the bipartisan National Commission on the August 14 Attacks released its report, a surprisingly introspective document that grounded the attacks in America's history of right-wing extremism. It concluded that the country had been on the cusp of civil war—and warned that it might still be. The ideological rot went too deep, and the muscles of political cooperation had atrophied greatly. Lest readers miss the point, the commission advocated a Second Reconstruction to reforge a national

identity. As a modest first step—one apropos of the attacks—the commissioners proposed a plan to reconnect the American people with places that represented the best of the American experiment but that were threatened by climate change. They selected 10 sites that symbolized values with broad appeal—ranging from the settlement at Jamestown (exploration) to the Kennedy Space Center (innovation) to Yellowstone National Park (conservation)—and argued that "resilience" must become a national value if we were to preserve America for generations to come.

The attacks had virtually guaranteed that President Biden would win the 2024 election, as the country rallied around the flag and Republicans scrambled to reestablish credibility. When President Biden passed away in 2027 at 85 years old, Vice President Harris stepped into the chief executive position. In the 2028 campaign, Harris extended an olive branch to the right, selecting Miami mayor Francis Suarez, a Republican who had run against Trump, as her running mate.[79] While the choice provoked paroxysms among liberal Democrats who saw the election as a chance to deliver a coup de grâce to the GOP, the move secured Florida's crucial electoral votes, with Sanchez continually emphasizing the millions of dollars the Biden-Harris team had directed toward climate resilience in the state.[80]

The irony was thick. A white-supremacist attack motivated in part by anti-immigrant bias had, at least indirectly, catalyzed the first major-party presidential ticket in U.S. history featuring two first-generation Americans, neither of whom was white.

The next eight years marked a watershed in how the United States managed the climate crisis, emphasizing efficiency, renewable energy, and resilience domestically, while also fulfilling its international obligations. The United States was able to meet its Nationally Determined Contributions to the Paris Agreement, reaching its carbon-free electricity goals on schedule in 2035.[81] Bipartisan agreement freed it to make its contributions to the UN-established Green Climate Fund, which empowered less-developed nations to build infrastructure needed to mitigate the worst impacts of storms and flooding.[82] The Harris-Suarez administration even created a framework to allow immigration from countries threatened by global warming and provided funding and support to preserve languages and cultures threatened by climate change.

The revitalization of climate change cooperation at home gave a boost to climate change efforts abroad, with the United States resuming a leadership role. The previously lacking consistency in U.S. policy through three election cycles created the opportunity for the United States to work with international partners on creating a global infrastructure system to speed decarbonization. As Xi Jinping's claims that democracies can't work together fast enough to effect change were proven wrong, China's leader directed his country to work with the United Nations and Western countries to ensure that it, too, received credit for work to

save the planet. By 2040, an unusual dynamic had emerged whereby the great powers competed to forge cooperative agreements that demonstrated how many nations they could bring to the negotiating table. This, in turn, opened the door for nuclear deals, particularly efforts that complemented the work on climate change.

It was into this hopeful milieu that a contingent of audacious American diplomats revived a century-old idea that had been shelved nearly as soon as it had been conceived. In 1946, Robert Oppenheimer had proposed to Dean Acheson and David Lilienthal the creation of an Atomic Development Authority, which would maintain international control of all uranium mines, nuclear reactors, and laboratories. Now, in a program dubbed Atoms for the Planet, the United States proposed internationalizing the fuel cycle, with uranium mining and enrichment placed under the administrative control of a sister organization to the IAEA, which would monitor the accord. The idea was to facilitate the use of nuclear power to speed decarbonization, while radically reducing reliance on Russian uranium and limiting proliferation risk.

The plan foundered on Russian opposition and Chinese hesitance, leading to the interim AUCUS accord, in which Australia, Canada, and the United States (which, combined, control an estimated 39 percent of the world's uranium reserves) established a consortium that offered nuclear fuel at below-market prices to states willing to forgo or dismantle their own nuclear fuel-cycle capabilities. Although Atoms for the Planet remained a distant goal, the success of the interim deal had an interesting side effect: It revived discussions of international arms control agreements, whose failure in the 2020s had led the United States, Russia, and China to all increase the size of their deployed arsenals. As Washington and Beijing opened talks to limit the arms race, an increasingly isolated and economically desperate Russia asked for a seat at the table. For the first time in decades, the prospects of nuclear stability seemed brighter.

Scenario IV: The Fog of Life

Political Polarization (More)

Geopolitical Effect of Climate Change (Less Conflict)

U.S. political polarization regarding climate change began to recede in 2024 when the Southeast was relentlessly inundated by storms, destroying houses and livelihoods in regions already suffering economically. In the last months before the election, the Biden administration did its best to manage the catastrophe, but it made enough missteps to tarnish the Democratic ticket and ensure Donald Trump's reelection. When Trump died of natural causes shortly after taking

office, his vice president, Elise Stefanik, the New York representative who had chaired the House Republican Conference, became America's first female president—and an unlikely bridge-builder.[83] Unassailable from the right given her loyalty to Trump, she was also a member of the ConservAmerica Caucus and the Climate Solutions Caucus—able to convince moderates of her green bona fides through her votes to rejoin the Paris Accord and protect the Arctic National Wildlife Refuge.[84]

The first few months of 2025 were an exercise in futility for the newly elected president, who faced an unhappy progressive caucus and an even unhappier far-right coalition, until Senator Mark Kelly, the former astronaut, asked if she was familiar with the "overview effect." The overview effect is the cognitive shift that occurs when humans see Earth from space and reflect on the fragility of life.[85] In 2026, Stefanik and Kelly worked with the nonprofit Space for Humanity to send six legislators into orbit to see what we stand to lose if we fail to face the existential threat of climate change—a CODEL (Congressional Member Delegation) to space. The plan succeeded, with the new legislator-astronauts becoming evangelists for bipartisan collaboration, if only on climate. Over the next five years, Space for Humanity, with help from Elon Musk's SpaceX, took 45 lawmakers into space.

President Stefanik used the spread of the overview effect through Congress, combined with recent interest in a carbon tax and the desire to revitalize the U.S. nuclear power industry, to catalyze change.[86] The Stefanik administration built on the financial and regulatory assistance implemented in the prior two administrations by streamlining the application and licensing process for new nuclear plants and by connecting nuclear-power providers with federal funding. In addition, President Stefanik issued a challenge: If a company could build and turn on a nuclear power plant on schedule and within 10 percent of its original budget, its tax credit under the Inflation Reduction Act would be increased from 30 percent to 50 percent. Producers of small modular reactors (SMRs) like NuScale, Bill Gates's TerraPower, and Westinghouse Electric Company now had the runway they needed to bring their products to market.

Empowering industry gave Stefanik enough political goodwill among the Republican Congress that the United States could participate in global climate change mitigation efforts in good faith. Over the eight years of Stefanik's presidency, the United States was able to meet its Nationally Determined Contributions to the Paris Agreement by 2030 and its carbon-free electricity goals in 2032, three years ahead of schedule. With the United States proving that a large carbon emitter could use nuclear power to quickly move toward net-zero emissions without slowing economic productivity, international demand for SMRs grew, and the U.S. nuclear industry was able to tap a $500 billion global market while hastening decarbonization.

China, displeased by the groundswell of support for the United States, moved up its carbon-neutrality timeline to 2045 from 2060. As the world's largest producer of carbon emissions, solar panels, and electric vehicle batteries, China's decarbonization push increased access to panels and batteries for the rest of the world, creating a virtuous cycle that brought more solar power online earlier than expected.

Unfortunately, domestic cooperation in the United States on climate change did not extend to other policy areas. If anything, polarization on domestic issues deepened as advances in artificial intelligence and the proliferation of deep-fakes and misinformation deepened the nation's epistemic crisis. Even savvy citizens often had a difficult time determining what was true, effectively cloaking every day in a "fog of life" where no one was sure what was real. Without a common "truth," Americans retreated ever deeper into their ideological corners. The same was true of lawmakers. Those who had been to orbit had been able to trust what they saw with their own eyes—the Earth was a fragile sanctuary in the darkness of space—but that dynamic did not extend to social or economic issues. And, with the exception of climate change measures to protect the planet, their willingness to "subordinate American interests to world government" did not recede, particularly when it came to nonproliferation and arms control.

If anything, the opposite was true. The number of new reactors built around the world during the SMRenaissance had led to an increase in the number of enrichment facilities, taxing IAEA resources. It became difficult to monitor the nuclear fuel cycle, and the risk of breakout increased among the newly nuclear-empowered. In the United States, more hawkish policymakers used this risk to secure funding for more robust missile defenses, more advanced precision-strike weapons, and new low-yield nuclear weapons. More dovish policymakers argued that more weapons were a silly response to proliferation given the size of the U.S. nuclear arsenal, which was completing a 30-year $1.5 trillion modernization effort. Meanwhile, Russia and China accused the United States of making a thinly veiled bid for escalation dominance and accelerated their own defense programs. Absent the transparency provided by arms control and confidence-building measures, the risk of accidental escalation increased, amplified by the global spread of misinformation.

Ultimately, the threat of nuclear conflict came to a head not among the great powers or even among the new nuclear states, but between India and Pakistan. One of the 10 nations most vulnerable to the effects of climate change, Pakistan had taken full advantage of the global push to nuclearize power, while expanding its indigenous enrichment facilities. Worried that Pakistan was expanding its nuclear arsenal, India called for international oversight, but Pakistan replied that India was simply trying to draw attention from the suffering it had inflicted on the Pakistani people by being one of the world's top carbon emitters. Although U.S. intelligence agencies shared India's concerns, few American policymakers

prioritized the issue, and since neither India nor Pakistan was party to the Nonproliferation Treaty, India had little international recourse.

Frustrated, India moved more troops to Kashmir, and in 2042, a border skirmish erupted—a situation that might have been controllable but for the circulation of a video purporting to show Indian troops desecrating the corpses of Pakistani soldiers. It was later discovered that extremists had used generative AI to produce the footage, but not before the conflict had escalated to the brink of a nuclear exchange. As Pakistani troops launched an offensive on Indian forces—and as the more powerful Indian military waged a successful counteroffensive—the combination of outrage and fear among Pakistani decision-makers made the employment of tactical nuclear weapons almost inevitable. The "fog of life" had thickened the "fog of war."

Notes

1 *2022 National Defense Strategy of the United States of America* (Washington, DC: U.S. Department of Defense, October 2022), 22, https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF.

2 Herman Kahn, *On Thermonuclear War* (Princeton, NJ: Princeton University Press, 1960), 162.

3 Nandita Bose, "Biden Cites Cuban Missile Crisis in Describing Putin's Nuclear Threat," Reuters, October 6, 2022, https://www.reuters.com/world/biden-cites-cuban-missile-crisis-describing-putins-nuclear-threat-2022-10-07/.

4 John Mecklin, "A Time of Unprecedented Danger: It Is 90 Seconds to Midnight," Bulletin of the Atomic Scientists, January 24, 2023, https://thebulletin.org/doomsday-clock/current-time/.

5 "Will Russia Detonate a Nuclear Weapon in Ukraine Before 2024?" Metaculus, October 21, 2022, https://www.metaculus.com/questions/13171/nuclear-detonation-in-ukraine-by-2024/.

6 *National Security Strategy* (Washington, DC: The White House, 2022), https://www.whitehouse.gov/wp-content/uploads/2022/10/Biden-Harris-Administrations-National-Security-Strategy-10.2022.pdf.

7 *2022 National Defense Strategy of the United States of America*, 7, https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF.

8 Thomas C. Schelling, "The Role of War Games and Exercises," in *Managing Nuclear Operations*, ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington, DC: Brookings Institution, 1987), 426-444.

9 Daniel Kahneman and Gary Klein, "Conditions for Intuitive Expertise: A Failure to Disagree," *American Psychologist* 64, no. 6 (2009): 515-26.

10 Anjli Raval, "The Age of Uncertainty for CEOs," *Financial Times*, September 19, 2022, https://www.ft.com/content/ecbd3ce4-e92e-49c5-bfad-1c509f73fe87; "The Age of Uncertainty," *Foreign Affairs* 101, no. 5 (September/October 2022), https://www.foreignaffairs.com/issues/2022/101/5; Nathan Furr, "Strategy in an Age of Uncertainty," *Harvard Business Review*, June 27, 2022, https://hbr.org/2022/06/strategy-in-an-age-of-uncertainty.

11 United Nations Development Programme, *Unsettled Lives: Shaping our Future in a Transforming World: Human Development Report 2021-22* (New York: United Nations, 2022), https://hdr.undp.org/content/human-development-report-2021-22.

12 Hites Ahir, Nicholas Bloom, and Davide Furceri, *The World Uncertainty Index*, no. w29763 (Cambridge, MA: National Bureau of Economic Research, February 2022), https://www.nber.org/system/files/working_papers/w29763/w29763.pdf.

13 Francis J. Gavin, "I Was Wrong. Now What?" *Texas National Security Review* (Summer 2022), https://tnsr.org/2022/07/i-was-wrong-now-what/.

14 Philip E. Tetlock, *Expert Political Judgment: How Good Is It? How Can We Know?* (Princeton, NJ: Princeton University Press, 2005).

15 Francis J. Gavin, *Nuclear Weapons and American Grand Strategy* (Washington, DC: Brookings Institution Press, 2020), 70.

16 Paul C. Avey and Michael C. Desch, "The Bumpy Road to a 'Science' of Nuclear Strategy," in *Bridging the Theory-Practice Divide in International Relations*, ed. Daniel Maliniak, et al. (Washington, DC: Georgetown University Press, 2020), 205-24.

17 Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons*

(Princeton, NJ: Princeton University Press, 1993); Eric Schlosser, *Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety* (New York: The Penguin Press, 2013).

18 See, for example, Serhii Plokhy, *Nuclear Folly: A History of the Cuban Missile Crisis* (New York: W.W. Norton & Company, 2021).

19 Yuen Foong Khong, *Analogies at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965* (Princeton, NJ: Princeton University Press, 1992); Richard E. Neustadt and Ernest R. May, *Thinking in Time: The Uses of History for Decision-Makers* (New York: Free Press, London, 1986); J. Peter Scoblic, "Seeing so Much of the Present through Watergate Makes It Harder to See the Future," *Washington Post*, October 6, 2017, https://www.washingtonpost.com/outlook/seeing-so-much-of-the-present-through-watergate-makes-it-harder-to-see-the-future/2017/10/06/e5cec4d8-8d05-11e7-84c0-02cc069f2c37_story.html.

20 Robert A. Levine, *The Strategic Nuclear Debate* (Santa Monica, CA: RAND Corporation, 1987), v.

21 Tetlock, *Expert Political Judgment,* xii.

22 Gavin, *Nuclear Weapons and American Grand Strategy*, 149.

23 Paul C. Avey, "Just Like Yesterday? New Critiques of the Nuclear Revolution," *Texas National Security Review* 6, no. 2 (Spring 2023), 31, https://tnsr.org/2023/04/just-like-yesterday-new-critiques-of-the-nuclear-revolution/.

24 Mary Beth D. Nikitin, "North Korea's Nuclear Weapons and Missile Programs," Congressional Research Service, *In Focus* IF10472, July 21, 2023, https://crsreports.congress.gov/product/pdf/IF/IF10472/29.

25 Paul K. Kerr, "Iran and Nuclear Weapons Production," Congressional Research Service, *In Focus* IF12106, https://crsreports.congress.gov/product/pdf/IF/IF12106.

26 *Military and Security Developments Involving the People's Republic of China* (Washington, DC: U.S. Department of Defense, 2000), 97-98, https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF.

27 Nicholas L. Miller and Vipin Narang, "Is a New Nuclear Age Upon Us? Why We May Look Back on 2019 as the Point of No Return," *Foreign Affairs*, December 30, 2019, https://www.foreignaffairs.com/united-states/new-nuclear-age-upon-us; Andrew F. Krepinevich Jr., "The New Nuclear Age," *Foreign Affairs*, April 19, 2022, https://www.foreignaffairs.com/articles/china/2022-04-19/new-nuclear-age.

28 Vipin Narang and Scott D. Sagan, "Introduction" in *The Fragile Balance of Terror Deterrence in the New Nuclear Age,* ed. Vipin Narang and Scott D. Sagan (Ithaca, NY: Cornell University Press, 2023), 2.

29 Theresa Hitchens, "The Nuclear 3 Body Problem: STRATCOM 'Furiously' Rewriting Deterrence Theory in Tripolar World," Breaking Defense, August 11, 2022, https://breakingdefense.com/2022/08/the-nuclear-3-body-problem-stratcom-furiously-rewriting-deterrence-theory-in-tri-polar-world/; "How Will America Deal with Three-Way Nuclear Deterrence?" *The Economist*, November 29, 2022, https://www.economist.com/united-states/2022/11/29/how-will-america-deal-with-three-way-nuclear-deterrence; William J. Broad, "The Terror of Threes in the Heavens and on Earth," *New York Times*, June 26, 2023, https://www.nytimes.com/2023/06/26/science/3-body-problem-nuclear-china.html; Andrew F. Krepinevich Jr., "The New Nuclear Age: How China's Growing Nuclear Arsenal Threatens Deterrence," *Foreign Affairs*, April 19, 2022, https://www.foreignaffairs.com/articles/china/2022-04-19/new-nuclear-age.

30 Background interview with author, December 18, 2020.

31 Robert Wiblin (host) and Jeffrey Lewis, "Jeffrey Lewis on the Most Common Misconceptions About Nuclear Weapons," *80,000 Hours*, podcast, December 29, 2022, https://80000hours.org/podcast/episodes/jeffrey-lewis-common-misconceptions-about-nuclear-weapons/.

32 Given my memory's limitations and Janne's death in 2019, I have paraphrased.

33 J. Peter Scoblic, "Disarmament Redux," *Bulletin of the Atomic Scientists* 64, no. 1 (March 1, 2008), 34-39, https://thebulletin.org/2008/03/disarmament-redux/.

34 George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, "A World Free of Nuclear Weapons," *Wall Street Journal*, January 4, 2007, https://www.wsj.com/articles/SB116787515251566636.

35 William J. Broad and David E. Sanger, "Obama's Youth Shaped His Nuclear-Free Vision," *New York Times*, July 4, 2009, https://www.nytimes.com/2009/07/05/world/05nuclear.html.

36 Barack Obama, "Remarks By President Barack Obama In Prague As Delivered," The White House, April 5, 2009, https://obamawhitehouse.archives.gov/the-press-office/remarks-president-barack-obama-prague-delivered.

37 "The Nobel Peace Prize 2009 Barack H. Obama, press release," The Nobel Prize, October 9, 2009, https://www.nobelprize.org/prizes/peace/2009/press-release/.

38 See, for example, Kenneth Craik, *The Nature of Explanation* (Cambridge, UK: Cambridge University Press, 1943); Jay W. Forrester, "Counterintuitive Behavior of Social Systems," *Technology Review* 73, no. 3 (January 1971), 52-68; Philip Johnson-Laird, *Mental Models: Towards a Cognitive Science of Language, Inference, and Consciousness* (Cambridge, MA: Harvard University Press, 1983).

39 Heather Williams, "The Non-Existent Nuclear Weapons Debate," *The Interpreter*, February 4, 2016, https://www.lowyinstitute.org/the-interpreter/non-existent-nuclear-weapons-debate.

40 Herman Kahn, *On Escalation: Metaphors and Scenarios* (Westport, CT: Praeger, 1986).

41 Bretton Fosbrook, "How Scenarios Became Corporate Strategies: Alternative Futures and Uncertainty in Strategic Management" (Toronto, Canada: York University, 2017); Art Kleiner, *The Age of Heretics: A History of the Radical Thinkers Who Reinvented Corporate Management*, 2nd ed. (San Francisco: Jossey-Bass, 2008).

42 Pierre Wack, "Scenarios: Shooting the Rapids," *Harvard Business Review* 63, no. 6 (1985): 139-50.

43 Kees Van der Heijden, *Scenarios: The Art of Strategic Conversation* (New York: John Wiley & Sons, 1996).

44 *National Security Strategy*, https://www.whitehouse.gov/wp-content/uploads/2022/10/Biden-Harris-Administrations-National-Security-Strategy-10.2022.pdf.

45 *Military and Security Developments Involving the People's Republic of China,* https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF.

46 Matthew Bunn, "A Mathematical Model of the Risk of Nuclear Terrorism," *The Annals of the American Academy of Political and Social Science* 607, no. 1 (2006): 107, https://journals.sagepub.com/doi/abs/10.1177/0002716206290182.

47 Graham T. Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Times

Books/Henry Holt, 2004); see also Graham Allison, "Nuclear Terrorism: Did We Beat the Odds or Change Them?" *PRISM* 7, no. 3 (May 15, 2018), https://cco.ndu.edu/News/Article/1507316/nuclear-terrorism-did-we-beat-the-odds-or-change-them/.

48 Hitchens, "The Nuclear 3 Body Problem," https://breakingdefense.com/2022/08/the-nuclear-3-body-problem-stratcom-furiously-rewriting-deterrence-theory-in-tri-polar-world/.

49 Schelling, "The Role of War Games and Exercises," 426–444.

50 Herman Kahn, *Thinking About the Unthinkable* (New York: Horizon Press, 1962), 157.

51 See, for example, Fred Kaplan, *The Bomb: Presidents, Generals, and the Secret History of Nuclear War* (New York: Simon & Schuster, 2020), which describes how two sets of Obama administration officials devised two courses of action —one using nuclear weapons and one not—in response to a hypothetical Russian invasion of the Baltics.

52 Heather Williams, Kelsey Hartigan, Joseph Rodgers, and Reja Younis, *Alternative Nuclear Futures: Capability and Credibility Challenges for U.S. Extended Nuclear Deterrence* (Washington, DC: Center for Strategic and International Studies, May 2023), https://www.csis.org/analysis/alternative-nuclear-futures-capability-and-credibility-challenges-us-extended-nuclear; Jonathan Lord, Arona Baigal, Hunter Streling, and Stewart Latwin, "Disarming the Bomb Distilling the Drivers and Disincentives for Iran's Nuclear Program," Center for a New American Security, March 29, 2023, https://www.cnas.org/press/press-release/disarming-the-bomb-distilling-the-drivers-and-disincentives-for-irans-nuclear-program; Andrew F. Krepinevich and Jacob Cohn, *Rethinking Armageddon: Scenario Planning in the Second Nuclear Age* (Washington, DC: Center for Strategic and Budgetary Assessments, 2016), https://csbaonline.org/research/publications/rethinking-armageddon; *Crossroads: Five Scenarios for Ending Nuclear Weapons* (Washington, DC: N Square, December 16, 2022), https://issuu.com/nsquarecollab/docs/nsquare_crossroads_ae06fce734fbbd.

53 Reid BC Pauly, "Would US Leaders Push the Button? Wargames and the Sources of Nuclear Restraint," *International Security* 43, no. 2 (Fall 2018): 151–192, https://www.belfercenter.org/publication/would-us-leaders-push-button-wargames-and-sources-nuclear-restraint. Stacie Pettyjohn and Hannah Dennis, *Avoiding the Brink: Escalation Management in a War to Defend Taiwan* (Washington, DC: Center for a New American Security, 2023) https://www.cnas.org/publications/reports/avoiding-the-brink.

54 Erik Lin-Greenberg, Reid BC Pauly, and Jacquelyn G. Schneider, "Wargaming for International Relations Research," *European Journal of International Relations* 28, no. 1 (2022): 83-109, https://journals.sagepub.com/doi/full/10.1177/13540661211064090.

55 Karina Tsui, "The Middle East Is Warming Up Twice as Fast as the Rest of the World," *Washington Post*, September 7, 2022, https://www.washingtonpost.com/world/2022/09/07/middle-east-mediterranean-climate-change/; Scott Dance, "The Heat Index Reached 152 Degrees in the Middle East—Nearly at the Limit for Human Survival," *Washington Post*, July 18, 2023, https://www.washingtonpost.com/weather/2023/07/18/extreme-heat-record-limits-human-survival/.

56 Samantha Kuzma, Liz Saccoccia, and Marlena Chertock, "25 Countries, Housing One-Quarter of the Population, Face Extremely High Water Stress," World Resources Institute, August 16, 2023, https://www.wri.org/insights/highest-water-stressed-countries.

57 Thomas Anselain, et al., "Qatar Peninsula's Vulnerability to Oil Spills and its Implications for the Global Gas Supply," *Nature Sustainability* 6 (2023), 273–283, https://www.nature.com/articles/s41893-022-01037-w.

58 Edward Wong, Vivian Nereim, and Kate Kelly, "Inside Saudi Arabia's Global Push for Nuclear Power," *New York Times*, April 1, 2023, https://www.nytimes.com/2023/04/01/us/politics/saudi-arabia-nuclear-biden-administration.html; See also: Christopher M. Blanchard and Paul K. Kerr, "Prospects for U.S.-Saudi Nuclear Energy Cooperation," Congressional Research Service, *In Focus*, IF10799 (June 9, 2023), https://crsreports.congress.gov/product/pdf/IF/IF10799.

59 Joseph Webster and Joze Pelayo, "China Is Getting Comfortable with the Gulf Cooperation Council. The West Must Pragmatically Adapt to Its Growing Regional Influence," The Atlantic Council, April 5, 2023, https://www.atlanticcouncil.org/blogs/menasource/china-is-getting-comfortable-with-the-gulf-cooperation-council-the-west-must-pragmatically-adapt-to-its-growing-regional-influence.

60 In 2018, Trump announced he would withdraw 12,000 troops from Germany—a move that Biden halted days after taking office. Phil Stewart and Idrees Ali, "U.S. to Withdraw about 12,000 Troops from Germany but Nearly Half to Stay in Europe," Reuters, July 29, 2020, https://www.reuters.com/article/us-usa-trump-germany-military/u-s-to-withdraw-about-12000-troops-from-germany-but-nearly-half-to-stay-in-europe-idUSKCN24U20L; Helene Cooper, "Biden Freezes Trump's Withdrawal of 12,000 Troops From Germany," *New York Times*, February 4, 2021, https://www.nytimes.com/2021/02/04/us/politics/biden-germany-troops-trump.html.

61 Paul K. Kerr, "Iran and Nuclear Weapons Production," Congressional Research Service, *In Focus*, IF12106, April 14, 2023, https://crsreports.congress.gov/product/pdf/IF/IF12106.

62 Golnar Motevalli, "Inside the Deadly Water Crisis Threatening Iran's Leadership," *Bloomberg*, December 19, 2021, https://www.bloomberg.com/news/features/2021-12-19/climate-change-exposes-iran-s-political-failures. China's move in this scenario would echo its veto of sanctions proposed against the Democratic People's Republic of Korea in 2022, when China's envoy claimed that new measures would be inhumane given the COVID-19 pandemic. See: Margaret Besheer, "China, Russia Called to Explain DPRK Veto at UN," *VOA News*, June 8, 2022, https://www.voanews.com/a/china-russia-called-to-explain-dprk-veto-at-un-/6608585.html.

63 Senior Saudi officials have stated that if Iran were to obtain a nuclear weapon, Saudi Arabia would weaponize its currently peaceful nuclear program. Blanchard & Kerr, "Prospects for U.S.-Saudi Nuclear Energy Cooperation," https://crsreports.congress.gov/product/pdf/IF/IF10799.

64 United Nations Development Programme, *State of Environment and Outlook Report for the Occupied Palestinian Territory 2020* (Nairobi, Kenya: United Nations Environment Programme, 2020).

65 "Israel's Deployment of Nuclear Missiles on Subs from Germany," *Spiegel International*, July 4, 2012, https://www.spiegel.de/international/world/israel-deploys-nuclear-weapons-on-german-built-submarines-a-836784.html.

66 Ben Fox and Hannah Fingerhut, "Nuclear Fears in US Amid Russia-Ukraine War: AP-NORC Poll," Associated Press, March 28, 2022, https://apnews.com/article/russia-ukraine-putin-europe-cold-war-nato-c0acbb51f5fda41475287a4113ada3fd.

67 "Antisemitic Conspiracy Theories Abound Around Russian Assault on Ukraine," Anti-Defamation League, March 09, 2022, https://www.adl.org/resources/blog/antisemitic-conspiracy-theories-abound-around-russian-assault-ukraine.

68 Will Hurd, "Immigration News You Aren't Getting: How Bad Border Security Has Gotten and Real Fixes Needed to Immigration Reform." WillBHurd.com (blog), April 20, 2023, https://www.willbhurd.com/immigration-news-you-arent-getting/.

69 Adam Aton, "Congress' 'Biggest Fight' Over Climate? It's the Farm Bill," *E&E News*, February 1, 2023, https://www.eenews.net/articles/congress-biggest-fight-over-climate-its-the-farm-bill/.

70 Will Hurd, "The Best Energy Policy Begins with Us Not Listening to Nuts." WillBHurd.com (blog), August 8, 2022, https://www.willbhurd.com/the_best_energy_policy_begins_with_us_not_listening_to_nuts/.

71 Bill Bishop, *The Big Sort: Why the Clustering of Like-Minded American is Tearing Us Apart* (Boston, MA: Houghton Mifflin Harcourt, 2008), https://www.amazon.com/Big-Sort-Clustering-Like-Minded-America/dp/0547237723; Nicholas Riccardi, "Conservatives Go to Red States and Liberals Go to Blue as The Country Grows More Polarized," Associated Press, July 5, 2023, https://apnews.com/article/polarization-republicans-democrats-abortion-gender-colorado-idaho-406b5a841d4d47c8a08cf054c38bb2a0.

72 Andrew Bieniawski, "Poland HEU Removal: Behind the Scenes," *Atomic Pulse* (blog), Nuclear Threat Initiative, October 24, 2016, https://www.nti.org/atomic-pulse/poland-heu-removal-behind-scenes/.

73 Mark Green, "Seventy-One Percent of South Koreans Now Support the Return of Nuclear Weapons to Their Country—Even if it Means Developing Their Own," *Stubborn Things* (blog), Wilson Center, January 31, 2023, https://www.wilsoncenter.org/blog-post/seventy-one-percent-south-koreans-now-support-return-nuclear-weapons-their-country-even; Jean Mackenzie, "Nuclear Weapons: Why South Koreans Want the Bomb," *BBC News*, April 21, 2023, https://www.bbc.com/news/world-asia-65333139.

74 John T. Deacon and Etel Solingen, "Japan's Nuclear Weapon Dilemma Growing More Acute," *Asia Times*, June 1, 2023, https://asiatimes.com/2023/06/japans-nuclear-weapon-dilemma-growing-more-acute/.

75 Theresa Hitchens, "The Nuclear 3 Body Problem: STRATCOM 'Furiously' Rewriting Deterrence Theory In Tripolar World," Breaking Defense, August 11, 2022, https://breakingdefense.com/2022/08/the-nuclear-3-body-problem-stratcom-furiously-rewriting-deterrence-theory-in-tri-polar-world/.

76 Nicholas L. Miller and Vipin Narang, "Is a New Nuclear Age Upon Us?" *Foreign Affairs*, December 30, 2019, https://www.foreignaffairs.com/united-states/new-nuclear-age-upon-us.

77 Thomas Zeitzoff, "'Idiots,' 'Criminals' and 'Scum'—Nasty Politics Highest in US since the Civil War," *The Conversation*, July 10, 2023, http://theconversation.com/idiots-criminals-and-scum-nasty-politics-highest-in-us-since-the-civil-war-208272.

78 "14 Words," Anti-Defamation League, July 5, 2023, https://www.adl.org/resources/hate-symbol/14-words.

79 Sabrina Rodriguez, "The Trump-Rejecting Florida Republican Who Has a Plan to Fix the GOP," *Politico*, April 28, 2021, https://www.politico.com/news/2021/04/28/trump-florida-republican-fix-gop-484807.

80 Maggie Astor, et al., "Where the Republican Candidates Stand on Climate Change," *New York Times*, June 8, 2023, https://www.nytimes.com/2023/06/08/us/politics/wildfires-republicans-climate-change.html; Nathan Crooks, "Miami's Three Mayors Bridge Partisan Divide With Climate Stance," *Bloomberg*, May 11, 2022, https://www.bloomberg.com/news/articles/2022-05-11/miami-s-three-mayors-bridge-partisan-divide-with-climate-stance#xj4y7vzkg; "Biden-Harris Administration Recommends Funding of $78.7 Million for Projects in Florida to Strengthen Climate-Ready Coasts as Part of Investing in America Agenda," National Oceanic and Atmospheric Administration, April 21, 2023, https://www.noaa.gov/news-release/noaa-bil-investments-2023-florida.

81 "Reducing Greenhouse Gases in the United States: A 2030 Emissions Target," The United States Nationally Determined Contribution, United Nations Framework Convention on Climate Change, April 2021, https://unfccc.int/sites/default/files/NDC/2022-06/United%20States%20NDC%20April%2021%202021%20Final.pdf.

82 "The Green Climate Fund Welcomes US Contribution of USD 1 Billion," Green Climate Fund, April 20, 2023, https://www.greenclimate.fund/news/green-climate-fund-welcomes-us-contribution-usd-1-billion.

83 Brett Samuels, "Trump Speaks with Stefanik as GOP Moves Forward With Biden Impeachment Inquiry," *The Hill*, September 12, 2023, https://thehill.com/homenews/house/4200752-trump-stefanik-speak-house-gop-biden-impeachment-inquiry/.

84 Simone Pathé, "Here Are the 3 Republicans Who Bucked Trump on the Paris Climate Accord," *Roll Call*, May 2, 2019, https://rollcall.com/2019/05/02/here-are-the-3-republicans-who-bucked-trump-on-the-paris-climate-accord/; Aaron Cerbone, "Stefanik Signs Letter Opposing Alaskan Oil Drilling," *Adirondack Daily Enterprise*, December 5, 2017, https://www.adirondackdailyenterprise.com/news/local-news/2017/12/stefanik-signs-letter-opposing-alaskan-oil-drilling/.

85 "Our Mission," Space for Humanity, Accessed July 6, 2023, https://spaceforhumanity.org/our-mission.

86 Maxine Joselow, "A Bipartisan Plan to Punish Global Climate Laggards: Tax Them," *Washington Post*, June 7, 2023, https://www.washingtonpost.com/climate-environment/2023/06/07/carbon-border-tax/; *Restoring America's Competitive Nuclear Energy Advantage: A Strategy to Assure U.S. National Security* (Washington, DC: U.S. Department of Energy, 2020), https://www.energy.gov/articles/restoring-americas-competitive-nuclear-energy-advantage.

NEW AMERICA