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Brendan Rittenhouse Green. *The Revolution that Failed: Nuclear Competition, Arms Control, and the Cold War.* New York: Cambridge University Press, 2020. ISBN: 9781108489867 (hardback, \$39.99)

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Contents

Introduction by Caitlin Talmadge, Georgetown University	2
Review by Fiona S. Cunningham, George Washington University	5
Review by Charles L. Glaser, George Washington University.....	10
Review by Vipin Narang, The Massachusetts Institute of Technology	16
Review by Marc Trachtenberg, University of California, Los Angeles.....	20
Response by Brendan Rittenhouse Green, University of Cincinnati and Cato Institute	23

 INTRODUCTION BY CAITLIN TALMADGE, GEORGETOWN UNIVERSITY

Do nuclear weapons revolutionize world politics? For decades, the standard answer from international relations scholars has been a resounding yes. This mainstream view, known as ‘The Theory of the Nuclear Revolution,’ is associated with scholars such as Kenneth Waltz, Robert Jervis, and Charles Glaser.¹ It argues that nuclear weapons generate a condition of mutual vulnerability that stalemates the military balance, makes further competition pointless and irrational, and generally pacifies the international system.

Brendan Rittenhouse Green’s revisionist account, *The Revolution that Failed: Nuclear Competition, Arms Control, and the Cold War*, challenges these claims by taking up a central puzzle of the late Cold War: if there is no point to nuclear competition once both sides have large nuclear forces, then why did the Soviet Union and especially the United States behave otherwise in the period 1969-79? In short, why did the two superpowers arms race, when they were supposedly locked in a condition of mutual nuclear vulnerability that made such a race futile?

Boiled down to its essentials, Green’s answer is that nuclear competition pays. According to Green’s ‘Delicate Nuclear Balance Theory,’ nuclear stalemate is much more fragile and ephemeral than the Nuclear Revolution theory assumes. As a result, states have rational reasons to compete for nuclear advantages that could strengthen general deterrence, confer crisis bargaining leverage, reassure allies, and exert long-term pressure on an opponent’s resources. Thus, the late Cold War arms race was not the crazy product of parochial domestic forces, such as aggressive military organizations run amok of civilian control, as is commonly portrayed in the work of Nuclear Revolution theory scholars. Rather, the arms race reflected political leaders’ sober pursuit of the strategic advantages that were enabled by the delicacy of the nuclear balance—the latter concept being one that Green imports, refines, and leverages from Albert Wohlstetter.² Green offers a theory of how different types of states will pursue such advantages depending on their given strengths and weaknesses, which he calls their comparative constitutional fitness. This theory correctly predicts that U.S. leaders would want to leverage U.S. strengths in technology to engage in a qualitative arms race and explains why the United States was actually quite interested in capping quantitative competition through arms control.

The four reviewers, each one of whom is a distinguished scholar of nuclear deterrence, laud Green’s volume as a major contribution to the field of international relations.³ Marc Trachtenberg offers unstinting praise of the book’s theory, method, and empirics, which include both detailed technical analysis of the Cold War nuclear balance as well as archival research from multiple presidential libraries. Calling the book “convincing” and “important,” Trachtenberg predicts that

¹ As representative examples of their work, see Kenneth N. Waltz, “More May Be Better,” in Scott Douglas Sagan and Kenneth N. Waltz, ed., *The Spread of Nuclear Weapons: An Enduring Debate* (New York: W.W. Norton, 2013); Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca: Cornell University Press, 1989); Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton: Princeton University Press, 1990).

² Albert Wohlstetter, “The Delicate Balance of Terror,” *Foreign Affairs* 37:2 (January 1959): 211-234.

³ As representative examples of their work, see Marc Trachtenberg, *History and Strategy* (Princeton: Princeton University Press, 1991); Trachtenberg, *A Constructed Peace: The Making of the European Settlement, 1945-1963* (Princeton: Princeton University Press, 1999); Fiona S. Cunningham and M. Taylor Fravel, “Assuring Assured Retaliation: China’s Nuclear Posture and U.S.-China Strategic Stability,” *International Security* 40:2 (Fall 2015): 7–50; Cunningham and M. Taylor Fravel, “Dangerous Confidence? Chinese Views on Nuclear Escalation,” *International Security* 44:2 (Fall 2019): 61–109; Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton: Princeton University Press, 2014); Christopher Clary and Narang, “India’s Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities,” *International Security* 43:3 (2018): 7-52; Charles L. Glaser, *Analyzing Strategic Nuclear Policy*; Glaser and Steve Fetter, “Counterforce Revisited: Assessing the Nuclear Posture Review’s New Missions,” *International Security* 30:2 (2005): 84-126; Glaser and Steve Fetter, “Should the United States Reject MAD?: Damage Limitation and U.S. Nuclear Strategy toward China,” *International Security* 41:1 (Summer 2016): 49-98.

the book's implications will be "far-reaching." In a similarly enthusiastic essay, Vipin Narang calls *The Revolution that Failed* "the best book on late Cold War American nuclear strategy in thirty years," "a devastating strike on the logic and empirics of the Theory of the Nuclear Revolution," and "a landmark book that challenges some of the core assumptions of the nuclear field." Narang recommends its inclusion in the canon of foundational books on nuclear deterrence. Meanwhile, Fiona Cunningham describes the book as "compelling," with "nuanced theoretical arguments and meticulous empirical analysis." And Charles Glaser, whose own scholarship Green directly challenges in the book, nevertheless characterizes the book as "excellent," "impressive," and "sophisticated." As Glaser writes in his fair and thoughtful review, "Although I disagree with some of [Green's] arguments, *The Revolution that Failed* succeeds in significantly advancing the nuclear debate."

Several themes emerge from the reviewers' deep engagement with the book. On the theoretical side, Glaser, Cunningham, and to a certain extent Narang all push Green on the logic of several aspects of his theory. These include whether there really is any such thing as a nuclear advantage once both sides have large forces and whether nuclear competition can really be as rational in most situations as the book suggests. Related to this, Narang and Cunningham both raise the question of how well Green's theory travels beyond the U.S. case. For example, what can the theory tell us about nuclear-decision-making in China, India, or the Soviet Union? Is this ultimately a book reflecting certain peculiarities of the United States, or can it tell us important things about nuclear decision-making in other countries? Ultimately, both Glaser and Cunningham resist Green's overall claim that the Nuclear Revolution has "failed," per the book's title, instead contending that the theory still explains a great deal of state behavior in the post-1945 age, even if the theory may need some tweaks or revisions.

On the empirical side, Glaser pushes Green the hardest on the evidence. He suggests that the nuclear balance during the Cold War was not as delicate as Green claims. He also expresses dissatisfaction with the specificity of Green's archival evidence regarding the role of military organizations versus civilian political leaders in driving the arms race. On this point, Glaser concludes that the book still "underestimate[s] the impact of military interests and influence on U.S. arms control policy" and that "the largely unwavering civilian support for counterforce remains a puzzle" that the book has not resolved.

Green takes up this and the other queries of the reviewers in a thorough reply. Among his most important points—especially at a time when the United States and Russia are re-engaging in strategic stability talks, and China appears to be rapidly expanding its silo-based nuclear forces—is that the theory likely does generally apply to the behavior of current nuclear powers. However, Green agrees on the need for more direct research on the applications of his argument to other countries if the evidence is accessible.

Regarding the evidence in his own account, Green contends that Glaser holds the book's theory to a much more demanding standard of empirical evidence regarding the drivers of arm racing than that provided by scholars of the Nuclear Revolution. As Green emphasizes, even though the Nuclear Revolution makes strong claims about the military industrial complex driving the Cold War arms race, there has been relatively little theoretical development or empirical demonstration of this idea; it is mostly an assumption that has not received systematic attention, especially in recent years as archival material has become available. In examining thousands of declassified documents, Green found relatively little evidence of military influence in quashing arms control and advancing counterforce. Rather, he notes that the documents across three administrations repeatedly point to the role of civilian political leaders in such decisions. Thus, Green argues that on balance there is dramatically more evidence for the domestic political mechanisms in Delicate Nuclear Balance Theory than for the Nuclear Revolution.

Overall, *The Revolution that Failed* comes across as an important and provocative book, not only for scholars of nuclear deterrence, but also for anyone whose understanding of international relations theory has been influenced by the strong assumptions of defense dominance embedded in the Nuclear Revolution theory. The book also offers a critical framework for understanding the emerging nuclear rivalries of today's security environment, while paving the way for productive further debate about how much nuclear weapons really have or have not changed world politics and for empirical research that will help us understand the issue across time and space.

Participants:

Brendan Rittenhouse Green is Associate Professor of Political Science at the University of Cincinnati. Dr. Green's research focuses on the dynamics of nuclear weapons and arms races during the Cold War and today. Besides the book reviewed in this roundtable, Green has published in *The Journal of Strategic Studies*, *Security Studies*, *International Security*, and other outlets for international affairs research and commentary. His article with Austin Long, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy" won the 2014 Amos Perlmutter Prize from the *Journal of Strategic Studies*. An additional article with Austin Long, "The MAD Who Wasn't There: Soviet Perceptions of U.S. Counterforce Capabilities in the Late Cold War," won the 2018 Outstanding Article in International History and Politics Award from the American Political Science Association.

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Fiona S. Cunningham is Assistant Professor of Political Science and International Affairs at the George Washington University and a Stanton Nuclear Security Fellow at the Carnegie Endowment for International Peace in 2020-1. Her research focuses on Chinese foreign policy, nuclear strategy, cyber security, and escalation dynamics in East Asia.

Charles L. Glaser is Professor of Political Science and International Affairs at George Washington University. He was the Founding Director of the Elliott School's Institute for Security and Conflict Studies from 2009-2019. His research focuses on international relations theory and international security policy, including U.S. policy toward China and nuclear weapons policy. Glaser holds a Ph.D. from the Kennedy School of Government at Harvard University, a B.S. in Physics from MIT, and an M.A. in Physics from Harvard. Previously, Glaser was the Emmett Dedmon Professor of Public Policy at the University of Chicago. His books include *Rational Theory of International Politics* (2010) and *Analyzing Strategic Nuclear Policy* (1990). In 2018 he was awarded the International Studies Association, Security Studies Section, Distinguished Scholar Award.

Vipin Narang is the Frank Stanton Professor of Nuclear Security and Political Science at the Massachusetts Institute of Technology. His research interests focus on nuclear proliferation and strategy. His second book, *Seeking the Bomb: Strategies of Nuclear Proliferation*, is forthcoming from Princeton University Press.

Marc Trachtenberg is a Research Professor of Political Science at the University of California, Los Angeles. He is the author of several books and many articles dealing mostly with twentieth century international politics. Those writings (with direct links to full-text versions, when available) are listed on his c.v.: <http://www.sscnet.ucla.edu/polisci/faculty/trachtenberg/cv/cv.html>. He is also the author of *The Craft of International History: A Guide to Method* (Princeton University Press, 2006), which was designed to help younger scholars learn how to do work in this area.

REVIEW BY FIONA S. CUNNINGHAM, GEORGE WASHINGTON UNIVERSITY

The Revolution that Failed examines an unresolved question for international relations scholars and practitioners: what is the effect of nuclear weapons on international politics? Brendan Rittenhouse Green's answer mounts a compelling challenge to a longstanding claim in the existing literature that nuclear weapons have revolutionized international relations. He argues that nuclear weapons have done little to alter the incentives for great powers to engage in peacetime competition to accumulate military power that characterized the pre-nuclear era. Green joins a number of scholars who have challenged the literature that established the "Theory of the Nuclear Revolution."⁴ His book stands out among them for its nuanced theoretical arguments and meticulous empirical analysis of U.S. Cold War decision-making about nuclear posture. *The Revolution that Failed* makes an enduring and important contribution to the international relations literature. Green's carefully scoped theoretical claims raise a research agenda's worth of additional questions, especially their generalizability beyond Cold War decision-making in the United States. This book will also help readers to understand U.S. nuclear policy today, as decision-makers once again look to pair arms control and competition in nuclear relationships with Russia and China.

The Revolution that Failed begins with a critique of the Theory of the Nuclear Revolution (TNR), that focuses on its key assumption about the robustness of mutually assured destruction (MAD). At its core, TNR argues that the defense-dominant nature of nuclear weapons made additional weapons superfluous once two states could absorb the other's attempt at a disarming first strike. In addition, the defense-dominant nature of nuclear weapons favored the defender, which made the status quo more stable. Arms build-ups, crises, and conflicts should not occur, according to what Green calls "Pure MAD" (10-15). Green is not the first scholar to point out the "obvious problem with MAD: the Cold War superpowers don't appear to have believed it" (2) given their energetic Cold War nuclear arms race. But his critique insightfully zeroes in on the theory's two core assumptions about the clarity of the status quo, and the robustness of MAD (21-26). If the status quo is ambiguous, MAD must be very robust for TNR's arguments that nuclear weapons entrench the status quo to hold (23). As more evidence of U.S. counterforce capabilities during the Cold War has become available to scholars, however, Green argues that MAD was much more delicate than TNR assumed and was viewed as such by U.S. decision-makers (chapter 2).

As an alternative to TNR, *The Revolution that Failed* offers a theory to explain the nature and intensity of peacetime nuclear arms racing once states achieve MAD. The engine of peacetime nuclear competition, according to Green, is the delicacy of MAD. Given the potential for technological change, states must continue to build more or better nuclear weapons (or both) just to retain their second-strike capability (42-44). In addition, states might also be tempted to try to escape MAD, if certain benefits appear within reach, ranging from diverting the resources of an enemy, forcing it to make peacetime accommodations, crisis and intra-war bargaining advantages, and more credible extended deterrence (50-52). The decision to adopt a competitive nuclear posture is not a simple one, however. When deciding whether and how to compete, leaders must assess their state's "constitutional fitness," which is defined as its domestic political capabilities and constraints for responding to external pressures (55). A state's constitutional fitness determines its competitive advantages in arms racing

⁴ Keir A. Lieber, "Grasping the Technological Peace: The Offense-Defense Balance and International Security," *International Security* 25:1 (2000): 71-104; Lieber and Daryl G. Press, "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security* 30:4 (2006): 7-34; Lieber and Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security* 41:4 (Spring 2017): 9-49; Lieber and Press, *The Myth of the Nuclear Revolution: Power Politics in the Atomic Age* (Ithaca: Cornell University Press, 2020); Brendan Rittenhouse Green and Austin Long, "Stalking Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies* 38:1-2 (2014): 38-73; Matthew Kroenig, "Nuclear Superiority and the Balance of Resolve: Explaining Nuclear Crisis Outcomes," *International Organization* 67 (Winter 2013): 141-171; Francis J. Gavin, "Strategies of Inhibition: U.S. Grand Strategy, the Nuclear Revolution, and Nonproliferation," *International Security* 40:1 (Summer 2015): 9-46.

and negotiations, and hence the nature of its nuclear weapons purchases, war plans, and arms control proposals (68). If the delicate nuclear balance is the engine of nuclear competition, a state's constitutional fitness is its breaks.

The Revolution that Failed tests the theory of nuclear competition with rich empirical analysis of U.S. decision-making about nuclear posture between 1969 and 1979. Green shows that U.S. decision-makers used arms control to channel the Cold War nuclear arms race into qualitative competition and away from quantitative competition. That competitive nuclear posture played to U.S. advantages in technological development and application, while avoiding its weaknesses in resource extraction and negotiating arms control under Congressional constraints. Green's systematic process-tracing of U.S. decision-making displays a mastery of the complexities of nuclear weapons and delivery systems, nuclear exchange calculations in future conflict scenarios, and the military and Congressional haggling over military platforms and diplomatic negotiations. The narrative is at once rigorous and entertaining, which enables the reader to evaluate and enjoy the evidence supporting the argument from Green's extensive archival work.

The empirical chapters of the book rely on an exhaustive and theoretically-informed review of U.S. archival documents, both published and unpublished. From the 20,000 odd pages of archival documents that Green reviewed for the book, he presents only the most probative evidence for both his theory and TNR, capturing the perceptions of capabilities, resources and intentions that informed key U.S. arms control and acquisition decisions. Green's use of sources clearly demonstrates the value of combining international relations theory with diplomatic historical analysis to produce novel insights that inform scholarly debates. In Green's case, those insights also resonate and sometimes even rhyme with contemporary policy debates. One memorable example is Secretary of Defense James Schlesinger's comment to British defense minister Roy Mason that "an attractive aspect of cruise missiles is that they *increase* the problems of verification" (180, emphasis added), which mirrors present U.S. government concerns about Chinese dual-use missiles.

Overall, Green convincingly and meticulously challenges the claim that "MAD is a fact, not a policy" to show that in peacetime, maintaining MAD is a policy choice based on a delicate fact. But his analysis also generates a number of questions about the extent to which the TNR has really failed, and how rational and consistent U.S. decision-makers' reasons for flouting of the theory's prescriptions really were. Green is admirably modest about his findings given the empirical rarity of MAD among nuclear powers and the availability of data of sufficient granularity to test his hypotheses (80-83, 252). Many of the questions his analysis raises are deserving of book-length treatment in their own right. I highlight just three of them to illustrate how *The Revolution that Failed* might energize the research agenda of nuclear scholarship.

First, the disconnect between peacetime nuclear competition and the absence of war or crisis bargaining under MAD remains both theoretically and empirically unresolved in the book. Green acknowledges his analysis does not challenge TNR's claim that advantages in the balance of nuclear capabilities will not affect the outcome of crisis or conflict bargaining (251). But the benefits of peacetime competition that Green outlines—deterring the outbreak of crises, resource inefficiency, political accommodations in peacetime, and alliance cohesion (50-52)—all depend on the premise that a bigger, more sophisticated arsenal affects an adversary's calculations in a crisis or conflict even if MAD remains. Green draws on earlier work to argue that "successful arms racing increases uncertainty about the state of the nuclear balance, even if it does not (yet) provide a military advantage" (50). But there is little evidence of such reasoning among the U.S. leaders whose decisions to pursue peacetime competition are carefully documented in the empirical chapters.

Indeed, *The Revolution that Failed* does not explain how U.S. leaders expected to generate coercive leverage in a crisis from a nuclear arsenal that was larger and more sophisticated than the Soviet arsenal, but still unable to reduce the damage the Soviet arsenal could cause to an acceptable level. The inattention of U.S. leaders to this question casts doubt on how rational their assessments of the costs and benefits of peacetime nuclear competition really were. Kissinger argued that hard-target capabilities would increase the credibility of U.S. nuclear threats (102) and give the United States a first-strike advantage (136). He argued that limited nuclear options that manipulate risk would give the Soviets "excuses not to escalate" (172). Harold Brown made similar arguments about limited nuclear options during the Carter administration (220). Brzezinski commented that limited nuclear options would enable the United States to fight a war that was "controlled for political purposes" (227). But did those decision-makers believe that a first-strike advantage would force the

Soviets to back down if they could still hold a handful of U.S. cities at risk? Did they intend for limited nuclear options to manipulate risk or enable the United States to fight a controlled, limited nuclear war? Green's careful historical analysis suggests that the book lacks a discussion of how U.S. leaders answered these questions because their reasoning is absent from the historical record.

The apparent disconnect between peacetime nuclear competition and the lack of compelling nuclear threats or use in MAD is an unsolved puzzle in the nuclear literature. The lack of a serious and consistent theory of how a partial escape from MAD would generate crisis leverage expressed by U.S. leaders suggests that Green's argument about adversary uncertainty does not explain this disconnect. This disconnect is also a puzzle for TNR. China is the only state that has reflected the difficulties of using nuclear weapons for coercive leverage against a nuclear-armed adversary in its small and retaliatory-only nuclear force posture. Nuclear scholars should devote more attention to explaining the disconnect between the peacetime benefits of nuclear competition, and the crisis or wartime applications of nuclear weapons.

Second, the relationship between the stakes of political disputes and peacetime nuclear competition is not thoroughly explored in the book. The stakes of the dispute might, however, be an unstated scope condition of the Green's theoretical argument. The reasons why the United States and Soviet Union would fight a war, and why those stakes were worth the extraordinary financial cost and risk of a competitive U.S. nuclear posture, are somewhat absent from much of the empirical discussion. Of course, few would argue with Green's assumption that the stakes of the political disputes between two nuclear superpowers during the Cold War were constant and high. The importance of Western Europe's survival to Washington and the maintenance of the Warsaw Pact to Moscow are uncontroversial.

The stakes of the political dispute between two nuclear rivals might affect the cross-national generalizability of the theory. Green makes the astute observation in the conclusion that "we ought to expect that the farther away a political phenomenon is from the decision to detonate a nuclear weapon, the less powerful the pacifying effect of the nuclear revolution" (252). Some political disputes might, however, never warrant a decision to detonate a nuclear weapon. In those cases, could *both* TNR and Green's theory nuclear competition cease to be relevant? Put differently, if politically salient disputes over the status quo fall below a certain threshold of importance, would states still engage in nuclear competition under MAD? In his conclusion, Green states that the U.S.-Russia, U.S.-China, and India-Pakistan dyads meet the standard of having a politically salient dispute over the status quo (253, fn. 8). But the relevance of peacetime nuclear competition to salient but lower-stakes disputes among nuclear powers, such as China's maritime territorial disputes with U.S. allies in Asia, Ukraine, or the China-India border dispute, is an important question for future research.

Third, more research is needed before international relations scholars are justified in declaring that the nuclear revolution has failed (or, more accurately, the theory of the nuclear revolution has been falsified). Green convincingly demonstrates that the theory of the nuclear revolution fails to explain an important aspect of the nuclear behavior of an important state: peacetime nuclear posture choices in the United States. But Green's findings could also be interpreted as showing that the United States is the exception to TNR's expectations about arms competition. Green's book provides researchers with a solid theoretical foundation and template for a research design with which to further test competing hypotheses about peacetime nuclear competition. Some modifications may, however, be necessary to determine the external validity of Green's argument and the limits of TNR. I briefly outline them below.

The first issue scholars will need to consider is whether MAD is too high a threshold for exploring the implications of mutual nuclear vulnerability on peacetime nuclear competition beyond the U.S.-Russia/Soviet dyad. For example, a book testing TNR on Chinese nuclear strategy would probably be entitled *The Revolution that Succeeded*. China's nuclear posture has hewed closely to the expectations of TNR: it has a small arsenal, retaliatory employment policy, and little need for arms control given the strong incentives for unilateral restraint (69-71). Evidence of the views of generations of Chinese leaders indicate that they either do not recognize the benefits of nuclear competition or do not assign much value to them.⁵ Nor

⁵ M. Taylor Fravel, *Active Defense: China's Military Strategy Since 1949* (Princeton, N.J., 2019), chap. 8; Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Posture," *International Security*

have they reacted to the larger and more sophisticated arsenals of the United States and Soviets as if matching those arsenals were necessary to deny their adversaries those benefits.⁶ China seems to be an important case for hypotheses about peacetime nuclear competition. But it has never met the scope conditions of Green's theory (253, fn. 5) or TNR.⁷ China might have recently achieved mutual vulnerability with the United States,⁸ but it has certainly not achieved the standard of mutually assured destruction set by the Cold War. By setting the threshold of nuclear stalemate at assured destruction, Green might be excessively restricting cross-national applications of his theory.

A second issue that scholars will need to consider is how to disentangle the delicacy of the nuclear balance for technological versus political reasons in asymmetric nuclear dyads. Relatedly, if there are discrepancies in two countries' views of how much is enough to deter, as is the case in all of China's nuclear relationships, will those discrepancies endure over time? Examining Soviet views would be a useful starting point for answering this second question. Scholars could examine whether the United States happened to find a like-minded adversary in the Soviet Union that shared its views of the benefits of peacetime nuclear competition, or whether the two countries' views converged over the course of their repeated interactions during the Cold War.

A third issue that scholars will need to consider is whether to treat evidence of fears of the delicate nuclear balance and the pursuit of the benefits of peacetime nuclear competition as equally problematic for TNR. Among states pursuing peacetime nuclear competition, the United States might be unique in pursuing its peacetime benefits. As Green suggests in his conclusion, the United States may be the exception rather than the rule because of its grand strategic preferences: "the logic of primacy makes it very difficult for Washington to let its nuclear superiority to erode" (264). If other states choose to pursue nuclear competition for fear of losing their secure second-strike to the United States, U.S. grand strategy may be driving peacetime nuclear competition throughout the international system.

Nuclear weapons might have failed to revolutionize international politics because of the U.S. refusal to accept the vulnerability that comes with MAD. Those U.S. nuclear posture choices affect the nuclear postures of its rivals Russia, China, and North Korea. Those states could act according to the dictates of the security dilemma and build up a nuclear arsenal to deny the benefits of peacetime competition to the United States, following the Soviet example. Or they could act as if peacetime nuclear competition gives the United States no benefits and retain a nuclear arsenal that does not meet the threshold of MAD, as China appears to be doing. If a country follows China's lead, it is likely to be scoped out of cross-national tests of TNR. If further research shows that U.S. adversaries engage in peacetime nuclear competition because of the delicate nuclear balance mechanism but not to pursue the peacetime benefits of nuclear competition, their competitive behavior might be less problematic for TNR. India's nuclear force posture might help to test this alternative hypothesis of

35:2 (Fall 2010): 48–87; Wu Riqiang, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies* 36:4 (2013): 579–614.

⁶ Fiona S. Cunningham and Fravel, "Assuring Assured Retaliation: China's Nuclear Strategy and U.S.-China Strategic Stability," *International Security* 40:2 (Fall 2015): 7–50.

⁷ Proponents of TNR have described the threshold states must meet to reap the pacifying benefits of nuclear weapons as a "mutual second strike capability, where neither side can launch a first strike that is successful enough to prevent retaliation from the other." Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca: Cornell University Press, 1989), 5.

⁸ Thomas J. Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and US-China Security Relations," *Journal of Strategic Studies* 35:4 (2012): 447–487; Wu, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics."

the ripple effects of U.S. primacy, as the only country that might to pursue a competitive counterforce nuclear posture that is not a U.S. adversary.⁹

In conclusion, it might be too early to tell whether the nuclear revolution has failed. But Brendan Rittenhouse Green's *The Revolution that Failed* challenges researchers to build on his sophisticated and compelling study of the Cold War arms race to provide a comprehensive mid-term report card for the theory of the nuclear revolution. In the meantime, Green's readers will not be surprised by current U.S. efforts to pursue peacetime nuclear competition and arms racing simultaneously with both Russia and China. Beijing's and Moscow's reactions will once again put the theory of the nuclear revolution to the test.

⁹ Christopher Clary and Vipin Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities," *International Security* 43:3 (Winter 2018/2019): 7-52.

REVIEW BY CHARLES L. GLASER, GEORGE WASHINGTON UNIVERSITY

Still Powerful, Nuclear Revolution Theory May Require Qualifications

Brendan Green has written an excellent book that deserves the full engagement of scholars who focus on nuclear weapons, as well as those who are interested more broadly in international relations theory. In *The Revolution that Failed*, he develops a sophisticated argument that attempts to explain the Cold War nuclear arms race between the United States and the Soviet Union, and more narrowly their failure to significantly curb the competition via arms control. Green's analysis takes aim at two bodies of theory. The first is the well-established dominant lens for understanding the impact of nuclear weapons on superpower behavior—the Theory of the Nuclear Revolution (TNR)—which Green labels “Pure MAD.” It predicts different nuclear forces and much less intense nuclear competition than occurred between the United States and the Soviet Union during the Cold War. The second, which he terms “Parochial MAD,” is a less well-established set of arguments that explain the nuclear competition that actually occurred by emphasizing the role of domestic interests, especially the preferences of military organizations, in distorting U.S. nuclear policy.

To replace Pure MAD, Green develops “Delicate Nuclear Balance Theory” (DNBT). Very briefly and somewhat oversimplifying, according to Delicate Nuclear Balance Theory a superpower might be able to undermine its adversary's assured destruction capability or at least create meaningful uncertainty about it. This is a clever move—a state does not have to confidently undermine its adversary's assured destruction capability, let alone be able prevent itself from suffering an extremely high level nuclear damage; instead, creating uncertainty in the adversary about its assured destruction capability is sufficient, which is a less demanding achievement. Given this criterion, Green argues that contrary to Pure MAD, the nuclear balance may be delicate—“small technical changes can produce dramatic uncertainties about war outcomes” (42). Consequently, “states must prepare for the possibility that stalemate could erode. They must continue to invest in their nuclear forces, and they must certainly respond to their adversary's nuclear buildups” (43). According to DNBT, a state can therefore use peacetime competition to undermine its adversary's confidence in its ability to retaliate massively. This uncertainty provides the state with a nuclear advantage, which can in turn provide a variety of benefits, including contributing to deterrence of crises and forcing the adversary to divert resources into the types of arms that it produces at a disadvantage. Thus, contrary to Pure MAD, a state could find intense peacetime nuclear competition preferable to cooperation.

Green also identifies a second dimension of Delicate Nuclear Balance Theory: U.S. leaders were uncertain about how the Soviet Union viewed MAD, including the possibility that Soviet leaders rejected it and believed instead that nuclear warfighting could be effective and nuclear wars could be won, at least in relative terms. Given these uncertainties, the United States needed to deter the Soviet Union on its own terms, which required competition in counterforce systems, among other deviations from Pure MAD. This logic was prominent in the Cold War debate and has been fully dealt with by proponents of the Theory of the Nuclear Revolution.¹⁰ Therefore, I focus this essay entirely on Green's arguments that hinge on actually escaping certainty of being in MAD.

In place of Parochial MAD, Green develops a theory of “comparative constitutional fitness” to explain a state's choice between nuclear competition and arms control, and its choice of specific policies within these alternative approaches. Unlike Parochial MAD, which understands the Cold War competition as suboptimal/irrational, comparative constitutional fitness explains it as rational. States can have different relative advantages in competition, which reflect their overall wealth, their ability to extract resources for military purposes, and their ability to translate these resources into high technology forces. States also differ in the ability to effectively engage in arms control, which depends on their ability to bargain effectively and to monitor agreements. Green employs these arguments to explain the divergent U.S. and Soviet nuclear arming preferences with, for example, the United States preferring to deploy technologically advanced forces and the Soviet

¹⁰ Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca: Cornell University Press, 1984) and Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton: Princeton University Press, 1990).

Union preferring larger numbers of less advanced forces. He concludes that, in combination with Delicate Nuclear Balance Theory, these theories explain the U.S. decisions to compete intensively in counterforce weapons and not to limit them via arms control.

Green's book is impressive: he provides a nuanced description of the TNR that is careful not to strawman MAD to his advantage; he builds a multi-layered argument that provides a full explanation for the Cold War nuclear competition; and he draws extensively on primary documents to evaluate his theories. Although I disagree with some of his arguments, *The Revolution that Failed* succeeds in significantly advancing the nuclear debate.

Green's first major task is to demonstrate that the Cold War nuclear balance was in fact delicate. He interprets pure MAD to hold that states "can afford to ignore their opponent's buildup" (31). This is one of the few places where Green overstates a feature of Pure MAD. The Pure MAD argument does hold that both countries should appreciate that their adversary can maintain its assured destruction capability and therefore should largely forego challenging it. If, however, the adversary does nevertheless build counterforce/counter-retaliatory systems (including anti-submarine and national missile defense systems) or if technology simply evolves in ways that increase threats to retaliatory systems, then Pure MAD holds that the state may need to respond and should respond vigorously if its overall retaliatory capabilities are in jeopardy.

Most adherents to Pure MAD appreciated the possibility of both improvements in counterforce systems and technological breakthroughs; they were certainly aware of Soviet efforts to threaten U.S. forces, especially its intercontinental ballistic missiles (ICBMs). Consequently, they concluded that the United States should not rely on a single type of strategic delivery system (or a single means of penetrating Soviet defenses), preferring instead that the United States rely on a triad or at least a dyad of nuclear forces. Each leg of the U.S. force provided a hedge against the possible defeat or failure of another leg and the time to respond. And efforts to preserve the effectiveness of these legs were often warranted, for example, deploying air-launched cruise missiles on strategic bombers to insure the penetrability of this leg. More specifically, for example, in the early 1980s, Albert Carnesale and I concluded that although ICBM vulnerability did not then warrant U.S. deployment of a new basing mode, "the time may come when corrective treatment is called for" and that to prepare for this contingency, the United States should pursue a range of programs, including systems required to provide a credible launch-under-attack option and further evaluation of alternative basing modes.¹¹ In short, although Pure MAD is optimistic about superpowers' abilities to preserve their assured destruction capabilities, it is also consistent with vigilant efforts to preserve this capability if the adversary poses a current or future threat.

This point aside, Green is on solid ground if he can demonstrate that the United States or the Soviet Union, facing the other's counter-retaliatory programs, was unable to maintain confidence in its assured destruction capability. To do this, he explores each leg of the states' nuclear forces and their nuclear C3. Green finds that the U.S. ballistic missile submarines (SSBNs) were highly survivable and did not face known future threats, but its ICBM and bomber legs, and its command, control and communications (C3) systems, suffered significant vulnerabilities. Green concludes that the U.S. retaliatory capability was delicate, as reflected in this summary of his analysis: "The nuclear balance was more delicate than Pure MAD admits: the survivability of weapons systems varied over time, by type, and across the superpowers" (29). All of these U.S. vulnerabilities, however, were known during the Cold War and C3 was recognized as potentially the most critical and challenging among them. Nevertheless, proponents of Pure MAD concluded that the U.S. retaliatory capability was robust. The United States developed ways to ensure its ability to launch a massive retaliatory attack under even the conditions most challenging for C3 and could have still higher confidence in more realistic scenarios.¹² In addition, while the ICBM and bomber legs did suffer vulnerabilities, their joint vulnerability was greatly reduced because an optimal attack against one leg

¹¹ Albert Carnesale and Charles Glaser, "ICBM Vulnerability: The Cures are Worse than the Disease," *International Security* 7:1 (Summer 1982): 70-85, quote at 84.

¹² Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket, eds., *Managing Nuclear Operations* (Washington, D.C.: Brookings, 1987), especially Ashton B. Carter, "Assessing Command System Vulnerability."

would provide warning valuable for launching the other leg, a point that Green fails to note. In short, Green's review finds delicacy where it did not exist. Although confidence in the United States' assured destruction capability did require responding to Soviet counterforce, the United States was able to maintain the robustness of and confidence in its retaliatory capability.

In contrast, Green's review shows that the standard Cold War understanding of Soviet retaliatory capabilities was incorrect: Soviet SSBNs were more vulnerable for much of the period than was then known in the unclassified literature.¹³ The potential significance of this vulnerability was reinforced by the foreseeable increasing vulnerability of fixed Soviet ICBMs; by the early 1970s they were expected to be highly vulnerable by the mid-to-late 1980s.¹⁴ The Soviet Union appears to have retained its assured destruction capability, because the period of greatest SSBN vulnerability occurred while its ICBMs were highly survivable. Importantly, Green finds that MAD persisted through the Cold War (44). In addition, the Soviet Union modernized its SSBN force and altered its operational procedures, which increased their survivability. The Soviet Union also responded to the growing vulnerability of its silo-based ICBMs by deploying mobile missiles as the Cold War came to an end. This may not have been an adequate future solution, however, both because the mobiles were not deployed in adequate numbers to meet future Soviet retaliatory requirements and the Soviet Union engaged in operational practices that increased the U.S. ability to locate them. In short, Green presents a solid case that there could have been periods during which some Soviet uncertainty about the USSR's *future* assured destruction capability was likely warranted. Given the importance of this finding, how much the actual vulnerability of the overall Soviet retaliatory capability varied across time, as well as Soviet estimates and understandings of this vulnerability, deserve further study.

Based on this account, the U.S. ability to create this degree of Soviet uncertainty is inconsistent with the TNR, which holds that a superpower that responds to its adversary's counter-retaliatory programs should succeed in maintaining confidence in its current and future assured destruction capability. I have to admit that I acknowledge this inconsistency somewhat reluctantly, as I had a hand in elaborating the TNR. At that time, the knowledge that supported the empirical claim—which was primarily military-technical in nature—that a superpower would be able to maintain high confidence in its ability to preserve its current and future assured destruction capability appeared quite strong. Even then, as I noted above, analysts who accepted the basics of the TNR believed the United States should preserve diversity in its retaliatory capabilities, even when the survivability of its SSBNs was believed to be extremely high and long lasting, which has turned out to be correct. But, while recognizing the growing U.S. ability to destroy Soviet ICBMs, these analysts did not seriously question the Soviet Union's ability to preserve its assured destruction capability.

Given the possibility that a superpower could escape MAD, the Theory of the Nuclear Revolution will need to be reconsidered and will likely require some revisions or at least qualifications. Its claim about the robustness of MAD underpins the theory's internal logic. The extent of these qualifications, however, will be conditional on the extent of uncertainty or actual damage limitation capability that the state or states can achieve. Here I offer a couple of initial observations that suggest Green's argument exaggerates the benefits of simply creating adversary uncertainty about its assured destruction capability—for example, on the scale that was created by the United States during the Cold War—and, therefore, exaggerates the extent that the basics of Pure MAD will need to be revised.

¹³ For path breaking research on this question, see Owen R. Cote, Jr., *The Third Battle: Innovation in the U.S. Navy's Silent Cold War Struggle with Soviet Submarines*, Naval War College Papers 16 (Newport: Naval War College Press, 2003). See also Austin Long and Brendan Rittenhouse Green, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies* 38:1-2 (2015): 47-51.

¹⁴ For a more extensive exploration of Soviet concerns about U.S. counter-retaliatory programs, see Brendan R. Green and Austin Long, "The MAD Who Wasn't There: Soviet Reactions to the Late Cold War Nuclear Balance," *Security Studies* 26:4 (2017): 606-641.

First, Green makes a general claim that when MAD is delicate, peacetime competition could bolster general deterrence. The extent of the escape, however, obviously matters—the spectrum ranges from having acquired the ability to fully prevent the adversary’s retaliation to having some low probability of acquiring a modest damage-limitation capability in the future.¹⁵ Significant deterrence benefits would accrue to only a small slice of outcomes along the competitive spectrum. Future uncertainty would have no impact on an adversary’s current decisions about whether to launch a crisis. Even certainty that the United States had escaped MAD by gaining a modest damage-limitation capability would be of little general deterrence value. The United States would remain so vulnerable to retaliatory damage, damage that truly dwarfed the stakes involved, that while it might gain a small bargaining advantage, deterrence would hinge much more heavily on the balance of resolve and the quality of U.S. conventional deterrent capabilities.¹⁶

Second, the possibility of a limited or future escape from MAD does not mean that a state should pursue it. Green is cagey on this point. On the one hand, he holds that the “Delicate Nuclear Balance mechanism gives an alternative account of how rational statesmen will assess the nuclear balance” (67), and that “the Cold War nuclear competition was a rational response to uncertainty about nuclear stalemate” (260-261). On the other hand, he concludes that “many alternative choices were possible, or even superior” (261). I agree with his overall conclusion that “Once Pure MAD’s beliefs are abandoned, the policy trade-offs become complex, and subject to estimates of uncertainty about which reasonable people can disagree” (261). But, when escape is both uncertain and likely quite limited, I anticipate that less competitive policies that are designed not to challenge an adversary superpower’s assured destruction capability will usually remain a country’s best option.

Green’s second major task is to employ his theory of constitutional fitness to explain U.S. arms control policy. I agree with his contention that what he terms Parochial MAD has not been fully developed or tested, and, more generally, that we need a fuller explanation for the Cold War nuclear competition. However, Green’s analysis, built on the combination of DNBT and U.S. constitutional fitness, fails to provide a compelling and satisfying explanation. Green draws extensively on primary documents and carefully traces the discussions of key players in the formulation of U.S. arms control policy. But while his recounting finds many examples of U.S. civilian leaders favoring policies to modernize U.S. counterforce weapons, they include strikingly few arguments that the United States should pursue these weapons in order to undermine the Soviet assured destruction capability.

U.S. policymakers repeatedly favored these systems because they could increase the United States’ ability to target Soviet forces or because the United States had a lead or permanent advantage in these advanced systems. But, especially during the Nixon and Ford administrations, they do not carefully connect these advantages to the ability to limit damage to the United States, which is necessary to indicate that the balance is delicate and to provide bargaining advantages. They do not rely, at least explicitly, on assessments of how many Soviet weapons (or how much equivalent megatonnage) would survive U.S. counterforce strikes in various realistic scenarios and best-case scenarios.¹⁷ In addition, they rarely anticipate or consider possible Soviet reactions that might offset advances in U.S. counterforce weapons that would take years or a decade to deploy. There is more discussion of actual damage-limitation potential during the Carter administration, but even these are part of a discourse that appears over-determined in favor of counterforce and does not emphasize damage limitation.

¹⁵ Even the most successful outcomes may not be as desirable as they initially appear; see Glaser, *Analyzing Strategic Nuclear Policy*, Chaps. Four and Five.

¹⁶ For a detailed application of this logic to U.S. deterrence of China, see Charles L. Glaser and Steve Fetter, “Should the United States Reject MAD?: Damage Limitation and U.S. Nuclear Strategy toward China,” *International Security* 41:1 (Summer 2016): 49-98, esp. 81-90.

¹⁷ There are some partial exceptions; for example, on page 132, Green refers to a 1972 NSC analysis that found the improving counterforce capability of the U.S. Minuteman force could result in only 35 surviving Soviet ICBMs; he does not say whether the study addressed the number of SLBM warheads that would survive.

In other words, the discussions that Green reports do not sound, at least to my Nuclear-Revolution biased ear, like the boundedly rational logic of Delicate Nuclear Balance Theory. In fact, the discourse is far less strategically sophisticated than we might reasonably hope. And it is marred by incoherence. For example, after detailing sustained U.S. interest in and pursuit of counterforce systems, Green recounts that U.S. policymakers painted a worrisome view of the Soviet Union based on its pursuit of counterforce weapons, its apparent rejection of stalemate, and its rejection of American theories of nuclear stability (161-163). Yet much of this critique applied equally well to the United States; in fact, it applied better because the United States was leading in the counterforce competition and was not guided by its own theories of stability.

U.S. leaders did sometimes voice concern about U.S. retaliatory capabilities, especially the likely growing vulnerability of its ICBMs and of its bomber leg. But they do not give priority to options that would preserve the survivability of the United States' ICBMs, most importantly banning MIRV and then later limiting the number and accuracy of MIRVed warheads. Henry Kissinger, who was then the National Security Advisor, even raised the possibility of reducing the size of the bomber force because it could not promptly destroy Soviet targets. (99) A few years later, the top policymakers in the Nixon and Ford administrations maintained that ICBM vulnerability was not a serious problem. (135). In short, U.S. leaders sometimes worried about specific force vulnerabilities, but there was little-to-no serious concern about the United States' assured destruction capability. This lack of concern about U.S. retaliatory capabilities need not be a big problem for Green, since showing that U.S. policymakers believed the United States enjoyed the advantage in the competition to achieve damage-limitation capabilities would be sufficient to support DNBT. But the evidence prevents Green from unearthing this essential finding.

Green is more successful in demonstrating that U.S. counterforce programs were not driven primarily by organizational interests, that is, Parochial MAD is at best incomplete. In contrast to the emphasis of Parochial MAD, there was wide support among top U.S. civilian policymakers for pursuing counterforce. Green does, however, underestimate the impact of military interests and influence on U.S. arms control policy. He emphasizes that the Air Force saw more at stake in bombers than ICBMs. While correct, once the Air Force was responsible for the United States' ICBMs, it was deeply committed to enhancing their counterforce capability. A key example is its rejection of MIRV until its potential accuracy was known to be sufficient to destroy hard targets, even though MIRV would have increased the ability of ICBM warheads to efficiently penetrate Soviet missile defenses.¹⁸

At least as important in terms of arms control is the influence that the military could exercise via Congress. Green describes Congress as primarily opposed to counterforce during the Nixon and Ford years. However, Congress also influenced the shape of arms control policy because Senate ratification of treaties was required. And this provided the military with significant influence because policymakers believed that the approval/support of the Joint Chiefs of Staff was likely required for ratification.¹⁹ Gerard Smith, who was the lead U.S. negotiator in SALT I, recounts that “in both capitals political authorities would have to take and sustain extremely difficult positions vis-à-vis their military if MIRV were to be controlled, positions that could undermine crucial military support for the entire SALT effort. This common military interest in letting MIRV run free went a long way to spoil chances for a MIRV ban.”²⁰ Kissinger is reported to have decided early during the evaluation of SALT options to seek limits on ABM but not MIRV based “not on analytical grounds, but on

¹⁸ Ted Greenwood, *Making the MIRV: A Study of Defense Decision Making* (Cambridge: Ballinger, 1975).

¹⁹ Steven E. Miller, “Politics over Promise: Domestic Impediments to Arms Control,” *International Security* 8:4 (Spring 1984): 67-90, esp. 80-81.

²⁰ Gerard Smith, *Doubletalk: The Story of SALT I* (Garden City: Doubleday, 1980), 157.

political grounds of ‘what the traffic would bear’ and the Pentagon’s strong stand against MIRV.”²¹ In short, Green’s argument that the military was not a significant factor in guiding the United States away from seriously pursuing arms-control limits on U.S. counterforce is unconvincing.

Green nevertheless significantly advances our understanding of the U.S.-Soviet arms race by making clear that an explanation that focuses primarily on the military’s support for counterforce—military-driven Parochial MAD—is incomplete. He leaves no doubt that civilian policymakers within the Executive branch were rather consistently (although not always) strong and influential supporters of improving in U.S. counterforce programs. The largely unwavering civilian support for counterforce remains a puzzle. A deeper understanding of top civilian leaders, and how they interacted with the military (and possibly other actors) to produce the Cold War nuclear arms race requires further research.

²¹ Raymond L. Garthoff, *Détente and Cooperation: American-Soviet Relations from Nixon to Reagan* (Washington, D.C.: Brookings, 1985), 135, fn 20. Smith, *Doubletalk*, suggests that Nixon may have made a similar political calculation (119) and reports that Kissinger told him that he favored a MIRV ban, if verifiable (p. 169).

 REVIEW BY VIPIN NARANG, THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

This is the best book on late Cold War American nuclear strategy in thirty years. In 1990, a trio of books on American nuclear strategy—Robert Jervis’s *The Meaning of the Nuclear Revolution*, Charles Glaser’s *Analyzing Strategic Nuclear Policy*, and Scott Sagan’s *Moving Targets*—assaulted American folly and deviation from the only “rational” and stabilizing nuclear strategy under a condition of Mutually Assured Destruction (MAD) with the Soviet Union: a minimal, survivable, assured retaliatory nuclear arsenal.²² Together they represent a coherent view on the role of nuclear weapons in international politics, the so-called “theory of the nuclear revolution” (TNR). These books, and TNR in particular, have remained the canon of the field for decades. They now have company.

Green’s book is a devastating strike on the logic and empirics of TNR, showing that the purported illogic of American nuclear strategy—with heavy doses of counterforce and damage limitation, and an unrelenting pursuit of Soviet nuclear and submarine forces—was perhaps not so illogical after all. Instead, it was driven by a belief that nuclear stalemate was delicate and potentially ephemeral, and needed constant attention, and that the United States was differentially fit for very particular types of competition—qualitative, not quantitative—that led to a consistent and clear-eyed nuclear force posture *and* arms control approach that sought to exploit America’s technological advantages while seeking to limit the Soviet Union’s quantitative advantages. It did this not because of domestic political perversions but because successive late Cold War administrations—Republican and Democrat alike—believed it bought the United States advantages in peacetime, crises, and with allies. Green’s book is a masterclass in theoretical dissection, careful historical work, and ambition. It overturns a central pillar of international relations scholarship—that Cold War American nuclear strategy was insane. It should be read and assigned alongside Jervis, Glaser, and Sagan by every scholar and student in the field.

Green’s dissection of the logic of MAD and TNR is worth the price of admission alone (currently a bargain at \$40). The core logic of TNR, or Pure MAD, as Green explains in a crystal-clear exposition, is that two nuclear states possessing mutually accepted second-strike capabilities are in a condition of inescapable MAD in which strategic nuclear use would be suicidal. If true, this has several implications. First, it means that a nuclear war is unwinnable, and it is futile and foolish to try to develop capabilities to try to win one—doing so will only frivolously waste money on arms racing to no end, and with no benefit. Second, it means that the nuclear competition should be relaxed or nonexistent and that a state’s nuclear employment should center on counter-value targeting, since meaningful damage limitation—through a combination of counterforce and defenses—is impossible. Knowing that military victory is impossible, the two states should, in theory, cease pursuing highly competitive military policies and strategies. This all rests on several assumptions. First, it assumes that survivability is cheaper and easier to obtain and maintain than it is to threaten. Once a condition of mutual second-strike capabilities is acquired by both states, it is assumed that it is impossible to escape, and therefore states should not even try. Second, it assumes that states are content with the constraining effects of MAD and do not seek political objectives that may require them to destabilize MAD.

Are these assumptions true? Green convincingly argues that they are not. Most importantly, in my view, he argues that Pure MAD takes much too static a view on the automaticity and permanence of survivability and stability. Jervis’s famous line that “MAD is a fact, not a policy” suggests that once a condition of MAD is obtained, it is essentially permanent.²³ But technological changes can disrupt the stability of the balance, and states may constantly fear the future erosion of MAD—one that may expose them to a window of first-strike vulnerability which can imperil their very survival. If one injects any temporal uncertainty into Pure MAD, the predictions can crumble very quickly as states, now having to be attentive to the future balance and to pursue excess survivability, are incentivized to continue to build up and build out. Rather than

²² Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca: Cornell University Press, 1989); Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton: Princeton University Press, 1990); Scott D. Sagan, *Moving Targets: Nuclear Strategy and National Security* (Princeton: Princeton University Press, 1990).

²³ Jervis, *Meaning of the Nuclear Revolution*, Chapter 3.

survivability automaticity, states operate in a world where they fear discontinuities and disruption to the survivability of their nuclear forces—what Wohlstetter referred to as the “delicate” rather than the automatic balance of terror.²⁴ What is survivable today may not be survivable tomorrow, which generates pressures to stay ahead of the survivability curve lest a technological advance by the adversary impart it a devastating first strike advantage. The implication of this simple injection of uncertainty is a much more highly competitive world than Pure MAD would predict. Second, states—and especially the United States—hate being constrained, and Pure MAD is highly constraining. The United States did not seek to avoid crises, it needed to win them. That is, the assumption that states will be conditioned to be status quo seeking under a condition of MAD is also dubious, with the prediction quickly flipping from a relaxed world with little nuclear competition to a highly competitive world. Instead of embracing MAD, the United States always sought to escape it.

To be sure, proponents of Pure MAD saw the same world Green did: a United States that went gangbusters on counterforce across all legs of the triad, damage limitation, and antisubmarine warfare. How did they explain the deviations from what they theorized the United States should do as opposed to what it actually did? Enter Parochial MAD, what Green describes as the effort to smuggle in domestic variables post hoc to explain the perversions in American nuclear strategy: namely, the military industrial complex that profited from a massive nuclear buildup and focus on high technology solutions to the vulnerability problem. There are other unit level explanations that have been variously deployed over the years, such as a uniquely American ideological aversion to the very notion of ‘vulnerability.’ The United States, with a tradition of buffers across the ocean, is allergic to the notion of being vulnerable to another nation, and persistently tried to escape vulnerability to the Soviet arsenal, so the theory goes. Whatever your preferred domestic political explanation for the perversion of American nuclear strategy, these explanations are unified by the idea that it was deviant behavior from the stabilizing world and incentives of MAD.

Green’s most important contribution is theorizing that, in fact, what we have long characterized as an irrational Cold War American nuclear strategy may have actually been perfectly rational. For one, the pressures of the Delicate Nuclear Balance argument—that survivability requires care and that there is a survivability/vulnerability curve which states have to stay way ahead of for fear of surprise technological advances that can have existential consequences—force leaders to be highly attentive to the vulnerabilities in their arsenals as well as those of their adversaries and overcorrect. Better to be safe than sorry.

Second, how states tried to maintain competitiveness in the nuclear realm depended on their *comparative constitutional fitness* relative to their adversary. The United States’ strengths were in technology and its ability to convert technological advantages to military power, giving it a comparative advantage in qualitative competition. The Soviet Union’s strength was a massive extractive capacity that gave it an advantage in quantitative competition. How did that manifest itself in the types of strategies the United States would pursue? It meant that the United States sought nuclear force acquisition policies that favored offsetting the Soviet Union’s quantitative advantage with qualitative advances—accuracy for hard kill, advances in antisubmarine warfare to hold Soviet nuclear-powered, ballistic missile-carrying submarines (SSBNs) at risk, intelligence, surveillance, and reconnaissance, and command and control. It *also* meant—and this is a crucial unifying feature of Green’s book that should not be overlooked—arms control policies that sought to *cap* how far in front the Soviet Union could get in terms of numbers. If one has a qualitative advantage, parity is your best friend. In concert—America’s sophisticated counterforce and damage limitation platforms *plus* SALT caps—are exactly what one would expect for a state with its comparative constitutional fitness. In this way, Green’s theory resolves a great tension in Cold War nuclear policy: why did the United States go crazy on counterforce, but also push for strategic arms limitation? It did so because it maximized its qualitative advantages while seeking to contain the Soviet advantage in out gunning the U.S. with numbers.

Third, the United States pursued this mix of highly competitive policies because successive administrations believed it *bought* the United States major advantages in peacetime, crises, and with allies. In peacetime, it put pressure on the Soviet Union to keep up and to divert resources to maintain survivability, bolstering general deterrence. In crises, it may have given

²⁴ Albert Wohlstetter, *The Delicate Balance of Terror* (Santa Monica: RAND Publications), 1958.

America bargaining advantages and allowed it to press its advantage. Third, leaders seem to have believed it strengthened alliance cohesion. In this way, the very specific—and in Green’s rendering, coherent—nuclear policies in the second half of the Cold War were deliberate and a feature, not a bug, of American nuclear strategy.

Green tests the theory on the Nixon, Ford, and Carter administrations policies and finds overwhelming—and to me, convincing—support for the two core parts of this theory, the Delicate Nuclear Balance and the Comparative Constitutional Fitness arguments. I won’t belabor the empirics except to say that are exceptionally researched with a wealth of primary documents, getting to the heart of leaders’ beliefs, fears, and rationales for American nuclear and arms control policies. They are a delight to read in their detail and prose. I was especially impressed with the chapter on the Carter Administration’s reversal from being proponents of Pure MAD in 1977 to counterforce cowboys only a year later. Indeed, this may be the best treatment of the Carter Administration’s nuclear policies I have seen. Presidents Richard Nixon and Gerald Ford are given (rightful) credit or blame for laying the groundwork for the highly competitive policies and capabilities during the Reagan years, but Green shows how significant the Carter Administration was in laying the technological foundation for “the new era of counterforce,”²⁵ with an emphasis on accuracy, ISR, and ASW. The chapter could have easily been titled, “there is no zealot like a convert.” The empirical chapters are gold—highly detailed, and highly convincing.

Like all good books, Green’s raises all sorts of interesting questions. I raise three here for future scholars to tackle. First, there is one explanation smuggled into Parochial MAD by realists of all stripes that is not unit-level: non-contiguous extended deterrence. Green incorporates this explanation into the alliance cohesion explanation, but it may be worth rigorously weighing how much the unique requirements of non-contiguous extended deterrence drove the United States to pursue huge doses of counterforce for strategic reasons—to reassure the allies that it could disarm the Soviet Union while immunizing the American homeland, making its defense commitments to them credible. Extended deterrence is the lone ‘structural’ rationale that Parochial MAD offers for the empirical record, one that is not a perversion due to domestic politics or bureaucratic interests. It may be worth assessing how the delicate nuclear balance and comparative constitutional fitness calculations were or were not driven by concerns about maintaining the credibility of non-contiguous extended deterrence.

Second, was—and is—the desire to escape MAD at the great power level a uniquely American experience? Was the Soviet Union reacting to, or was it a willing participant in, the Cold War excesses? There is tantalizing evidence that American policymakers believed it was the Soviet Union that was, at times, driving the competition. As Soviet archives become available and declassified, getting the mirror view of how Moscow viewed the constraining effects of MAD would be fascinating. And what about China? China was for many years the Pure MAD theorist’s dream, content with only a (plausibly) assured retaliation capability. Given that China should also have a comparative advantage in extraction, how do we explain why China has chosen a minimally effective strategic nuclear arsenal vis-à-vis both the Soviet Union and United States during the Cold War, and with the United States today? At least amongst major powers, is this a uniquely United States story, a U.S.-USSR story, or will China also join the ranks of the MAD-dissatisfied? These are important questions for the future of nuclear stability.

Finally, Green extends his analysis to regional powers, where the desire to escape MAD may be growing, especially in the India-Pakistan dyad. Here I would add one more implication of Pure MAD that is worthy of further interrogation, both in regional dyads but also increasingly in great power dyads as well: the so-called stability-instability paradox. MAD argues that once a general condition of strategic nuclear stability holds, states may actually engage in higher frequency lower-level conflict, with higher levels of instability at the conventional (or sub-conventional level). MAD’s assumption is that nuclear states are willing to trade a higher frequency of lower-level instability for this higher-level nuclear stability—perhaps more frequent terrorist attacks or proxy wars in exchange for avoiding nuclear annihilation. Is this assumption true? India’s

²⁵ See Keir Lieber and Daryl Press, “The New Era of Counterforce: Technological Change and the Future of Deterrence,” *International Security* 41:4 (Spring 2017): 9-49.

experience suggests it may not be. After two decades of suffering terrorist attacks sponsored by nuclear-armed Pakistan, India's public and leadership are asking how much of this they have to tolerate from behind Pakistan's nuclear shield. After unsuccessful attempts to develop credible conventional deterrents to such terrorist attacks, India may be flirting with notions of counterforce as well in order to escape the constraints of MAD, but—as the conventionally superior power—particularly the implication known as the stability-instability paradox. One can imagine similar dynamics in a future hypothetical Iran-Israel nuclear dyad, where Israel develops counterforce capabilities to attempt to disarm nuclear Iran. In both cases, it is not merely the assumption of automatic survivability that is at risk, with small arsenals and improving counterforce technologies, but a strategic logic driven by the unwillingness to trade lower levels of high intensity instability for nuclear stability, as MAD forces states to accept.

In sum, Green has written a landmark book that challenges some of the core assumptions of the nuclear field. If in fact MAD and TNR are elegant theoretical constructs, but whose assumptions and criteria are rarely met in the empirical world, that has enormous—and worrying—implications for the future of nuclear competition in stability, especially as we stand on the brink of a new nuclear era that may see the emergence of nuclear weapons powers in the Middle East and East Asia. You may agree with his theory and analysis, or you may not. Regardless, it will now be impossible to assign or cite Jervis, Glaser, Sagan, Mearsheimer, Posen, and others without including Green in their company.

REVIEW BY MARC TRACHTENBERG, UNIVERSITY OF CALIFORNIA, LOS ANGELES

The Revolution that Failed is an important book. It is important above all because it demonstrates that some key assumptions that lie at the heart of most scholars' thinking about nuclear issues are simply wrong.

And what exactly have most of us in this field been wrong about? For many years, we took it for granted that when the USSR in the 1960s acquired survivable nuclear capabilities—that is, forces that could ride out an American attack, no matter how massive it was or how rapidly it was mounted, and then go on to utterly destroy the United States as a functioning society in a retaliatory strike—international political life had been changed in some very fundamental ways. The Americans already had that kind of capability, but when both sides had it, neither could rationally threaten to launch a full-scale nuclear attack against the other. And our assumption was that once things had reached that point, that new world—the world of Mutual Assured Destruction or MAD—was essentially here to stay. Nuclear superiority was essentially beyond reach, but one really didn't have to worry much about falling behind either. The strategic balance, in fact, did not have much meaning in such a world; the nuclear competition had become a standoff; the long-predicted 'balance of terror' had finally arrived. There was, it seemed, no realistic way of breaking out of the stalemate because efforts to achieve some sort of meaningful edge could always be thwarted relatively easily.

These were, of course, basically empirical assumptions, but they had all sorts of implications about how international politics would or should work in a nuclearized world. They suggested that since it was pointless to strive for strategic advantage, the two sides should just accept that fact and build their relationship on that basis. They should agree that a major nuclear war was unwinnable and should therefore never be waged. They should adopt military policies that focused on building secure retaliatory forces and were in no way designed for a first strike against the adversary. The basic thrust of that line of argument, therefore, was that nuclear forces should be depoliticized—that their only legitimate function, as Robert McNamara famously put it, was to “deter one's opponent from using them”²⁶—although some leading theorists felt that even in such a world one could draw some political value from those forces by taking of advantage of the fact that in a major non-nuclear war there was always a risk that matters could escalate to the nuclear level, and indeed that this threat of semi-inadvertent escalation could be deliberately manipulated, presumably on behalf of an essentially defensive American policy.

That set of ideas—the “theory of the nuclear revolution” as Robert Jervis called it—is Brendan Green's main target in this book.²⁷ His critique of common assumptions about force survivability and the ineffectiveness of counterforce targeting, the key empirical point which that theory is based on, is developed mainly in the second chapter. The analysis is not entirely new—it builds on a series of articles, co-authored with Austin Long, which Green has published over the past few years—but is developed quite effectively.²⁸ It is obvious that Green has a deep understanding of operational realities, and the evidence he presents, often from newly available archival and interview sources, is really quite extraordinary. One of the main assumptions, for example, supporting the standard view is that nuclear missile-carrying submarines were essentially invulnerable to attack. But it turns out that this was not the case at all for the period he was analyzing: “A very highly placed former American intelligence official,” Green writes, “among the most cautious and circumspect of those I have talked to about the undersea balance, told a co-author and me that during this period [the 1970s], ‘we could have taken out the entire deployed [Soviet submarine] fleet on a signal’” (37). The key finding is thus that the nuclear “stalemate” has been much less

²⁶ Robert S. McNamara, “The Military Role of Nuclear Weapons: Perceptions and Misperceptions,” *Foreign Affairs* 62:1 (Fall 1983): 261-271, here 79.

²⁷ See Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca: Cornell University Press, 1989).

²⁸ See especially Brendan Rittenhouse Green and Austin Long, “Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy,” *Journal of Strategic Studies* 38:1-2 (February 2015), 38-73, and Green and Long, “The MAD Who Wasn't There: Soviet Perceptions of U.S. Counterforce Capabilities in the Late Cold War,” *Security Studies* 26:4 (October-December 2017): 606-641.

solid, and the nuclear balance more meaningful and manipulable, than we had been led to believe. Given the way we have come to think about nuclear issues, it is hard to exaggerate the importance of that conclusion.

But Green does more in this book than simply present a beefed-up version of the argument he and Long put forward in their articles. He does a lot more, that is, than just show, mainly on empirical grounds, how open to challenge the standard view in this area is. The argument here also has a strong theoretical component. The book presents an argument about how nuclear weapons policy is actually shaped, and that argument is systematically compared with the prevailing view in this area. Actually, Green divides that view into two parts, which he calls “Pure MAD” and “Parochial MAD.” “Pure MAD” is the idea that the inescapability of the nuclear stalemate is so obvious that the MAD approach to the problem would naturally be directly translated into policy. This is something of an artificial construct, since it has long been clear to even the most convinced believers in MAD that in reality both the United States and the Soviet Union sought to generate forces that would in theory give them a certain advantage in a war. Since to its proponents the logic of the Nuclear Revolution Theory was so strong, the assumption was that other not-so-rational factors must have come into play. The idea was that “parochial” forces, and especially what was viewed as the somewhat irrational interest of the military in nuclear warfighting, must have prevented governments from pursuing the only fully rational policy. So, the real heart of the book is a systematic comparison between that view—“Parochial MAD”—and Green’s own view, what he calls (borrowing the term from the famous nuclear strategist Albert Wohlstetter) the “Delicate Nuclear Balance” view.²⁹

In setting up the analysis, Green makes an important methodological point. He notes that “Parochial MAD” arguments generally have a certain post-hoc quality. It was, as a rule, simply assumed that parochial forces must have been responsible for what was clearly a misguided policy; those who made that assumption then looked around for evidence to support that view. They seemed to assume, in other words, “that since Pure MAD is correct, and competitive nuclear policies are crazy, these policies must be caused by some irrational force. It is enough simply to grab the first available hypotheses and examples that come to mind, because it is only necessary to make a plausible case” (20). The theory thus did not begin with an analysis of the various “parochial” forces which might have come into play and then seek systematically to figure out how they have might affected policy. But Green argues that if we’re serious about these matters we really need to approach the issue in that more systematic way, since parochial forces might have played a role on *both* sides of the issue. In that case, those various forces might have simply canceled each other out. It’s even possible that pro-MAD parochial forces (especially in Congress and in parts of the military) might have been stronger than those on the other side. And doing that systematic analysis allows him to reach the important conclusion that “the late Cold War nuclear competition occurred” not because parochial forces had come to dominate the policy-making process, but rather because “American leaders chose it” since they “thought it served their strategic purposes” (8).

But even if true, the problem does not quite end there since we still need to deal with the question of whether the political leadership was being rational when it made the choices it did. After all, Green himself admits that “nuclear stalemate persisted throughout the Cold War,” and that the “American documentary record is replete with examples of leaders bluntly confirming the existence of nuclear stalemate” (43-44). Doesn’t that in itself strongly suggest that the U.S.-Soviet nuclear stalemate was for all practical purposes inescapable? Even if the Americans had come close to acquiring something close to a disarming first-strike capability, wouldn’t the prospect of a mere handful of surviving weapons being launched in a retaliatory strike be enough to keep the United States from striking first? And if, for all practical purposes, the force could not be used, how then could the threat to use it have any political value? And if it had no real value, wasn’t it irrational for political leaders to try to develop a capability of that sort?

Green, however, has an answer to that kind of argument, and the way he deals with it is very much worth noting. His main point here is sounded in the first and last paragraphs of the second chapter in the book. He begins that chapter by referring

²⁹ See Albert Wohlstetter, “The Delicate Balance of Terror,” *Foreign Affairs* 37:2 (January 1959), <https://www.jstor.org/stable/i20029342>.

to Wohlstetter's famous 1959 article, "The Delicate Balance of Terror."³⁰ Deterrence depended on the ability to retaliate, and that capability, Wohlstetter argued, was harder to achieve than people thought. Six hurdles had to be overcome. The force, for example, had to be able to survive an enemy's surprise attack, and it had to be able to penetrate the enemy's defenses. And all six hurdles had to be cleared in order for deterrence to be effective. "Prizes for a retaliatory capability," he wrote, "are not distributed for getting over one of these jumps. A system must get over all six." But Wohlstetter, Green argues, was quite mistaken in that regard—and his point here applies not just to the defender but to the attacker as well. "Prizes are indeed awarded," he says, "to states that can overcome individual hurdles" not just in maintaining a deterrent force but in developing the ability to neutralize the enemy's nuclear force. And this, he says, is true "even if nuclear stalemate is never escaped" (47). Given what is at stake, any movement by either side, no matter how incomplete, toward a full first-strike capability is bound to be of great concern to both sides and is therefore bound to have a major political impact. This is why, he argues, there can be "profit in peacetime military competition beyond its potential utility in a crisis" (47). In terms of theory, this is perhaps the single most important contribution the book makes. And that point sets the stage for much of the historical analysis in the rest of the book, which is devoted to showing, on the basis of the historical evidence, that a "peacetime military competition" can make political sense—and thus that the reaching for strategic advantage was by no means as irrational as many theorists have argued.

All this I found quite convincing—and important. A whole body of thought about nuclear issues is based on the empirical claim that anything like a disarming first-strike capability is utterly beyond reach once nuclear forces have reached a certain level; since Green finds that the claim is inaccurate, his finding is bound to have far-reaching, and fairly obvious, implications. But for me, as an historian, one point stands out above all others, and that is that Green's findings have an important bearing on how the Cold War, and especially the later Cold War, is to be understood.

For the basic point here is that if the strategic balance can, in principle, be altered in politically meaningful ways, then how much of an effort each side puts into altering it can be a decisive factor in determining political outcomes. The political competition is in that way transformed into an economic competition; relative economic strength can thus play a key role in determining how the political conflict runs its course. And, for me at least, it's hard to avoid the conclusion that it was probably on balance a good thing that objective factors of that sort played such a central role in the story. The world of Mutual Assured Destruction, in which political outcomes would be determined by subjective factors—and above all by which side was willing to go furthest in exploiting the "threat that leaves something to chance"—might well have been a good deal less stable than the world that actually existed.

³⁰ Wohlstetter, "Delicate Balance," 216, 219-21.

RESPONSE BY BRENDAN RITTENHOUSE GREEN, UNIVERSITY OF CINCINNATI AND CATO INSTITUTE

I am deeply grateful to Fiona Cunningham, Charles Glaser, Vipin Narang, and Marc Trachtenberg for taking the time to read my book with such care, and for offering comments of such acuity. I am grateful as well to Caitlin Talmadge for organizing this forum and for her sterling introduction. It is difficult for me to imagine a better set of reviewers, or a more thorough treatment of my work. I am deeply obligated to all five. Below I offer a few responses to some of the issues they raise.

Narang and Trachtenberg are effusive in their praise for the book, far beyond what it deserves. Trachtenberg simply lays out my argument and makes a case for its importance—far better, I fear, than I did myself—without making any criticisms. I can therefore only express my profound gratitude to him: for this review; for his mentorship; and above all for his intellectual and personal example.

Narang raises three issues. The first is the centrality of credible extended deterrence. He posits that alliance cohesion may be the most powerful and important of the peacetime benefits from nuclear competition that I propose. After all, the “unique requirements of non-contiguous extended deterrence” stemming from U.S. Cold War grand strategy would seem to have incentivized Washington to seek nuclear superiority in order to bolster the confidence of its NATO allies that they would actually have been defended in the crunch.

I basically agree with Narang that alliance cohesion was an especially powerful motive for American leaders during the Cold War. Interestingly, I found only some direct evidence that policymakers linked alliance cohesion with credibility stemming from the strategic balance during the 1970s (100-103). Instead, European allies were often much more concerned with the theater nuclear balance, and with Soviet beliefs about the theater balance (138-139, 166-167, 173-174, 212-214, 228-231). Such emphasis can perhaps be explained by the fact that even a purely conventional war would have been devastating to the Europeans, leading them to prioritize the threat of quick nuclear escalation in the theater as a primary deterrent.³¹ But more research is required to test this and other conjectures.

Second, Narang asks whether the American desire to escape nuclear stalemate was unique, or whether it extends to other states. The Cold War Soviet Union may have just been reacting to American nuclear excesses, while both Cold War and contemporary China seem to be satisfied with much less robust arsenals than my theory would predict (a point that Cunningham also raises).

Though full answers must await the further opening of Cold War archives in Russia, I suspect that Washington was the more enthusiastic of the two superpowers in trying to escape nuclear stalemate. The American advantages in qualitative technological competition allowed it to put pressure on the Soviet arsenal in ways that were difficult for Moscow to match. However, while the Russians may have been less interested in escaping nuclear stalemate, they were not uninterested. Soviet constitutional fitness suffered from much poorer civilian control over the military (61, 63), meaning that the Red Army’s organizational proclivities often found their way into nuclear policies that challenged the American deterrent. Moving farther east, I must frankly admit that I find Cold War China’s nuclear policies puzzling. Beijing seemed content with a very limited nuclear posture most of the time, while occasionally becoming extremely anxious about the possibility of nuclear use, such as in the 1969 Sino-Soviet crisis. My theory cannot explain the case. I address the case of contemporary China below.

Third, Narang wonders about the relevance of my arguments for the stability-instability paradox, the idea that nuclear stalemate permits or incentivizes competition below some threshold of violence. He notes that India appears less and less

³¹ For some preliminary investigations along these lines, see Brendan Rittenhouse Green and Caitlin Talmadge, “When the Strong Suffer What They Must: Asymmetric Alliances and Nuclear Escalation Risk” (draft paper, 2020).

willing to tolerate lower level violence from Pakistan, explaining a substantial amount of the competition that I note in applying my theory to the subcontinent, and suggesting that the pattern could spread to other future nuclear dyads.

Since I rely more or less entirely on Narang for my knowledge of India and Pakistan, I think I cannot do much better than simply agreeing with him. I will further note that he is right to raise the theoretical importance of the stability-instability paradox. Omitted from my book, the paradox cries out for further analysis, especially as it increases in prominence among regional nuclear powers.

Cunningham begins her review by asserting that there is a disconnect, in my theoretical logic, between the supposed benefits of peacetime nuclear competition and the total absence of war or crisis bargaining under nuclear stalemate. After all, “the benefits of peacetime competition...all depend on the premise that a bigger, more sophisticated arsenal affects an adversary’s calculations in a crisis or conflict, even if [mutual assured destruction] MAD remains,” a premise for which there is little evidence. This alleged defect leads her to ask how rational U.S. policymakers really were when they pursued peacetime competition, highlighting a number of quotations from Cold War policymakers about their justifications for competitive policies that can be found in the book.

But it is not the case that the peacetime benefits of competition depend on obtaining a crisis bargaining advantage even if nuclear stalemate remains, as Cunningham claims. On the contrary, the central insight of my argument is that even if nuclear stalemate endures, successful arms racing can enhance general deterrence, improve alliance cohesion, divert the adversary’s defense resources, and incentivize it to make political adjustments. It is no surprise, then, that Secretary of State Henry Kissinger believed counterforce capabilities would bolster NATO’s cohesion (102) and divert Soviet defense resources (136). Nor is the fact that Kissinger, Secretary of Defense Harold Brown, and National Security Advisor Zbigniew Brzezinski all thought Limited Nuclear Options (LNOs) could provide better crisis bargaining leverage than the Single Integrated Operational Plan (172, 220, 227)—especially when LNOs were tailored to address troubling Soviet military beliefs—since these crisis benefits do not require escaping stalemate either. In short, the prospect of obtaining the primary advantages of competition depends only on the adversary being responsive to uncertainty about its future assured destruction capability.

Such responsiveness is perhaps the heart of Cunningham’s concern, as the rest of the issues she flags relate to the scope conditions of my arguments—conditions that might exclude China’s small, relatively stable, and generally MAD-like arsenal. Cunningham notes that my argument depends on “politically salient status quo ambiguities” between nuclear rivals, while proposing that China’s maritime disputes with the U.S. (through its allies) and its border dispute with India are unlikely to ever be salient enough to warrant a nuclear detonation, and therefore are poor candidates for driving nuclear competition. She also suggests that “assured destruction” is an artificially high threshold for nuclear stalemate, observing that China appears have accepted mutual vulnerability without competition at a much lower level of damage. Finally, she joins Narang in wondering if the U.S. is really a unique case, pointing in particular to Washington’s uniquely ambitious grand strategy. If the U.S. is making the nuclear balance delicate, and thus driving other states to arms race in order to keep their deterrents survivable, then it is U.S. grand strategy, rather than any nuclear theory, that is causing nuclear competition.

Cunningham puts her finger on a key issue with regard to the political salience of disputes about the status quo. My rule of thumb would be that any issue serious enough to fight a conventional war over is serious enough to spark nuclear competition. I defer to my colleague’s regional expertise as to whether Chinese maritime and border disputes fall in or out of this set, but I am not aiming to exclude China with this criterion, which follows logically from the structure of my argument (21-23, 80).

As far as the assured destruction threshold goes, I would not exclude a state from my theory’s predictions just because its arsenal fails to reach an assured destruction threshold. As mentioned above, I find China’s Cold War nuclear behavior puzzling in this regard. In contrast, China’s present push towards a larger arsenal with greater survivability is perfectly explicable by my theories. But if Beijing stops well short of an assured destruction capability—as most China security specialists seem to expect—then my theory will be falsified with respect to China.

Finally, America's globe-girdling grand strategy is definitely a cause of politically salient status quo ambiguities, and in this sense is also a cause of nuclear competition, both today and in the past. But I do not think it is correct to say that arms races based on the "delicate nuclear balance" mechanism—whether or not they are prompted by American nuclear policy—are somehow less problematic for Pure MAD. In Chapter One, where I evaluate Pure MAD on its own terms, I quote Kenneth Waltz saying that "strategic arms races are . . . pointless" and military "balances are inherently stable;" Robert Jervis arguing that under nuclear stalemate, "Neither side need acquire more than a second-strike capability and, if either does, the other need not respond since its security is not threatened"; McGeorge Bundy describing nuclear procurement under nuclear stalemate as "tens of billions [of dollars] for nothing"; and Charles Glaser saying that "nuclear weapons essentially eliminate the security dilemma (all quotes 14)."³²

Clearly, the logic of Pure MAD requires that arms races peter out. The weaker power should eventually reach nuclear stalemate and declare that enough is enough. And the stronger power should also quit at this point, since Pure MAD holds stalemate to be permanently entrenched. That the late Cold War nuclear arms race nevertheless occurred—after the threshold for nuclear stalemate had been reached by any measure—is a major problem for Pure MAD. Arms races between asymmetric nuclear powers under nuclear stalemate today are equally problematic.

Glaser's review is the most critical, though he is both measured in his rhetoric and generous in his treatment of my arguments. He has three major complaints.

First, Glaser questions both my construal of Pure MAD's predictions and my demonstration that the nuclear balance was delicate during the later Cold War. Glaser quotes my claim that Pure MAD predicts that "states can afford to ignore their opponent's build-up (31)." In contrast, he contends that Pure MAD predicts that a "state may need to respond and should respond vigorously if its overall retaliatory capabilities are in jeopardy" from technological change or the (irrational) competitive policies of its adversaries. After all, he argues, hedging against such developments was the whole point of the triad. At the same, he argues that U.S. vulnerabilities in its bomber, Intercontinental Ballistic Missiles (ICBMs), and nuclear C³ capabilities were well known by Pure MAD's Cold War advocates, who nevertheless believed the U.S. possessed a robust deterrent. Only my finding that U.S. nuclear forces threatened "the USSR's *future* assured destruction capability" requires a reassessment of Pure MAD.

I am not sure we really disagree. The full quotation from my book about Pure MAD reads "[States] can afford to ignore their opponent's buildup, and if they absolutely need to hedge against the amazingly improbable, they can invest in further measures for nuclear force survivability (31)." In Chapter Four, I argue that Pure MAD predicts statesmen will "prefer an acquisition policy that reduces nuclear force structure where possible, and that otherwise is limited to prudent investments in force survivability (69)." I also agree that the future survivability of the U.S. Cold War nuclear arsenal was relatively robust, especially compared to its Soviet counterpart. So, it appears to me that Glaser and I are basically on the same page with regard to Pure MAD's predictions and the empirical facts about Cold War nuclear arsenals.

Glaser's second critique is that my argument "exaggerates the benefits of simply creating adversary uncertainty about its assured destruction capability." My proposition that this uncertainty can impact general deterrence—the adversary's selection into and out of crisis confrontations—"would accrue to only a small slice" of nuclear balance outcomes, Glaser contends. Moreover, he argues that the effect would be modest when "escape [from nuclear stalemate] is both uncertain and likely quite limited," and that, "Future uncertainty would have no impact on an adversary's current decisions about whether to launch a crisis." In short, general deterrence benefits are hard to get, probably small, and non-existent unless stalemate has

³² For original sources see: Scott Douglas Sagan and Kenneth N Waltz, eds., *The Spread of Nuclear Weapons: A Debate Renewed* (New York: W.W. Norton, 2002), 30–31; Robert Jervis, "Why Nuclear Superiority Doesn't Matter," *Political Science Quarterly* 94:4 (December 1979): 618; McGeorge Bundy, "To Cap the Volcano," *Foreign Affairs* 48:1 (October 1969): 13; Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton: Princeton University Press, 1990), 95, 97, 97 n. 110.

actually been escaped. The implication is that “less competitive policies that are designed not to challenge an adversary superpower’s assured destruction capability will usually remain a country’s best option.”

Two points are worth making in response. First, by focusing only on general deterrence, Glaser ignores the other types of peacetime benefits that can accrue from competitive nuclear policies: adversary resource diversion, political adjustment, and alliance cohesion. I suspect that Glaser may regard these as trivial benefits, but U.S. Cold War policymakers valued them highly, as I repeatedly demonstrate in the book (100-103; 136-139; 172-174; 178-182; 226-231). Moreover, the major non-fiscal costs of successful arms racing are forgone arms control benefits, which were minimal for the Cold War United States because of its constitutional fitness problems (55-65). To put it bluntly, the much ballyhooed “spiral model” costs of nuclear arms racing are overstated. I made this point in the book with repeated reference to Glaser’s own work (52-55), which he fails to take up in his review.³³ The bottom line is that even if Glaser was correct about general deterrence, his broad conclusion that it doesn’t pay to threaten the adversary’s assured destruction capability does not follow.

The general deterrence question, too, is more complicated than Glaser allows. I agree that future uncertainty about the nuclear balance, in and of itself, does not impact present crisis bargaining. However, as Cunningham notes in her review, I argue that successful arms racing policies can increase an adversary’s present uncertainties about the nuclear balance “even if they do not yet provide a military advantage (50).” An adversary’s surprise at a rapidly changing future balance can cause it to become more cautious in the present, unsure of what it has missed. We can see this mechanism at play in the very cautious U.S. attitude towards crisis response planning in 1950-51, after the Soviets unexpectedly burst the nuclear monopoly, and in the Soviet Union’s behavior during the early 1980s “war scare.”³⁴

I also agree with Glaser that a limited and/or highly uncertain escape from nuclear stalemate provides only limited and/or highly uncertain general deterrence value. I suspect that our real difference is about what constitutes a “limited and/or uncertain” escape as opposed to something more substantial and/or probable. I doubt that this “how much is enough” question can be answered in advance, but the history of warfare leads me to believe that great powers are basically bloodthirsty murderers that ruthlessly pursue their goals in the face of enormous costs.³⁵ I would not be surprised at all if the typical great power, in the end, proves willing to tolerate a war with millions of deaths and trillions in economic damage, so long as it emerges from the war a coherent, organized entity and its rival does not.

My pessimistic worries aside, the Cold War superpowers were unwilling to assume their opponent could be deterred by lesser threats than assured destruction. Glaser concedes that the Soviets were staring down the barrel of a future world where their assured destruction capability was gone. The prospect of this world, by itself, was enough to spur strenuous efforts to avoid it.³⁶ Had it nevertheless come to pass, Moscow might have been very reluctant to select into crises over any but its most vital interests.

Glaser’s third criticism is that my evidence in favor of my own theories and against Parochial MAD’s predictions is not very impressive. The policy debates I document are “far less strategically sophisticated than we might reasonably hope” and

³³ Charles L. Glaser, *Rational Theory of International Politics: The Logic of Competition and Cooperation* (Princeton: Princeton University Press, 2010), 62; Glaser, *Analyzing Strategic Nuclear Policy*, 72, 150–53, 158, 160–61, 249–52.

³⁴ On the early 1950s and 1980s, see, respectively, Marc Trachtenberg, *History and Strategy* (Princeton: Princeton University Press, 1991), 115–32; Brendan Rittenhouse Green and Austin Long, “The MAD Who Wasn’t There: Soviet Reactions to the Late Cold War Nuclear Balance,” *Security Studies* 26:4 (October 2017): 620-622.

³⁵ For an excellent summary of what states have been willing to suffer and risk in war, see Keir A. Lieber and Daryl G. Press, *The Myth of the Nuclear Revolution: Power Politics in the Atomic Age* (Ithaca: Cornell University Press, 2020), 11–13.

³⁶ Green and Long, “The MAD Who Wasn’t There,” 623-639.

“marred by incoherence.” Meanwhile, I underplay military influence on arms control by failing to note that the U.S. Air Force was not interested in Multiple Independently Targeted Reentry Vehicles (MIRVs) until they became accurate enough for counterforce missions. I also ignore the fact that the military could exert its influence through Congress, as U.S. Strategic Arms Control Treaty (SALT) negotiator Gerard Smith argued and National Security Advisor Henry Kissinger reportedly acknowledged.

I have two reactions to this evidentiary critique. First, it is neither surprising nor all that important that Cold War leaders did not meet Glaser’s demanding standards for, *inter alia*, making references to residual Soviet weapons or equivalent megatonnage (EMT) each time they confronted nuclear policy. It is not surprising because leaders are severely time pressured and focus only on the details in front of them; because nuclear policy decisions are confronted in sequence and often without fulsome balance assessments in the briefing materials; because many of the best nuclear balance assessments and discussion of them remain fully classified or heavily redacted; and because an explicit endorsement of undermining Soviet assured destruction capabilities would have been leaked immediately and quashed in Congress.³⁷

It is not important because my argument does not require that policymakers anticipate any particular level of damage limitation as the ultimate outcome of nuclear competition. What matters is that policymakers monitored the nuclear balance carefully, believed it was delicate, endorsed counterforce capabilities in the context of that delicacy, and thought that those capabilities would affect the balance enough to induce reactions among allies, neutrals, and adversaries that would provide peacetime benefits. If these predictions are jointly confirmed, it is highly unlikely that some other theory explains why the U.S. ended up with a competitive nuclear policy (76-79). Of course, my theoretical explanation is more powerful the more plausible escape from nuclear stalemate becomes, and I would love to know exactly how far policymakers thought they could get in this regard. But simple analysis from the book shows that escape from stalemate was plenty plausible, and that the U.S. came close to escaping under at least some salient conditions (33, 36-39, 41).³⁸

My second reaction is that Glaser’s demanding evidentiary standards seem not to apply where Pure and Parochial MAD are concerned. One would think that if these theories were correct, there would be an abundance of statements in the record to the effect that “nuclear stalemate is forever, so why bother with X program?” or “These counterforce programs are terrible, but the Joint Chiefs of Staff (JCS) have us over a barrel,” or “someone figure out how to buy off the military so I can have SALT.” The general absence of such statements ought to be quite surprising to adherents of Parochial MAD.

Nor does Glaser’s defense of the influence of the military over competitive nuclear policies stand up to scrutiny. He makes two points. First, he cites Ted Greenwood for the proposition that the Air Force endorsed MIRV only after its accuracy for counterforce improved, showing that it was a strong constituency for hard target kill capabilities. But I illustrate in the book that the Air Force had a much more diffuse preference for MIRV, which it mostly wanted to use against air defenses and the unhardened “other military target” category (116-117). Moreover, under President Jimmy Carter the Air Force was willing

³⁷ Several of these points are illustrated by a document that Glaser calls a “partial exception” to the generally “unsophisticated” policymaker discourse I document—a National Security Council analysis of a potential Minuteman Reentry Vehicle (RV) (132). Glaser notes that despite its mention of a pathetic number of surviving Soviet ICBMs (and this before either the MX ICBM or the Trident II Submarine Launched Ballistic Missile [SLBM]!), it lacks an analysis of SLBM survivors. But a) the issue of the day was the RV and what it could do, which did not include targeting SLBMs at sea, b) the antisubmarine warfare capability analysis needed to address SLBMs was one of the government’s most highly classified secrets and was never discussed with any analytic detail in any document I have seen, and c) the only reason the issue was being discussed at all was because the Pentagon’s plans had been leaked to Congress; the NSC analysis was itself an attempt to undermine the administration’s policy.

³⁸ As a State Department assessment looking forward from the mid-1970s noted: “*With M-X deployed*, the Soviets could expect to lose *nearly 90 percent* of their *total* strategic warheads from a U.S. first strike in the mid-1980s. This is a reasonably close approximation of a disarming first strike.” Goodby and Lord to Kissinger, 16 November 1976, *Foreign Relations of the United States 1969–1976*, vol. 35 (Washington, D.C.: U.S. Government Printing Office [GPO], 1984), 459. Emphasis in the original. For a thorough run-down of how U.S. and Soviet policymakers might have seen the balance, see Green and Long, “The MAD Who Wasn’t There,” 610–12.

to trade away virtually all of its hard target capability if it could keep B-1 (240). As parochial interests go, this one does not seem so powerful.

Second, Glaser argues that the military shaped force posture outcomes through its ability veto arms control treaties, citing Steven Miller on the general point, and Gerard Smith and Raymond Garthoff saying this was the cause of MIRV not being banned in SALT.³⁹

This evidence amounts to the following: Miller made an observation based on Jimmy Carter's memoir; Smith proposed an unsupported (and highly motivated) explanation for why his policy preferences were not adopted; and Garthoff passed on an anonymous secondhand story. Including Greenwood's work, the dates on these sources are 1975, 1984, 1980, and 1985. I believe we are in a position to provide better evidence about parochial forces now that primary documents are available.

And those documents reveal the story pretty clearly: there was no MIRV ban because it would require a unilateral moratorium on testing, which the Nixon administration feared Congress would never rescind even if the Soviets cheated on it. In the meantime, the Soviets could string out arms control negotiations to their advantage, closing qualitative gaps while continuing their quantitative build-up. Nixon, Kissinger, Secretary of Defense Melvin Laird, Secretary of State William Rogers, Harold Brown, and Deputy Secretary of Defense David Packard all rejected a MIRV moratorium on these grounds (108-9). Even Gerard Smith agreed that "once we are committed to a moratorium, it may be very difficult to get out of" (108). Further to the general point, no less than President Carter (who entered into the office looking at SALT with lust in his heart) refused to promise anything to the JCS for SALT II; Harold Brown was happy to take the Chiefs to the woodshed rather than give in to their increasingly hysterical threats (241). In short, a MIRV ban was hamstrung by U.S. constitutional fitness problems, and the JCS could neither stop SALT II nor get themselves a payoff. Military influence on competitive nuclear policies has been greatly exaggerated.

³⁹ See Glazer's citations above.