


RESEARCH ARTICLE

Casting the atomic canon: (R)evolving nuclear strategy

Kjolv Egeland^{1*} , Thomas Fraise¹ and Hebatalla Taha^{1,2}

¹Sciences Po, Center for International Studies (CERI), CNRS, Programme on Nuclear Knowledges, Paris, France and

²American University in Cairo, Department of Political Science, Cairo, Egypt

*Corresponding author. Email: kjolv.egeland@sciencespo.fr

(Received 11 December 2020; revised 15 September 2021; accepted 20 October 2021; first published online 9 December 2021)

Abstract

Looming decisions on arms control and strategic weapon procurements in a range of nuclear-armed states are set to shape the international security environment for decades to come. In this context, it is crucial to understand the concepts, theories, and debates that condition nuclear policymaking. This review essay dissects the four editions of *The Evolution of Nuclear Strategy*, the authoritative intellectual history of its subject. Using this widely acclaimed work as a looking glass into the broader field of nuclear security studies, we interrogate the field's underlying assumptions and question the correspondence between theory and practice in the realm of nuclear policy. The study of nuclear strategy, we maintain, remains largely committed to an interpretive approach that invites analysts to search for universal axioms and to abstract strategic arguments from the precise circumstances of their occurrence. While this approach is useful for analysing the locutionary dimension of strategic debates, it risks obscuring the power structures, vested interests, and illocutionary forces shaping nuclear discourse. In the conclusion, we lay out avenues for future scholarship.

Keywords: Nuclear Strategy; Strategic Studies; Arms Control; Knowledge Production; Intellectual History

Introduction

In the preface to the second edition of *The Evolution of Nuclear Strategy*, published in 1989, Lawrence Freedman concluded that 'the intellectual exhaustion of nuclear strategy' had finally been 'matched by its political exhaustion'.¹ The period since, it would seem, has proved restorative. While nuclear strategy and security studies are currently said to be undergoing a 'renaissance' or 'revival',² the world's nine nuclear-armed states are all devoting significant resources into expanding or 'modernising' their nuclear armouries.³ A range of observers argue that 'a new Cold War' is underway.⁴ Much of the arms control architecture designed during and after

¹Lawrence Freedman, *The Evolution of Nuclear Strategy* (2nd edn, London, UK: Palgrave Macmillan, 1989), p. xi.

²Campbell Craig and Sergey Radchenko, 'MAD, not Marx: Krushchev and the nuclear revolution', *Journal of Strategic Studies*, 41:1–2 (2018), pp. 208–33; Nicholas L. Miller and Vipin Narang, 'North Korea defied the theoretical odds', *Texas National Security Review*, 1:2 (2018), pp. 58–74; Scott Sagan, 'Two Renaissances in Nuclear Security Studies', H-Diplo/ISS Forum (15 June 2014), available at: {<https://issforum.org/ISSF/PDF/ISSF-Forum-2.pdf>}.

³Hans M. Kristensen and Matt Korda, 'Status of World Nuclear Forces', Federation of American Scientists (May 2019), available at: {<https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>}.

⁴Niall Ferguson, 'The new cold war? It's with China and it has already begun', *The New York Times* (2 December 2019), available at: {<https://www.nytimes.com/2019/12/02/opinion/china-cold-war.html>}; Robert D. Kaplan, 'A new cold war has begun', *Foreign Policy* (7 January 2019), available at: {<https://foreignpolicy.com/2019/01/07/a-new-cold-war-has-begun/>}. See also Graham Allison, *Destined for War* (Boston, MA: Houghton Mifflin Harcourt, 2017); Øystein Tunsjø, *The Return of Bipolarity in World Politics* (New York, NY: Columbia University Press, 2018); Robert D. Kaplan, *The Return of Marco Polo's World* (New York, NY: Random House, 2018).

the Cold War has been purposefully dismantled,⁵ and nuclear-armed leaders appear more willing than before to glorify their weapons and issue overt nuclear threats to their adversaries.⁶ In 2019, the UN Secretary-General established that a ‘qualitative nuclear arms race is underway’.⁷ In this context, a new and updated edition of *The Evolution of Nuclear Strategy*, widely considered the seminal introduction to its subject,⁸ is timely.

Despite a proliferation of security studies handbooks since its first publication in 1981, *The Evolution of Nuclear Strategy* has retained its position as the go-to survey of the subject, with scholars from across the field describing it as ‘the bible’,⁹ ‘magisterial’,¹⁰ ‘ever helpful’,¹¹ ‘a masterpiece’,¹² and ‘the most incisive and clear-eyed’ contribution to the literature.¹³ Indeed, scholars from all mainstream strands of nuclear security studies routinely invoke the book as the authoritative treatment of nuclear history. Since its first edition, the book has been favourably received as a wide-ranging intellectual history of nuclear strategy¹⁴ – a historical investigation of the central ideas, concepts, and debates that define nuclear strategic studies, a subdiscipline of security studies devoted largely to the question of how states (ought to) navigate nuclear technologies in an anarchic world.¹⁵ While there are ongoing discussions about the relationship between ‘strategic’ and ‘security’ studies, and about how they fit within the broader field of International Relations,¹⁶ the two are clearly intertwined and overlapping, especially when it comes to the study of nuclear thinking and practice.

The Evolution remains one of the most frequently referenced works on nuclear weapons and security.¹⁷ Arguably, its importance derives primarily from its function as a broad overview: *The*

⁵Götz Neuneck, ‘The deep crisis of nuclear arms control and disarmament’, *Journal for Peace and Nuclear Disarmament*, 2:2 (2019), pp. 431–52.

⁶Nina Tannenwald, ‘The vanishing nuclear taboo?’, *Foreign Affairs*, 97:6 (2018), pp. 16–24.

⁷António Guterres, ‘Remarks at commemoration of the international day for the total elimination of nuclear weapons’, *UN News* (26 September 2019), available at: {<https://www.un.org/sg/en/content/sg/speeches/2019-09-26/commemoration-of-international-day-for-elimination-of-nuclear-weapons-remarks>}.

⁸See, for example, Benjamin Wilson, ‘Keynes goes nuclear: Thomas Schelling and the macroeconomic origins of strategic stability’, *Modern Intellectual History*, 18:1 (2021), pp. 171–201 (p. 172); Vojtech Mastny, ‘The new history of cold war alliances’, *Journal of Cold War Studies*, 4:2 (2002), pp. 55–84 (p. 63); Lawrence J. Vale, *The Limits of Civil Defence in the USA, Switzerland, Britain and the Soviet Union* (New York, NY: St Martin’s Press, 1987), p. 7.

⁹Beatrice Heuser, ‘*The Evolution of Nuclear Strategy: About This Book*’, Palgrave Macmillan Online, available at: {<https://www.palgrave.com/gp/book/9781137573490>}.

¹⁰Ward Wilson, ‘Part II: Continuing to question the reliability of nuclear deterrence’, *The Nonproliferation Review*, 19:1 (2012), p. 71.

¹¹Colin S. Gray, *The Implication of Preemptive and Preventive War Doctrines* (Carlisle, PA: Strategic Studies Institute, 2007), p. 29.

¹²Bruno Tertrais, ‘*The Evolution of Nuclear Strategy: About This Book*’, Palgrave Macmillan Online, available at: {<https://www.palgrave.com/gp/book/9781137573490>}.

¹³Jonathan Stevenson, ‘Terrorism and deterrence’, *Survival*, 46:4 (2004), p. 180.

¹⁴*Ibid.*; Paul R. Schratz, ‘Reviewed works: *The Evolution of Nuclear Strategy* by Lawrence Freedman; *The Wizards of Armageddon* by Fred Kaplan; *The Apocalyptic Premise: Nuclear Arms Debated* by Ernest W. Lefever, E. Stephen Hunt’, *Naval War College Review*, 37:3 (1984), p. 98.

¹⁵Other intellectual histories of nuclear strategy and security studies include François Géré, *La Pensée Stratégique Française Contemporaine* (Paris: Éditions Economica, 2017); Fred Kaplan, *The Wizards of Armageddon* (New York, NY: Simon & Schuster, 1983); Jennifer E. Sims, *Icarus Restrained* (Boulder, CO: Westview Press, 1990); Gregg Herken, *Counsels of War* (New York, NY: Knopf, 1985); Colin S. Gray, *Strategic Studies and Public Policy* (Lexington, KY: The University Press of Kentucky, 1982); Raymond Aron, ‘The evolution of modern strategic thought’, *Adelphi Papers*, 9:54 (1969), pp. 1–17; Hedley Bull, ‘Strategic studies and its critics’, *World Politics*, 20:4 (1968), pp. 593–605.

¹⁶Robert Ayson, ‘Strategic studies’, in C. Reus-Smit and D. Snidal, *The Oxford Handbook of International Relations* (Oxford, UK: Oxford University Press, 2008), pp. 558–75; Richard K. Betts, ‘Should strategic studies survive?’, *World Politics*, 50:1 (1997), pp. 7–33; Joshua Rovner, ‘Warring tribes studying war and peace’, *War on the Rocks* (12 April 2017), available at: {<https://warontherocks.com/2016/04/warring-tribes-studying-war-and-peace/>}.

¹⁷According to Google Scholar statistics, *The Evolution* ranks as one of the most widely cited works of nuclear security studies, eclipsing other field-defining contributions such as the Waltz–Sagan proliferation debate, Fred Kaplan’s *Wizards of Armageddon*, and Robert Jervis’s *The Meaning of the Nuclear Revolution*. The legacy of Lawrence Freedman’s writings

Evolution's raison d'être is not first and foremost to theorise or prescribe, but rather to provide a historical representation of dominant nuclear thought. By implication, the book and its authors have helped cast the canon of thinkers, problems, and debates that constitute the field. As such, *The Evolution* is simultaneously a survey of nuclear 'classics' and a 'classic' in its own right, directly and indirectly helping to shape strategic discourse and, by extension, the trajectory and boundaries of the future.¹⁸ In fact, within security studies, *The Evolution* is frequently presented (and, presumably, taught) as something far broader than a study of nuclear strategising narrowly conceived – broader, perhaps, than what the author(s) intended. As presented by leading observers, *The Evolution* is a 'canonical text on nuclear weapons',¹⁹ a 'history of theories and policies concerning nuclear weapons',²⁰ a 'survey of security studies',²¹ and an 'intellectual history of the Cold War'.²²

Using *The Evolution* as a looking glass, we investigate and question the substantive and methodological assumptions that guide both the field generally and Lawrence Freedman and Jeffrey Michaels' volume specifically. The article proceeds in four steps. First, we review and contrast the new edition with its predecessors. Second, turning to epistemology, we maintain that both *The Evolution* and field of nuclear security studies more broadly remain wedded, by and large, to an interpretive approach that conceives the 'classic texts' of nuclear strategy as impartial contributions to a search for universal insight, often abstracting interventions and arguments from their economic, cultural, and political circumstances. This approach, we maintain, is useful for inspecting the locutionary dimension of strategic debates, but risks obscuring the power structures, vested interests, and illocutionary forces shaping the evolution of nuclear strategy. Third, investigating the field's underlying substantive assumptions, we argue that scholars of nuclear security studies have too readily accepted hypotheses about the effects of nuclear threats as self-evident truths or axioms, neglecting alternative accounts and premises. The conclusion suggests avenues for future research, highlighting the importance of a contextualised understanding of nuclear concepts and an embrace of counterfactual analysis.

Nuclear thought and the evolution of *The Evolution of Nuclear Strategy*

The 2019 version of *The Evolution of Nuclear Strategy* is the fourth edition of the book originally produced by Lawrence Freedman at the International Institute for Strategic Studies (IISS) and Royal Institute of International Affairs between 1975 and 1981. The new edition is the first to provide a complete reworking of the original material. Completed with the help of Jeffrey Michaels, a colleague of Freedman's at King's College London and a former NATO and Pentagon official, the fourth edition retells, fills out, and updates the story with events and debates that have taken place since the publication of the third edition in 2003. Scholarship on nuclear politics and strategy has flourished in the period, giving the authors much to work with.²³ Like its predecessors, the fourth edition succinctly rehearses the debates and theories that have shaped nuclear policymaking in the United States and other nuclear-armed nations. While the book is still primarily concerned with American strategists and arguments – something

for policymakers and academics has been acknowledged in the recent collection edited by Benedict Wilkinson and James Gow, *The Art of Creating Power: Freedman on Strategy* (London, UK: Hurst, 2017).

¹⁸See Jenny Andersson, *The Future of the World* (Oxford, UK: Oxford University Press, 2018).

¹⁹Mara Karlin, 'The art of creating power' (Review), *Foreign Affairs*, 97:5 (2018), p. 236.

²⁰Robert Jervis, 'The evolution of nuclear strategy' (Review), *Political Science Quarterly*, 97:3 (1982), p. 518.

²¹Stephen Walt, 'The renaissance of security studies', *International Studies Quarterly*, 35:2 (1991), p. 212.

²²Jonathan Stevenson, 'Terrorism and deterrence', *Survival*, 46:4 (2004), p. 180.

²³For a review of much of this literature, see Elizabeth N. Saunders, 'The domestic politics of nuclear choices: A review essay', *International Security*, 44:2 (2019), pp. 146–84; Erik Gartzke and Matthew Kroening, 'Nukes with numbers: Empirical research on the consequences of nuclear weapons for international conflict', *Annual Review of Political Science*, 19 (2016), pp. 397–412.

the authors readily concede – Freedman and Michaels have expanded the coverage of developments in other countries. For example, the new edition includes a welcome, if brief, discussion of the Swiss and Swedish debates about potential nuclear acquisition in the 1950s and 1960s. In both cases, the moral, political, and security costs of nuclear armament were ultimately seen to outweigh any military utility or prestige value. While the authors define ‘nuclear strategy’ in the purest sense as attempts to extract ‘political benefits from nuclear weapons’, it is important, they argue, to review ‘the whole range of approaches to the nuclear issue’.²⁴ The new edition also includes a more detailed discussion of the nuclearisation of South Asia, examining the key players’ interests and strategic rationales. It also delves deeper into the history of South Africa’s relatively short-lived nuclear-weapon programme, examining the decision to build the bomb and the subsequent choice to dismantle it. And although the analysis might have been further enriched by engagement with Russian-language sources, the authors offer a perceptive and expanded look at Soviet strategy, particularly in the 1950s and 1960s. Freedman and Michaels ably recapture how Soviet strategists, much like their peers in Washington and other NATO capitals, became consumed by the prospect of a bolt-from-the-blue surprise attack that, it appears, was never seriously contemplated by either of them.²⁵

Comprehensively detailing US Secretary of Defense Robert McNamara’s pivot from a strategy centred on the deliberate targeting of civilians to a brief adherence to a ‘no-cities’ doctrine and finally an explicit commitment to societal ‘mutual assured destruction’ (MAD), Freedman and Michaels show how policymakers wrestled with the counsel they were given by the military and their civilian advisors. One of the most insightful points in the book comes out of a discussion of the debate in the United States over the utility or disutility of defence. In the 1960s, the increasingly popular view was that efforts to reduce one’s own vulnerability would merely invite the adversary to engage in offensive arms racing and brinksmanship.²⁶ In other words, the concept of MAD lent itself to the argument that further development of, and spending on, nuclear defence arrangements would be either unnecessary or detrimental to security. Naturally, this argument was popular among those opposed to the nuclear arms race more broadly. And thus, as Freedman and Michaels observe, the legitimisation of a balance of terror, a mutual exchange of existential vulnerability, became a liberal cause.²⁷ While mainstream American security studies now frames deterrence as the obvious and analytically superior solution, Jeffrey Knopf argues that deterrence actually emerged as a ‘centrist compromise’ between disarmers and nuclear war strategists.²⁸

The last four chapters are almost entirely new, surveying conflict dynamics and the prospect of proliferation in the Middle East and Asia. While the authors concede that ‘the possibility of successful nuclear terrorism was very low’,²⁹ they devote an entire chapter to ‘The Nuclear War on Terror’. The chapter outlines the 1990–1 Gulf War, 9/11, and the invasion of Iraq, but does not fully articulate how the three events link together or, for that matter, to nuclear strategy. Readers might have benefited from a discussion of how the security interests involved were constructed, how threats of ‘proliferation’ and ‘rogue actors’ were exploited by interventionists, and how the campaigns in the Middle East have affected the making of the United States as a nuclear-armed counterterrorist state.³⁰

²⁴Lawrence Freedman and Jeffrey Michaels, *The Evolution of Nuclear Strategy* (4th edn, London, UK: Palgrave Macmillan, 2019), pp. x, vi.

²⁵See Richard Ned Lebow, ‘Deterrence: Then and now’, *Journal of Strategic Studies*, 28:5 (2005), p. 769.

²⁶Freedman and Michaels, *The Evolution*, p. 382.

²⁷*ibid.*, p. 452.

²⁸Jeffrey Knopf, ‘Three items in one: Deterrence as a concept, research program and a political issue’, in T. V. Paul, Patrick Morgan, and James Wirtz (eds), *Complex Deterrence: Strategy in the Global Age* (Chicago, IL: University of Chicago Press, 2009), pp. 31–57 (p. 44).

²⁹Freedman and Michaels, *The Evolution*, p. 632.

³⁰Joseph Masco, *The Theater of Operations* (Durham, NC: Duke University Press, 2014); Lisa Stampnitzky, *Disciplining Terror* (Cambridge, UK: Cambridge University Press, 2013).

The 2019 edition expands on the previous versions' engagement with the politics of disarmament, highlighting the waxing and waning of popular and civil society mobilisation for abolition. Ultimately, the book shows how the justifications for various weapon programmes and deployment practices have become entrenched, rigid even after the disappearance of the security threats that were used to justify them in the first place. After 2010, the authors note, the disarmament movement became more vocal, and 122 non-nuclear-weapon states adopted in July 2017 the UN Treaty on the Prohibition of Nuclear Weapons. But disarmament has so far failed to gain significant traction in the nuclear-armed states. Although the United States, Russia, France, and the United Kingdom have reduced the sheer number of nuclear warheads in their possession, they remain committed to nuclear deterrence and have all, along with the other nuclear powers, embarked on long-term programmes to rebuild their capabilities. The final chapter before the conclusion offers an enlightening discussion of the dynamics of nuclear modernisation. Narrowing down on the actions of the Obama administration, the authors describe how, as so often before, politics trumped strategy. To get New START through the US Senate, Obama agreed to the near wholesale rebuilding of the American nuclear arsenal, a multi-decade nuclear 'modernisation' project. Between 2021 and 2030, the United States is set to spend \$634 billion on its nuclear forces.³¹ For scale, the Biden administration's so-called green transition plan for the next eight years allocated a total of \$254 billion – less than half of the nuclear budget – to passenger rail and the electric vehicle sector combined.³²

Overall, the new edition provides subtle but consequential changes to the original story. Certain passages of the new edition come across as less confident about the value and manageability of nuclear deterrence than its predecessors. The new edition does not include the previous assertions that the Cuban Missile Crisis was 'successfully managed' or that nuclear weapons 'provide those who possess them with an ultimate guarantee of security against external aggression and thus, in principle, the possibility of protecting the most vital interests in the most hostile environments'.³³ The disarmament schemes promoted by US President Ronald Reagan are no longer described as 'utopian',³⁴ and the authors acknowledge that a number of close calls during the Cold War were survived 'as much by good luck as by good management'.³⁵

At the same time, an instrumentalist view of the controllability of technology and a general faith in the basic tenets of rational deterrence theory shines through in multiple passages. The authors expressly assert that nuclear weapons have deterred major wars and held alliances together, and the new edition is if anything more generous than previous versions in its praise for the thought-leaders of the first few decades of the American nuclear enterprise; the strategists of the 'golden age' in the 1950s and 1960s were 'giants', 'pioneers', 'visionaries', and 'wizards'.³⁶

The authors also uphold the statement that the political circumstances of the post-Cold War period rendered a breakdown of deterrence 'extremely unlikely'.³⁷ On the first page of the preface, the authors exult that nuclear war 'has been avoided' and that the fourth edition 'can tell a continuing story of non-use'.³⁸ Beyond scattered references to close calls, the authors provide no wider reflection on the role of luck in the non-occurrence of unwanted nuclear explosions or what, if anything, the long history of close calls and the sociology of 'normal accidents' might

³¹Congressional Budget Office, 'Projected Costs of U.S. Nuclear Forces, 2021 to 2031' (May 2021), available at: <https://www.cbo.gov/publication57240>).

³²Adam Tooze, 'America's race to net zero', *New Statesman* (21 April 2021), available at: <https://www.newstatesman.com/world/north-america/2021/04/america-s-race-net-zero>).

³³Lawrence Freedman, *The Evolution of Nuclear Strategy* (3rd edn, Basingstoke, UK: Palgrave Macmillan, 2003), p. xiv.

³⁴Freedman, *The Evolution*, 3rd edn, pp. 195, 406.

³⁵Freedman and Michaels, *The Evolution*, p. 557.

³⁶*Ibid.*, pp. 666, 672.

³⁷*Ibid.*, p. 672.

³⁸*Ibid.*, p. v.

mean for the study and practice of nuclear strategy and security.³⁹ That said, *The Evolution* is first and foremost an intellectual history of the field and not an independent contribution to nuclear strategising. Thus, to the extent that *The Evolution* can be criticised for lacking a serious treatment of chance and contingency, the fault lies primarily with the wider field of nuclear strategic studies and not with its historians. According to one critic, nuclear experts have too readily embraced a view of history that retrospectively neglects the role of contingency and luck.⁴⁰ 'If the Cuban missile crisis had led to war', argues another, 'historians would have constructed a causal chain leading ineluctably to this outcome.'⁴¹

The new edition, like the previous versions, concludes with a humble reflection on the field. Asking whether 'nuclear strategy' might be a contradiction in terms, the authors recall that earlier versions of the book suggested that this was indeed the case: 'Certainly those constructing nuclear strategies had struggled to devise operational uses of nuclear weapons that could meet any worthwhile political objectives.' 'Stability', they argue, has depended on something that was 'more the antithesis of strategy than its apotheosis', to wit, on threats that things might get out of hand and that humans might act irrationally.⁴² To this it might be added that the condition of nuclear stability and absence of major power war has been maintained, in part, by good fortune – as Freedman and Michaels acknowledge elsewhere. At any rate, the authors maintain the critique that 'nuclear strategy' might be oxymoronic, casting doubt on the field's very *raison d'être*. But they also uphold the corrective, added between the second (1989) and third (2003) editions, that, with the benefit of hindsight, 'the earlier conclusion that the practice [of nuclear strategy] was in some way non-strategic now seems mistaken'.⁴³ It is unclear what happened between 1989 and 2003 to so dramatically alter the conclusion, but the practice of nuclear strategy, the authors maintain, was in line with the approach of the 'classical' strategists:

The practice was quite compatible with the approach of those described by Michael Howard, in one of the first surveys of the impact of nuclear weapons on strategic thought, as the classical strategists, that is 'the thinkers who assume that the element of force exists in international relations, that it can and must be intelligently controlled, but that it cannot be totally eliminated'.⁴⁴

This conclusion is unlikely to leave those looking for clear answers satisfied. Is nuclear strategy oxymoronic or not? Is nuclear armament advisable, and, if yes, how much is enough? And would not virtually all students of IR accept that the 'element of force' exists and must be controlled, but that it cannot be totally eliminated? The authors do not provide explicit answers to these fundamental questions, opting instead to highlight the uncertainties of knowledge and the paradoxical nature of nuclear statecraft. On the one hand, the openness of the conclusion is refreshing; the nuclear expert community's track record with respect to truth claims and prediction is at best questionable.⁴⁵ On the other hand, the authors could arguably have distinguished more clearly between what we know, what we think we know, what we don't know, and what we cannot know.

³⁹See Charles Perrow, *Normal Accidents: Living with High Risk Technologies* (Princeton, NJ: Princeton University Press, 1984).

⁴⁰Benoît Pelopidas, 'The unbearable lightness of luck', *European Journal of International Security*, 2:2 (2017), p. 252.

⁴¹Richard Ned Lebow, 'Counterfactuals and security studies', *Security Studies*, 24:3 (2015), p. 406.

⁴²Freedman and Michaels, *The Evolution*, p. 665.

⁴³*Ibid.*, p. 666.

⁴⁴*Ibid.*

⁴⁵Bruce Kuklick, *Blind Oracles: Intellectuals and War from Kennan to Kissinger* (Princeton, NJ: Princeton University Press, 2006); Benoît Pelopidas, 'The oracles of proliferation', *The Nonproliferation Review*, 18:1 (2011), pp. 297–314; William M. Arkin, 'The sky-is-still-falling profession', *Bulletin of the Atomic Scientists*, 50:2 (1994), p. 64.

The history of nuclear thought as intellectual history

Expressly assuming the role of the historian of ideas, the authors of *The Evolution* set out to offer a 'systematic and reasonably comprehensive treatment of the major themes of nuclear strategy'.⁴⁶ In so doing, the authors aim to provide 'a study of how [a] body of thought took shape'.⁴⁷ Yet, other than some discussion of policy impact and the importance of studying the 'big books and ideas',⁴⁸ the authors do not explain their case/text-selection criteria or epistemology or method more generally. This would appear to run counter to the general trend in intellectual history, which has grown increasingly attuned to methodology in recent decades, highly sensitive to questions of context, intention, and the influence of material forces on the production of ideas. Indeed, it is crucial 'to keep the strategic debates in context', Freedman and Michaels posit.⁴⁹ However, beyond providing eloquent summaries of wider events in the world of nuclear weapons, the authors largely abstain from considering economic, political, and ideological contexts shaping the field. With some exceptions, they also typically refrain from attempts at reconstructing authors' preconceptions, likely motives, and influences.

According to David Runciman, a 'great methodological argument' in the history of political thought began in the late 1960s when Quentin Skinner and others began attacking the notion that the task of the historian of ideas was to uncover the 'dateless wisdom' contained in a pre-determined canon of classic texts.⁵⁰ The 'classic texts' should not be abstracted from their respective contexts, proponents of the 'Cambridge School' postulated, but instead approached as discursively bounded and inescapably political speech acts. For Skinner, intellectual historians should approach Hobbes's *Leviathan* in the same way they would approach a speech in parliament. Intellectual historians should therefore analyse not only what texts *say*, but also what their authors *did* by writing them.⁵¹ As argued by J. L. Austin and other theorists of language, speech acts should be analysed from at least three angles: their straightforward content (locution), their purpose (illocution), and their consequences (perlocution).⁵²

Certainly, the Cambridge School has since been subjected to a number of criticisms. In particular, several scholars have argued that the Cambridge School's emphasis on authors' intentions as the primary context to be investigated ignores the fact that authors may be influenced by a whole range of contexts that are unconscious to them, including aesthetic norms, conflicts of interest, and ideology.⁵³ Furthermore, it may be that the economic or social structures of particular societies function to filter out certain perspectives while amplifying others, thus skewing the marketplace of ideas. Yet, the effect of this critique was not to undermine the Cambridge School's basic appeal to investigate the illocutionary dimension and wider context, but instead to strengthen it.⁵⁴ The Cambridge School's main analytical competitor is thus no longer the 'idealist' orthodoxy against which it was originally pitted, but the position that that context(s) should be further unpacked and investigated.⁵⁵ Along these lines, Stephen Walt argued

⁴⁶Freedman and Michaels, *The Evolution*, p. xii.

⁴⁷Marc Trachtenberg, *History and Strategy* (Princeton, NJ: Princeton University Press, 1991), p. ix.

⁴⁸Freedman and Michaels, *The Evolution*, p. vi.

⁴⁹*Ibid.*

⁵⁰David Runciman, 'History of political thought: The state of the discipline', *British Journal of Politics and International Relations*, 3:1 (2001), pp. 84–104 (p. 84).

⁵¹Quentin Skinner, 'Meaning and understanding in the history of ideas', *History and Theory*, 8:1 (1969), pp. 3–53.

⁵²J. L. Austin, *How to Do Things with Words* (Cambridge, MA: Harvard University Press, 1975 [orig. pub. 1962]), pp. 94–104.

⁵³Dominick Lacapra, 'Rethinking intellectual history and reading texts', *History and Theory*, 19:3 (1980), pp. 245–76.

⁵⁴David Runciman, 'History of political thought: The state of the discipline', *British Journal of Politics and International Relations*, 3:1 (2001), p. 84; Samuel Moyn, 'Imaginary intellectual history', in Darrin M. McMahon and Samuel Moyn (eds), *Rethinking Modern European Intellectual History* (Oxford, UK: Oxford University Press, 2014), pp. 112–30.

⁵⁵See, for example, William Bosworth and Keith Dowding, 'The Cambridge School and Kripke: Bug detecting with the history of political thought', *The Review of Politics*, 81:4 (2019), pp. 621–42; Michelle T. Clarke, 'The mythologies of contextualism', *Political Studies*, 61:4 (2013), pp. 767–83; Dominick Lacapra, 'Rethinking intellectual history and reading texts', *History and Theory*, 19:3 (1980), pp. 245–76.

already in a 1987 review essay on strategic literature that ‘those with the greatest stake in strategic issues’ – the professional military, arms contractors, and defence think tanks – ‘are also those with the greatest ability to shape the debate’.⁵⁶ Accordingly, historians of strategy should reject the assumption of an unbiased marketplace of ideas and instead take pains to identify the power structures and material forces shaping the national security debate.

It should be stressed that Freedman and Michaels’ relative inattention to the intellectual and material contexts that shaped the texts under discussion is far from unique to *The Evolution of Nuclear Strategy*.⁵⁷ Students of strategy almost invariably take the teleological approach of reading strategic texts as impartial anticipations of, or contributions to, an underlying grand doctrine or science.⁵⁸ To their credit, the authors of *The Evolution* acknowledge that if there is an underlying trend in nuclear strategic thinking it may be ‘less towards the refinement of a theory’ and more ‘towards a steady resistance to the idea of an operational nuclear strategy’.⁵⁹ Yet in certain central passages they frame particular interventions either as anticipations of future intellectual developments or as having ‘explained’, ‘identified’, or ‘recognised’ underlying truths or axioms.⁶⁰ For example, the authors suggest that, by the mid-1950s, Chinese experts were ‘beginning to recognise’ the ‘importance of the American nuclear force as an explanation for the caution in Soviet foreign policy’.⁶¹ The cautionary effect of (American) nuclear weapons is thus asserted as a fact – a natural law to be discovered by attentive strategists. Yet, as discussed below, there is an ongoing debate about the effectiveness of nuclear threats as instruments of creating stability. Several scholars have argued that nuclear weapons may often serve to increase tensions rather than the other way around.⁶²

Sensibly, the authors often question the assumptions and illocutionary intentions of those involved in the direct practice of nuclear statecraft; interventions by active government officials and military practitioners are occasionally framed as PR exercises, attempts at signalling to adversaries, or exercises in influencing public opinion at home or overseas.⁶³ Freedman and Michaels argue, for example, that Soviet officials saw propaganda potential in warnings about accidental war and the possibility that American aircraft could have accidents over friendly territory.⁶⁴ Peace research institutes, they note, had ‘close links with the anti-nuclear movement’.⁶⁵ But most often the authors’ analysis is limited to strategic texts’ locutionary dimension, that is, to the substantive content of the ‘big books and ideas’ of nuclear strategic studies. Civilian think tank strategists are routinely presented as apolitical, disinterested academics, whose arguments constitute free-flowing ‘unit ideas’ circulating in an unbiased

⁵⁶Stephen M. Walt, ‘The search for a science of strategy: A review essay’, *International Security*, 12:1 (1987), pp. 140–65 (p. 157).

⁵⁷The same appears to apply to, for example, Jan Hanska, ‘Rethinking the unthinkable: Revisiting theories of nuclear deterrence and escalation’, *Journal of Military Studies*, 9:1 (2020), pp. 49–60; Patrick M. Cronin, ‘Introduction’, in *The Evolution of Strategic Thought: Classic Adelphi Papers* (London, UK: Routledge, 2008), pp. 1–30; Sims, *Icarus Restrained*; Gray, *Strategic Studies and Public Policy*; Aron, ‘The evolution of modern strategic thought’; Bull, ‘Strategic studies and its critics’. Scholarship on nuclear strategy has only rarely appeared in specialised intellectual history journals. Recent exceptions include Joel Isaac, ‘Strategy as intellectual history’, *Modern Intellectual History*, 16:3 (2019), pp. 1007–21; Wilson, ‘Keynes goes nuclear’. See also Peter Paret, Gordon A. Craig, and Felix Gilbert (eds), *Makers of Modern Strategy: From Machiavelli to the Nuclear Age* (Princeton, NJ: Princeton University Press, 1986).

⁵⁸See Stephen M. Walt, ‘The search for a science of strategy’, *International Security*, 12:1 (1987), pp. 140–65.

⁵⁹Freedman and Michaels, *The Evolution*, p. xi.

⁶⁰*Ibid.*, pp. 63, 73, 232–3, 287, 299, 605.

⁶¹*Ibid.*, p. 393.

⁶²Richard Ned Lebow and Janice G. Stein, *We All Lost the Cold War* (Princeton, NJ: Princeton University Press, 1994), ch. 2; David Holloway, ‘Nuclear weapons and the escalation of the Cold War, 1945–1962’, in M. P. Leffler and O. A. Westad (eds), *The Cambridge History of the Cold War*, Vol. 1 (Cambridge, UK: Cambridge University Press, 2010), pp. 376–7.

⁶³Freedman and Michaels, *The Evolution*, p. 107.

⁶⁴*Ibid.*, p. 240.

⁶⁵*Ibid.*, p. 505.

marketplace of strategic ideas.⁶⁶ This is a missed opportunity – or at any rate something that might be investigated more attentively in the future – for two reasons.

First, abstracting ideas and interventions from the context of their occurrence limits intellectual history to a question of what writers were *saying*, preventing us from asking the equally important question of what they were *doing*.⁶⁷ This cuts off the reader from an important means of understanding.⁶⁸ For example, in their discussion of the spectacular and supposed war-winning quality of atomic weapons, the authors place considerable evidentiary burden on public interventions made by former US Secretary of War Henry Stimson after the War. As the authors report, in 1948 Stimson argued that the bombings were justified and effective; the bomb ‘was more than a weapon of terrible destruction; it was a psychological weapon’.⁶⁹ A year before, he submitted that his support for the atomic bombing of Japan had been informed by his belief that the extraction of a ‘genuine surrender’ from the Japanese emperor and his advisers would require subjecting them to ‘a tremendous shock’.⁷⁰ But can these post hoc utterances really be taken as objective descriptions of fact? Already in 1993, the historian Barton Bernstein professed that Stimson’s postwar interventions should be read not as detached, objective accounts of the atomic bombings, but as the justifications of a policymaker with an obvious interest in protecting his and his colleagues’ legacies. The months and years following August 1945 had seen considerable criticism of the Truman administration’s decision to drop the atomic bombs.⁷¹ Stimson’s interventions, Bernstein documents, were part of a broader effort by key members of the American nuclear establishment to discourage further criticism and ‘the wrong kind of thinking’.⁷² Reconstructing and reflecting upon authorial intentions and the broader discursive context might have enabled the authors to deepen their analysis and shed light not only on the substance of what was said but also on why it was said and to what effect. Few ideas in strategic studies have been as influential as the idea that nuclear weapons are war-winning instruments. Understanding its origins is of crucial academic and political importance.⁷³

A similar missed opportunity appears in a passage on the management of the Cuban Missile Crisis. Of course, the Missile Crisis is of great historical import, as few historical events have had greater impact on nuclear policy, security studies, and the position of nuclear weapons in popular culture. Freedman and Michaels correctly point out that transcripts of the high-level meetings that took place in the United States during the Crisis tell a story of concern and anxiety that things were getting out of hand. However, in an apparent attempt at creating balance, they relay general Maxwell Taylor’s assertion – offered two decades after the crisis – that ‘I never heard an expression of fear of nuclear escalation on the part of any of my colleagues. If at any time we were sitting on the edge of Armageddon, as nonparticipants [in the crisis] have sometimes alleged, we were too unobservant to notice it.’⁷⁴ What Taylor is saying seems relatively straightforward, albeit in contradiction with the official meeting records and several other

⁶⁶See Quentin Skinner, *Visions of Politics. Volume 1: Regarding Method* (Cambridge, UK: Cambridge University Press, 2002), pp. 101–04.

⁶⁷See Francis J. Gavin, ‘Rethinking the bomb: Nuclear weapons and American grand strategy’, *Texas National Security Review*, 2:1 (2018), p. 89.

⁶⁸See Skinner, *Visions of Politics*, p. 86.

⁶⁹Freedman and Michaels, *The Evolution*, p. 25.

⁷⁰*Ibid.*, p. 24.

⁷¹See, for example, Lawrence S. Wittner, *The Struggle Against the Bomb*, Vol. 1 (Stanford, CA: Stanford University Press, 1993), pp. 56–8.

⁷²Barton J. Bernstein, ‘Seizing the contested terrain of early nuclear history’, *Diplomatic History*, 17:1 (1993), p. 36. McGeorge Bundy, who co-authored Stimson’s 1948 memoir and was also the uncredited co-author of the 1947 *Harper’s Magazine* essay, would later acknowledge that they had claimed ‘too much’ and that the interventions were shaped by Stimson’s ‘fervor [as] a great advocate’. See Bernstein, ‘Seizing the contested terrain of early nuclear history’, pp. 37, 72.

⁷³For a discussion of those origins, see, for example, Gregg Herken, *The Winning Weapon: The Atomic Bomb in the Cold War, 1945–1950* (Princeton, NJ: Princeton University Press, 1982).

⁷⁴Freedman and Michaels, *The Evolution*, p. 275.

participants' memoirs and accounts.⁷⁵ But what exactly was he *doing*? Answering the latter question would invite us to consider, for example, that Talyor was a self-styled 'hawk' who had recommended air strikes against Soviet targets in Cuba and had spent his career arguing that US forces 'could survive, fight, and win on a nuclear battlefield'.⁷⁶ One might also have considered that the world's largest-ever protest rally had taken place just months before – close to a million people had congregated in New York City's Central Park to remonstrate the nuclear arms race – and that the retired general's claim would be (and was) read as a response to those promoting arms control and disarmament on the grounds that human passions were incompatible with the effective control of nuclear weapons over the long term.⁷⁷

Second, abstracting arguments from the precise circumstances of their occurrence can make it more difficult to understand how and why particular discourses appeared, spread, and prevailed over others. For example, in their discussion of the shift 'from disarmament to arms control' in the late 1950s and early 1960s, Freedman and Michaels draw attention to the 1960/1961 publication of a collection of essays that 'became known as the "bible" of arms control'.⁷⁸ Quoting IISS director Alastair Buchan, the authors posit that the overall effect of the collection was 'to confirm "the growing consensus of opinion in the United States that limited arms control offers a more fruitful prospect than do schemes of comprehensive disarmament"'.⁷⁹ The collection in question was undoubtedly influential, and there is no doubt that the late 1950s and early 1960s saw the rise to prominence of the arms control paradigm. A crucial question for those seeking to understand how nuclear strategy took shape, however, is *how* this shift transpired. The 'bible', the authors note, comprised papers by 'the leading figures working on military strategy and nuclear technology, including Kahn, Kissinger and Schelling', and came about as a result of Harvard-MIT faculty seminars and discussions organised by the American Academy of Arts and Sciences. But how and why did these 'leading figures' come to be seen as leading figures? How was the activity funded? How did the arms controllers gain such political influence? And did this ostensible 'consensus' really constitute a consensus?

It is clear, for example, that the supposed arms control consensus did not encompass prominent nuclear and classical 'realists' such as Hans Morgenthau, Günther Anders, John Herz, Lewis Mumford, and Bertrand Russell.⁸⁰ It is also clear that the field of security studies, not least nuclear strategy, has been profoundly influenced by the provision of handsome donations and research grants by the defence industry, nuclear-armed governments, and conservative foundations.⁸¹ The evolution of strategic discourse, in this view, cannot simply be understood as an endogenous development through which the best arguments eventually won out, but must instead be

⁷⁵As documented by Stern, virtually all participants in the Crisis have offered inconsistent and self-serving accounts of the Crisis. Sheldon M. Stern, *The Cuban Missile Crisis in American Memory* (Stanford, CA: Stanford University Press, 2012).

⁷⁶Gregory Daddis and Jesse A. Faugstad, 'Hope as a method', *War on the Rocks* (23 May 2019), available at: {<https://warontherocks.com/2019/05/hope-as-a-method-maxwell-taylor-and-americas-cold-war/>}.

⁷⁷See, for example, Chalmers M. Roberts, 'A smell of burning in the air', *Washington Post* (18 October 1982); Edward M. Kennedy and Mark O. Hatfield, *Freeze! How You Can Help Prevent Nuclear War* (New York, NY: Bantam Books, 1982).

⁷⁸Freedman and Michaels, *The Evolution*, p. 249.

⁷⁹*Ibid.*, pp. 249–50.

⁸⁰See Daniel Deudney, *Bounding Power: Republican Security Theory from the Polis to the Global Village* (Princeton, NJ: Princeton University Press, 2007), pp. 248–52; Campbell Craig, *Glimmer of a New Leviathan* (New York, NY: Columbia University Press, 2003), ch. 5; Rens van Munster and Casper Sylvest, *Nuclear Realism: Global Political thought During the Thermonuclear Revolution* (London, UK: Routledge, 2016); Carina Meyn, 'Realism for nuclear-policy wonks', *The Nonproliferation Review*, 25:1–2 (2018), pp. 111–28.

⁸¹S. M. Amadae, *Rationalizing Capitalist Democracy: The Cold War Origins of Rational Choice Liberalism* (Chicago, IL: The University of Chicago Press, 2003), ch. 1; Barry Buzan and Lene Hansen, *The Evolution of International Security Studies* (Cambridge, UK: Cambridge University Press, 2009), pp. 60–6; Richard D. Lambert, 'DoD, social science, and international studies', *AAAPSS*, 502:1 (1989), pp. 94–107; Barry Smart, 'Military-industrial complexities, university research and neoliberal economy', *Journal of Sociology*, 52:3 (2016), pp. 455–81; Ole Wæver, 'The history and social structure of security studies as a practice-academic field', in Trine V. Berling and Christian Bueger (eds), *Security Expertise: Practice, Power, Responsibility* (London, UK: Routledge, 2015), pp. 76–106.

conceived as an intensely contested process in which rival groups vie for intellectual hegemony, political influence, and funding, and in which the question of who has ‘won’ a debate is determined, in part, by powerful interest groups and governments. We may be dealing not with a marketplace of ideas but rather a marketplace of justifications.⁸² This is not to say that all or most participants in strategic debates are dishonest or do not produce sound analysis, but rather that their readers will inevitably be influenced by confirmation bias, and that cultural, political, and economic forces serve to elevate some authors and perspectives while marginalising others.⁸³ To understand how the dominant nuclear strategic discourse took shape and evolved, we must study not only the content of influential texts, but also the social, economic, and political conditions that enabled their publication and dissemination.⁸⁴

Any book is based on a trade-off between breadth and depth, and it is not ipso facto wrong to privilege the former over the latter. Indeed, one of *The Evolution*’s great strengths is its fluent, ‘bird’s-eye’ inspection of longer trends. Our argument here is not that the authors should have sacrificed breadth for depth, but rather that the vital question of how and why particular discourses ‘won’ in the marketplace of ideas deserves further analysis. For example, the authors present the RAND Corporation – perhaps the most central actor in their story – simply as an ‘independent non-profit corporation’, leaving out its links to the Kennedy and Johnson administrations, connections to the Ford Foundation and Douglas Aircraft Company, and symbiotic relationship with, and enduring financial reliance on, the US Air Force, probably the service branch with the most favourable view of nuclear weapons.⁸⁵

Short of including in the book a comprehensive discussion of funding arrangements and the entanglement of strategic studies with the security state, the authors might have added an extra sprinkling of bibliographical data. In some cases, just a few pieces of vulgar information would have given readers immediate access to an additional layer of understanding. For example, when approaching Pierre Gallois’ contention that US extended nuclear deterrence lacked credibility and that France accordingly ought to acquire its own nuclear arsenal and thereby allow NATO to ‘exploit the greater credibility of national nuclear deterrents’,⁸⁶ the reader might have been interested to know that Gallois was the marketing director of Dassault – the main contractor for the production of the first generation of French nuclear bombers.⁸⁷ Next, when approaching the question of why Gallois’ rhetorical counterpart, Albert Wohlstetter, disagreed and maintained that American nuclear security guarantees were more than credible enough, it seems relevant to note that Wohlstetter, who toed the US government’s line, was an employee of a think tank that derived most of its funds from the coffers of the Pentagon. Lastly, when discussing the ‘icy rationality’ of Herman Kahn’s defence of the possibility of nuclear warfighting in *Thinking About the*

⁸²See Hugo Mercier, *Not Born Yesterday: The Science of Who We Trust and What We Believe* (Princeton, NJ: Princeton University Press, 2020).

⁸³See Christopher Hobson, *The Rise of Democracy: Revolution, War and Transformations in International Politics since 1776* (Edinburgh, UK: Edinburgh University Press, 2015), p. 35; Patrick Morgan, ‘The practice of deterrence’, in Emmanuel Adler and Vincent Pouliot (eds), *International Practices* (Cambridge, UK: Cambridge University Press, 2011), pp. 139–73 (p. 148).

⁸⁴D. F. McKenzie, *Bibliography and the Sociology of Texts* (Cambridge, UK: Cambridge University Press, 2004 [orig. pub. 1987]), p. 13.

⁸⁵David A. Rosenberg, ‘The origins of overkill: Nuclear weapons and American strategy, 1945–1960’, *International Security*, 7:4 (1983), p. 69. See also Amadae, *Rationalizing Capitalist Democracy*, ch. 1. Freedman and Michaels present RAND as the ‘proto-typical’ think tank. It was ‘set up under an Air Force grant’ in the mid-1940s, but ‘soon became an independent non-profit organization’ (p. 218). On p. 168, the authors note that Herman Kahn left RAND in 1961 because it ‘did not suit RAND to challenge Air Force priorities’, but do not provide any further information about why that might be or how the Air Force shaped the discourse.

⁸⁶Freedman and Michaels, *The Evolution*, p. 166.

⁸⁷Gallois joined Dassault Aviation in February 1957. See Christian Malis, *Pierre Marie Gallois: Géopolitique, Histoire, Stratégie* (Lausanne, France: L’Âge d’Homme, 2009), pp. 402–14; Dassault Aviation, ‘Pierre Gallois’, available at: {<https://www.dassault-aviation.com/fr/passion/histoire/hommes/pierre-gallois/>}.

Unthinkable (1962) and, later, *On Escalation* (1965),⁸⁸ the authors might have noted that the production of both books was made possible by funding from the Martin-Marietta Corporation – the then-leading manufacturer of American intercontinental ballistic missiles.⁸⁹ In fairness, as suggested above, Freedman and Michaels are far from alone in bracketing the material conditions in which Kahn and others operated. For example, in her biography of Kahn, Sharon Ghamari-Tabrizi provides but a single oblique reference to the connection between Kahn and Martin-Marietta – the funder of two of Kahn’s three most cited works on nuclear strategy: ‘IBM’s Federal Systems Division, the Martin Company, the MITRE Corporation, and the Stanford Research Institute gave Hudson [the think tank founded by Kahn] its first commissions.’⁹⁰ Again, the issue here is not that Kahn and other strategists were necessarily dishonest or duplicitous, but rather that the publication, dissemination, and promotion of their work owed to the material and political interests of their benefactors.⁹¹

Nuclear weapons as stabilising and war-winning instruments

The majority of publications in nuclear security studies are written on the implicit or explicit assumption that nuclear weapons are effective tools of suasion – that is, that nuclear arms are ‘war winning’ instruments, that nuclear arsenals provide security and coercive power, and that nuclear deterrence, on balance, promotes caution and stability in international affairs.⁹² As much of the field more generally, *The Evolution* takes its point of departure from the supposed ‘axioms’ of the nuclear age, ‘identified’ by the classical strategists during the early Cold War: ‘the impossibility of defence; the hopeless vulnerability of the world’s major cities; the attraction of a sudden attack; and the necessity of a capability for retaliation.’⁹³ For scholars steeped in other analytical traditions, however, these ‘axioms’ look suspiciously like hypotheses. And the propositions in question were perhaps not ‘identified’ as much as ‘invented’ or ‘put forward’ by participants in political debates.

Freedman and Michaels maintain that the historical record ‘suggests – even if it cannot prove – that the risk of nuclear disaster has been the source of a welcome caution in international politics over the past seven decades.’⁹⁴ The stabilising effect of nuclear weapons has been ‘demonstrated’ by studies, Freedman and Michaels claim.⁹⁵ But although the two books provided as sources for this contention make persuasive cases for the claim that the prospect of nuclear war has fostered caution in some or even many instances, they do not prove that this increase in caution has outweighed any increase in antagonism or the risk of rapid nuclear escalation and cataclysmic war. The authors occasionally imply that nuclear deterrence prevented a Soviet attack on the United States or Western Europe – deterrence ‘always depended on a fear of a massive loss of life’⁹⁶ – but do not systematically investigate the available data. While such an eventuality no doubt was possible, there appears to be little evidence in the Soviet

⁸⁸Freedman and Michaels, *The Evolution*, pp. 166, 316.

⁸⁹Herman Kahn, *Thinking about the Unthinkable* (New York, NY: Avon Books, 1962), p. 18.

⁹⁰Sharon Ghamari-Tabrizi, *The Worlds of Herman Kahn: The Intuitive Science of Thermonuclear War* (Cambridge, MA: Harvard University Press, 2005).

⁹¹See Daniel Bessner, ‘What are intellectuals good for?’, *Perspectives on Politics*, 17:4 (2019), p. 1112; Daniel D. Drezner, *The Ideas Industry* (Oxford, UK: Oxford University Press, 2017).

⁹²Freedman and Michaels, *The Evolution*, pp. vii, 9, 19, 319, 393, 670. As suggested, this assumption is present in most nuclear security studies, including, for example, the other major ‘textbook’ on nuclear security and strategy, to wit, Kenneth N. Waltz and Scott D. Sagan’s *The Spread of Nuclear Weapons: A Debate Renewed* (New York, NY: W. W. Norton & Company, 2002). See also Campbell Craig, ‘Testing the organisation of man’, *International Relations*, 26:3 (2012), pp. 291–303.

⁹³Freedman and Michaels, *The Evolution*, p. 63.

⁹⁴*Ibid.*, p. x.

⁹⁵*Ibid.*, p. 670.

⁹⁶Freedman, *The Evolution*, 3rd edn, p. 319.

archives that Moscow would have carried out aggression against Western Europe in the absence of nuclear deterrence practices.⁹⁷ The assumption that nuclear weapons promote caution is maybe not as incontestable as mainstream nuclear security studies might suggest.⁹⁸ As demonstrated by Cuban Missile Crisis and Taiwan Strait Crises, deterrent threats can often lead to anger and escalation rather than restraint and caution.⁹⁹ Of course, the Cold War itself began, in part, as a result of nuclear diplomacy and intensifying suspicion between East and West.¹⁰⁰ In his infamous 'X' article in *Foreign Affairs*, George Kennan, the architect of the US policy of containment, maintained that the Soviets and others suffering from the deceitful Russian or 'oriental mind' simply could not be trusted¹⁰¹ – a concern that only grew in significance following the Soviet Union's development of atomic weapons.¹⁰² As Freedman and Michaels rightly observe, Kennan argued for the need to resist the Soviet Union's 'expansive tendencies'.¹⁰³ However, over the coming decades, Kennan would go on an intellectual journey, which, by the 1970s, had taken him to the position that the Soviets were not expansionist and that reliance on nuclear deterrence was disastrously risky in the long term.¹⁰⁴ It is worth paying attention to the fact that security studies remembers the early Kennan but has largely forgotten about, or never cared to listen to, the later Kennan.¹⁰⁵

The claim that nuclear weapons are war-winning rests heavily on the cases of Hiroshima and Nagasaki. To understand the strategy behind the atomic bombings of Hiroshima and Nagasaki, the authors contend, one must understand 'what US policy-makers thought they were trying to achieve' when they authorised the use of atomic bombs against Japanese cities.¹⁰⁶ They conclude that the aim of the US leadership was to 'shock Japan into submission',¹⁰⁷ and that this strategy, broadly speaking, proved successful. This latter idea is implied already in the book's first paragraph, which describes the consequences of the atomic bombings of Hiroshima and Nagasaki and then segues directly to the Japanese surrender without any mention of Japan's war weariness, the conventional bombing raids, or the Soviet entry into the War against Japan. The authors' apparent conclusion that the atomic bombings were responsible for the end of the War diverges in degree from that of the previous editions, in which it is argued that the lessons that could be drawn from Hiroshima and Nagasaki were limited, and that if the atomic bombings had a role 'it was in accelerating and intensifying the process of political change. But even here caution is due.'¹⁰⁸

⁹⁷According to the historian Vojtech Mastny, nuclear weapons were 'irrelevant to deterring a major war that the enemy did not wish to launch in the first place'. He adds '[a]ll Warsaw Pact scenarios presumed a war started by NATO.' Mastny, 'Imagining war in Europe', in Vojtech Mastny, Andreas Wenger, and Sven Holtmark (eds), *War Plans and Alliances in the Cold War* (London, UK: Routledge, 2006), pp. 15–45 (pp. 3, 27). More recently, Norman Naimark has documented how Stalin, for all his other faults and tendencies, acted as a 'hyper-realist' in Europe, eschewing aggressive strategies against the West. Norman Naimark, *Stalin and the Fate of Europe* (Cambridge, UK: Belknap Press, 2019). See also Lebow, 'Deterrence: Then and now', p. 769.

⁹⁸James Lebovic, *Deadly Dilemmas: Deterrence in US Nuclear Strategy* (New York, NY: Columbia University Press, 1990), p. 193.

⁹⁹Richard Ned Lebow, *A Democratic Foreign Policy* (London, UK: Palgrave Macmillan, 2020), p. 85; Melvin Gurtov and Byung-Moo Hwang, *China under Threat: The Politics of Strategy and Diplomacy* (Baltimore, MD: Johns Hopkins University Press, 1980), pp. 63–98.

¹⁰⁰Holloway, 'Nuclear weapons and the escalation of the cold war, 1945–1962'; Martin McCauley, *Origins of the Cold War, 1941–1949* (Abingdon, UK: Routledge, 2016).

¹⁰¹X (George Kennan), 'The sources of Soviet conduct', *Foreign Affairs*, 25:4 (1946), p. 574.

¹⁰²See Daniel Bessner, *Democracy in Exile* (Ithaca, NY: Cornell University Press, 2018), p. 2.

¹⁰³Freedman and Michaels, *The Evolution*, p. 69.

¹⁰⁴See George Kennan, *Nuclear Delusion* (New York, NY: Pantheon, 1982).

¹⁰⁵See, for example, Barton J. Bernstein, 'Considering John Lewis Gaddis's Kennan biography', *European Journal of Social Science*, 52:1 (2014), pp. 253–75.

¹⁰⁶Freedman and Michaels, *The Evolution*, p. 19.

¹⁰⁷*Ibid.*, p. 17.

¹⁰⁸Freedman, *The Evolution*. 3rd edn, p. 19. The same claim appears in all previous editions.

Later in the book, the authors note the possibility that Japan would have surrendered anyway, either through a diplomatic process or in response to the Soviet invasion that began on 10 August 1945.¹⁰⁹ However, these ideas are not developed with much detail, and the authors dismiss 'revisionist' interpretations of the end of the War in the Pacific for failing to address the motives and strategic thinking of American policymakers. However, the authors arguably oversimplify the so-called revisionist literature by subsuming it with Gar Alperovitz's argument that the nuclear bombings were intended as signals to Stalin. (Stalin, for his part, certainly interpreted it as such.)¹¹⁰ As a consequence, Freedman and Michaels miss out on a wealth of rich historiography on the atomic bombings.¹¹¹ As noted by Michael Gordin, revisionist studies have little in common beyond their questioning of one or more of the traditionalist premises laid out by Stimson and others in second half of the 1940s.¹¹² Freedman and Michaels support their conclusion that the atomic bombings were decisive in the ending of the war with a number of texts published by US government officials, military personnel, and participants in the Manhattan project after the end of the war. However, as suggested above, these voices cannot readily be used as straightforward expressions of fact but must instead be treated as subjective interpretations or attempts at influencing public opinion or the hegemonic historical account.

While the volume cites many of those who believed the bombings were or would be decisive, it does not provide the same space for historians or policymakers of the opposite opinion, including Truman's chief of staff, fleet admiral Leahy, top generals such as LeMay and Eisenhower, or other members of the Joint Chiefs of Staff.¹¹³ Moreover, the authors do not seriously consider the effect on the Japanese emperor's decision to surrender of the Soviet entry into the war. The authors note that, in his broadcast to the nation on 14 August 1945, Hirohito 'mentioned atom bombs but not the Soviet invasion',¹¹⁴ yet do not attempt to reconstruct the emperor's illocutionary intentions or the political struggles within the Japanese leadership over how and when to surrender. For those in favour of ending the war as quickly as possible, the introduction by the Americans of a new and sinister super weapon offered a perfect justification – or excuse – to end the war.¹¹⁵ According to John Dower, the purpose of the emperor's broadcast was precisely to spin Japan's failures in the war by presenting the capitulation as 'nothing less than a magnanimous act that might save humanity itself from annihilation by an atrocious adversary'.¹¹⁶ For Tsuyoshi Hasegawa, arguably the greatest authority on the Japanese sources, in the absence of the Soviet invasion, the two atomic bombs would 'most likely not have prompted the Japanese to surrender, so long as they still had hope that Moscow would mediate'.¹¹⁷ Accordingly, the authors' renewed confidence in the 'strategy of Hiroshima' appears somewhat at odds with recent

¹⁰⁹Freedman and Michaels, *The Evolution*, p. 31.

¹¹⁰Holloway, 'Nuclear weapons and the escalation of the Cold War, 1945–1962', p. 377.

¹¹¹Samuel J. Walker, 'Recent literature on Truman's atomic bomb decision', in Frank Costigliola and Michael J. Hogan (eds), *America and the World: The Historiography of American Foreign Relations since 1941* (Cambridge, UK: Cambridge University Press, 2014), pp. 83–104. See also Sean L. Malloy, 'Harry S. Truman and the decision to use the atomic bomb', in Daniel S. Margolies (ed.), *A Companion to Harry Truman* (Oxford, UK: Wiley-Blackwell, 2012), p. 76.

¹¹²Michael D. Gordin, *Five Days in August: How World War II Became a Nuclear War* (Princeton, NJ: Princeton University Press, 2015), pp. 142–3.

¹¹³Samuel J. Walker, *Prompt and Utter Destruction, Truman and the Use of Atomic Bombs Against Japan* (Chapel Hill, NC: University of North Carolina Press, 2016 [orig. pub. 1997]), p. 90; Gar Alperovitz, *The Decision to Use the Atomic Bomb: The Architecture of an American Myth* (New York, NY: Vintage Press, 1996), chs 4–7; Phillips Payson O'Brien, 'The joint chiefs of staff, the atom bomb, the American military mind and the end of the Second World War', *Journal of Strategic Studies*, 42:7 (2019), p. 988.

¹¹⁴Freedman and Michaels, *The Evolution*, p. 28.

¹¹⁵Tsuyoshi Hasegawa, *Racing the Enemy: Stalin, Truman, and the Surrender of Japan* (Cambridge, MA: Harvard University Press, 2005), p. 232; John W. Dower, *Embracing Defeat: Japan in the Wake of World War II* (New York, NY: W. W. Norton & Co, 1999), p. 44.

¹¹⁶Dower, *Embracing Defeat*, p. 36

¹¹⁷Hasegawa, *Racing the Enemy*, p. 296.

historical scholarship. According to Samuel Walker's recent overview of the debates, it appears that most scholars have grown decreasingly convinced of the war-winning nature of Little Boy and Fat Man, with a 'middle-ground' approach seizing the day.¹¹⁸

Another case in point is the authors' treatment of the concept of nuclear winter, which spurred debate about the destructive climatic and ecological impact of nuclear weapons during the 1980s. The new edition of *The Evolution* limits itself to briefly teaching the controversy of the nuclear winter debate of the 1980s, and does not mention either the wealth of corroborating data and scholarship that has appeared in the decades since or engage in analysis of the ideological structures that allowed scientific findings to be brushed aside as 'political'. According to Freedman and Michaels, the notion of a nuclear winter 'seemed to portend the need for a fundamental rethinking of nuclear policy and strategy'; however, it was ultimately ignored by most strategists, as well by as the Reagan administration, which opted to 'continue existing policies rather than re-evaluate them'.¹¹⁹ Indeed, the authors conclude the discussion by asserting that the idea that nuclear war would be catastrophic was 'hardly news'.¹²⁰ Symptomatic of the importance of studying ideas in context, recent scholarship has shown how the downplaying of the political relevance of nuclear winter was in part the result of active information strategies and research funding practices.¹²¹

The book's overall treatment of nuclear weapons as stabilising and war-winning means there is limited engagement with authors who conceive nuclear deterrence practices as irresponsible, irrelevant, or incompatible with the state system. Hans Morgenthau, one of the most central figures of IR and a great critic of nuclear strategy,¹²² is not once mentioned in the book. The 'nuclear realists' referred to above, including renowned thinkers such as John Herz and Günther Anders, are equally absent.¹²³ Perhaps the most famous critique of nuclear strategy – certainly the most prominent from a feminist perspective – is also missing: Carol Cohn's ruthless essay on the sexualised, euphemistic language employed by many nuclear strategists, which enjoys more than 1,500 citations on Google Scholar, is not mentioned.¹²⁴

This is part of a larger absence in the book of any discussion of the lively (if still marginal) literature of 'critical' nuclear security studies produced by authors such as Shampa Biswas,¹²⁵ Anne Harrington,¹²⁶ Ken Booth,¹²⁷ Keith Krause,¹²⁸ Anthony Burke,¹²⁹ David

¹¹⁸Walker, 'Recent literature on Truman's atomic bomb decision', in Costigliola and Hogan (eds), *America and the World*, p. 83.

¹¹⁹Freedman and Michaels, *The Evolution*, p. 509.

¹²⁰Ibid.

¹²¹Simone Turchetti, 'Trading global catastrophes: NATO's science diplomacy and nuclear winter', *Journal of Contemporary History*, early view (2021). The decisive role of the 'merchants of doubts' in shaping climate science and politics is laid out in Naomi Oreskes and Erik M. Conway, *Merchants of Doubt* (New York, NY: Bloomsbury Press, 2011).

¹²²Craig, *Glimmer of a New Leviathan*, pp. 107–16.

¹²³See van Munster and Sylvest, *Nuclear Realism*. Recent scholarship in this vein includes Campbell Craig, 'Solving the nuclear dilemma: Is a world state necessary?', *Journal of International Political Theory*, 15:3 (2019), pp. 349–66; Craig, *Glimmer of a New Leviathan*, pp. 107–16; Anthony Burke, 'Nuclear reason: At the limits of strategy', *International Relations*, 23:4 (2009), pp. 506–29; Ken Booth, *Theory of World Security* (Cambridge, UK: Cambridge University Press, 2007); Deudney, *Bounding Power*. Critical scholarship looking at strategy from 'below' or the perspective of the subaltern include Shampa Biswas, *Nuclear Desire: Power and the Postcolonial Nuclear Order* (Minneapolis, MN: University of Minnesota Press, 2014); Gabrielle Hecht, *Being Nuclear: Africans and the Global Uranium Trade* (Cambridge, MA: MIT Press, 2012).

¹²⁴Carol Cohn, 'Sex and death in the rational world of defense intellectuals', *Signs*, 12:4 (1987), pp. 687–718.

¹²⁵See, for example, Shampa Biswas, *Nuclear Desire: Power and the Postcolonial Nuclear Order* (Minneapolis, MN: University of Minnesota Press, 2014).

¹²⁶See, for example, Anne I. Harrington, 'Power, violence, and nuclear weapons', *Critical Studies on Security*, 4:1 (2016), pp. 91–112.

¹²⁷See, for example, Ken Booth, *Theory of World Security* (Cambridge, MA: Cambridge University Press, 2007).

¹²⁸See, for example, Keith Krause, 'Leashing the dogs of war: Arms control from sovereignty to governmentality', *Contemporary Security Policy*, 32:1 (2011), pp. 20–39.

¹²⁹See, for example, Burke, 'Nuclear reason'; Anthony Burke, *Uranium* (Cambridge, UK: Polity, 2017).

Mutimer,¹³⁰ and Nick Ritchie.¹³¹ The fourth edition could potentially have been used as an opportunity to reflect on the boundaries of the field, analysing the construction of some contributions as ‘critical’ and others as ‘mainstream’, bringing insights from the most influential critics of nuclear strategy into conversation with the so-called canon to open up the field in new directions. Partly as a result of the recency of renewed interest in ‘limited nuclear war’ as a real political option, the authors also pay relatively little attention to the revival of nuclear war strategism, a tradition founded on the notion that deterrence is difficult to achieve and must be bolstered with deliberately risky behaviours and expansive counterforce capabilities.¹³² The deterrence orthodoxy, in other words, appears to be under more pressure than *The Evolution* implies.

Given the authors’ definition of nuclear strategy as attempts at ‘extracting political benefits from nuclear arsenals’, the limited engagement with the critics of nuclear strategy is entirely warranted. The only trouble is that, in the field of nuclear security studies, *The Evolution* functions as much more than a narrow exploration of the relatively niche phenomenon of nuclear posture design. As discussed above, *The Evolution* is regularly presented as a general history of the nuclear age or even the Cold War. The potential problem with this, of course, is that the history of the nuclear age is subliminally turned into a history of how a relatively narrow circle of individuals with (often unacknowledged) ties to the military-industrial complexes of a handful of major powers sought to justify and derive benefits from nuclear arsenals.

Reimagining nuclear security studies

The Evolution encompasses two key empirical findings that fundamentally challenge the field of nuclear security studies. First, the authors’ discussion of nuclear proliferation and national nuclear strategies reveal that decisions to build the bomb have typically been made prior to the formulation of coherent nuclear strategies or operational plans. Accordingly, if strategy describes the art of coupling military means with political ends, decisions to acquire nuclear weapons have typically been decidedly non-strategic.¹³³ Second, Freedman and Michaels find that nuclear debates have been cyclical.¹³⁴ The authors point out that the fundamental ideas ‘tend to be recycled’ and lament the lack of new ideas and fresh thinking.¹³⁵ This implicit call for renewal is welcome. At the same time, it could be argued that the authors’ faith in the basics of deterrence theory and generous praise for the ‘golden age’ strategists contribute to upholding the field’s orthodoxies. As some observers have argued, the absence of new thinking in the field of nuclear policy studies could be explained in part by self-censorship and deference to authorities.¹³⁶ There is a widespread acceptance within the field ‘of what constitutes “serious nuclear scholarship and political theorizing”, and what, conversely, does not’.¹³⁷ In other words, standing on the shoulders of the ‘giants’ and ‘visionaries’ of nuclear strategic thinking almost inevitably

¹³⁰See, for example, David Mutimer, ‘From arms control to denuclearization’, *Contemporary Security Policy*, 32:1 (2011), pp. 57–75.

¹³¹See, for example, Nick Ritchie, ‘Valuing and devaluing nuclear weapons’, *Contemporary Security Policy*, 34:1 (2013), pp. 146–73.

¹³²See, for example, Matthew Kroenig, *The Logic of American Nuclear Strategy* (New York, NY: Oxford University Press, 2018). Critically reviewed by Campbell Craig, ‘The logic of American nuclear strategy’, *Journal of Strategic Studies* (2020), available at: {<https://doi.org/10.1080/01402390.2020.1798582>}.

¹³³For a recent critique of early French nuclear policy, see Benoît Pelopidas and Sébastien Philippe, ‘Unfit for purpose: Reassessing the development and deployment of French nuclear weapons (1956–1974)’, *Cold War History*, 21:3 (2021), pp. 243–60.

¹³⁴Freedman and Michaels, *The Evolution*, p. xi.

¹³⁵*Ibid.*, pp. 672–3.

¹³⁶Benoît Pelopidas, ‘Nuclear weapons scholarship as a case of self-censorship in security studies’, *Journal of Global Security Studies*, 1:4 (2016), pp. 326–36.

¹³⁷Carina Meyn, ‘Realism for nuclear-policy wonks’, *Nonproliferation Review*, 25:1–2 (2018), p. 115.

implies accepting the supposed axioms of the nuclear age, including ‘the attraction of a sudden attack’ and the ‘necessity of a capability for retaliation’.

One way forward is to deal with the concepts crafted by strategists and policymakers as categories of analysis, rather than categories of practice, and to further investigate the social conditions of intellectual supremacy. Future scholarship could dig further into the nature and drivers of nuclear strategy, investigating the life cycle of nuclear concepts and categories. Placing nuclear categories into historical, social, and transnational contexts could widen the scope for nuclear thinking. Furthermore, nuclear security studies could gain from further employment of counterfactual analysis. Counterfactual thinking can help make sense of nuclear close calls and integrate them in a less confident narrative of nuclear history. Beyond passing references and analyses of deterrent threats ‘that leave something to chance’,¹³⁸ mainstream strategic studies has paid limited attention to luck and contingency in nuclear affairs.¹³⁹ In Peter Katzenstein’s words, security studies and IR have displayed unwarranted ‘overconfidence in controllability and predictability’.¹⁴⁰ We maintain that, as other fields of policy, nuclear history must be seen as a ‘field of possibility’ rather than a teleological process.¹⁴¹ In understanding how nuclear policies and strategies were formed, then, it is crucial to understand how contingencies and imagined futures informed conceptions of responsible action. After all, if the present is shaped by the past, it is also shaped by how we conceive the possible futures of our world. A supposed ‘nuclear eternity’, for instance, has framed debates and thinking about nuclear weapons for decades.¹⁴²

In *Why Read the Classics*, Italo Calvino maintains that ‘a classic is a work which persists as a background noise even when a present that is totally incompatible with it holds sway’.¹⁴³ As scholars of nuclear issues, we must wonder if our present is compatible with our classics. Many of the texts discussed in *The Evolution* are classics for a time that has passed. Despite rising awareness about global warming, environmental challenges, global health issues, and disruptive technological shifts,¹⁴⁴ nuclear security studies has continued to whirl around the questions, assumptions, and challenges posed by a relatively narrow circle of American defence experts in the 1950s and 1960s. Much of the scholarship on nuclear strategy celebrates the non-use of nuclear weapons ‘in anger’ since 1945, without reflecting seriously on strategists’ role in justifying both arms racing and the more than 2000 nuclear test explosions carried out since 1945. Angry or not, nuclear testing has caused dramatic challenges for global health and local communities and habitats.¹⁴⁵ Moreover, as a consequence of the limits of knowledge during the 1950s, 1960s, and 1970s, the ‘classical’ nuclear thinkers were largely oblivious to what is by now a widely

¹³⁸Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960), ch. 8.

¹³⁹There are recent exceptions, however, such as Martin J. Sherwin, *Gambling with Armageddon: Nuclear Roulette from Hiroshima to the Cuban Missile Crisis, 1945–1962* (New York, NY: Alfred A. Knopf, 2020); Serhii Plokhyy, *Nuclear Folly: A History of the Cuban Missile Crisis* (New York, NY: W. W. Norton & Company, 2021); Richard Ned Lebow and Benoit Pelopidas, ‘Facing nuclear war’, in Mlada Bukovansky, Edward Keene, Chris Reus-Smit, and Maja Spanu (eds), *The Oxford Handbook on History and International Relations* (Oxford, UK: Oxford University Press, forthcoming).

¹⁴⁰Peter J. Katzenstein, ‘Protean power: A second look’, *International Theory*, 12:3 (2020), pp. 481–99.

¹⁴¹François Furet, *Interpreting the French Revolution* (Cambridge, UK: Cambridge University Press, 1981), p. 19.

¹⁴²Benoit Pelopidas, ‘The birth of nuclear eternity’, in Jenny Andersson and Sandra Kemp (eds), *Futures* (Oxford, UK: Oxford University Press, 2021), pp. 484–500; Hebatalla Taha, ‘Misremembering the ACRS: Economic imaginations and nuclear negotiations in the Middle East’, *Global Affairs*, 7:3 (2021), pp. 327–42.

¹⁴³Italo Calvino, *Why Read the Classics?* (London, UK: Penguin Classics, 2009), p. 6.

¹⁴⁴See, for example, Lyndon Burford, ‘A global commission on military nuclear risk’, *European Leadership Network* (25 June 2019), available at: {<https://www.europeanleadershipnetwork.org/commentary/a-risk-driven-approach-to-nuclear-disarmament/>}; World Economic Forum, *The Global Risk Report 2020* (Geneva, 2020); Seth Baum, ‘Winter-safe deterrence’, *Contemporary Security Policy*, 36:1 (2015), pp. 123–48.

¹⁴⁵Studies suggest that atmospheric nuclear testing has caused several hundreds of thousands of excess cancer deaths since 1945, and that the total number will rise to over two million over time. See Tilman A. Ruff, ‘The humanitarian impact and implications of nuclear test explosions in the Pacific region’, *International Review of the Red Cross*, 97:899 (2015), pp. 807–08. Evidence of such harm is still being unearthed. For an example from France, see Sébastien Philippe and Tomas Statius, *Toxicque: Enquête Sur Les Essais Nucléaires Français En Polynésie* (Paris: PUF/Discluse, 2021).

accepted view in the scientific community, namely that even a limited nuclear war would pose a worldwide threat through ozone destruction and climate change.¹⁴⁶ For a community characterised by its preoccupation with quantification and numbers – warheads, launchers, significant quantities, bomber bases, etc. – the lack of response to scientific findings about the climatic consequences of nuclear war is striking. One should think, for example, that it would be of immense importance to strategists and force planners whether the use of one hundred nuclear weapons would cause two million, two hundred million, or two billion casualties. Like those living at the height of the Cold War, we, too, must ‘face the true terror of this moment’, and prepare the entrance of nuclear security studies to a new age.¹⁴⁷

Acknowledgements. We are grateful to Benoit Pelopidas, Grey Anderson, David Holloway, Campbell Craig, Jon Haarberg, and *EJIS*'s editors and anonymous reviewers for helpful comments and suggestions. All errors are ours alone. This article is part of the NUCLEAR project that has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No. 759707).

Kjølvs Egeland is a postdoctoral research fellow at CERi, Sciences Po in Paris (NUCLEAR project). He works on strategic narratives and nuclear arms control and disarmament. Kjølvs finished his DPhil in International Relations at the University of Oxford in 2018.

Thomas Fraise is a PhD candidate at Sciences Po in Paris (NUCLEAR project), working on secrecy and the governance of nuclear knowledge in democracies.

Hebatalla Taha is assistant professor at the American University in Cairo, and an associate researcher with the Nuclear Knowledges Programme at CERi, where she previously worked as a postdoctoral research fellow on the NUCLEAR project. Her research is at the intersection of violence, nuclear histories, and economy in the Middle East. Heba completed her DPhil at the Faculty of Oriental Studies at the University of Oxford in 2017.

¹⁴⁶See, for example, Michael J. Mills et al., ‘Multidecadal global cooling and unprecedented ozone loss following a regional nuclear conflict’, *Earth's Future*, 2:4 (2014), pp. 161–76; Alan Robock and Owen B. Toon, ‘Self-assured destruction: The climate impacts of nuclear war’, *Bulletin of the Atomic Scientists*, 68:5 (2012), pp. 66–74.

¹⁴⁷Anthony Burke et al., ‘Planet politics: A manifesto from the end of IR’, *Millennium*, 44:3 (2016), pp. 499–523.