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Redemption and Nutopia: The Scope of Nuclear Critique in International Studies

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Abstract

What should the scope of nuclear critique within international studies be? This article addresses that question by making two interrelated arguments. First that political programmes of international nuclear order are crucially underpinned by what is termed here as 'nutopianism': a mode of understanding nuclear power that is imbued with a spirit of technological optimism in relation to 'peaceful' nuclear power, but simultaneously qualified by an awareness of the destructive uses and catastrophic potentialities of nuclear weapons. Second, that such nutopianism is in turn predicated on the 'saving power' of 'the atom': the assumption that nuclear power has redeeming features crucial to human progress and economic prosperity, the development of which should be facilitated within the structures of international order. The article makes the case that critical thought within international studies focuses on nuclear weapons with international order, but has tended to remain largely silent on the issue of 'civil' nuclear power beyond nuclear weapons and the complex imbrications between the two. On that basis the article considers whether a more holistic and expansive form of nuclear critique is both possible and necessary.

Keywords

Nuclear, nuclearism, critique, nuclear weapons, international studies, international order.

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Introduction

I'm a scientist and an inventor, and it is absurd to reject nuclear energy [...] It all comes from the religious side. They feel guilty about dropping atom bombs on people. Here was this extraordinary gift given to humans – a safe, cheap source of power – and it gets horribly abused right at the start. We're still playing out the guilt [sic] feelings about it. But it's sad because we in Britain could now be having cheap energy if we'd gone on building [nuclear power stations].

- James Lovelock (2015)¹

We do better to overcome our denial and dissociation and to instead acknowledge that radiation effects are one and the same no matter what their source, that the combination of nature and human fallibility makes no technology completely safe, and the technology most dangerous to us can hardly be relied upon to provide something 'clean' or pure, or to otherwise redeem us.

- Robert Jay Lifton (2011).²

The quotation above from James Lovelock – renowned as the originator of 'Gaia Theory'³ – stands as a pertinent reminder that technological optimism still has a presence in contemporary debates on nuclear power. Elements of such optimism can also still routinely be found in the promotion of new 'generations' of nuclear power stations as a means (or key component of the means) to combat global climate change; in arguments for 'small modular reactors' as the future of household electrical provision;⁴ and in continuing hopes for fusion technologies as the power source of the future.⁵ Lovelock's characterization, however, suggests that the history of and prospects for nuclear power looks forever damned by the dropping of the atomic bombs on Hiroshima and Nagasaki consequent ensuing 'guilt'. The latter 'feelings', he asserts, lead to continuing misguided rejection of nuclear power ('this extraordinary gift to humans'), with the UK is cited as a particular example of how such 'religiosity' has impeded the development of 'a safe, cheap source of power'.⁶ By way of contrast, the characterization expressed by Robert Jay Lifton, suggests a diametrically opposed caution towards the assumed 'redeeming' aspects of nuclear

¹ James Lovelock, as quoted in Moss, Stephen Moss (2014) 'James Lovelock: "Instead of robot taking over the world, what if we join with them"?'', *The Guardian*, 30 March 2014, np. Available at <http://www.theguardian.com/environment/2014/mar/30/james-lovelock-robots-taking-over-world>. Last accessed May 6, 2015.

² Robert Jay Lifton, 'Fukushima and Hiroshima', *The New York Times*, 15 April 2011, np. Available at http://www.nytimes.com/2011/04/16/opinion/16iht-edlifton16.html?_r=1&. Last accessed May 6, 2015.

³ Or 'Gaia Theory' – originally articulated in James Lovelock, *Gaia: New Look at Life on Earth* (Oxford: Oxford University Press, 1979).

⁴ World Nuclear Association, 'Small Nuclear Power Reactors', 30 April 2015. Available at <http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Power-Reactors/Small-Nuclear-Power-Reactors/>. Last accessed May 6, 2015.

⁵ See CCFE (Culham Centre for Fusion Energy). Available at <http://www.ccf.ac.uk/>. Last accessed May 6, 2015.

⁶ As quoted in Moss, 'James Lovelock', np.

power, and a refusal to make Lovelock's strict distinction between nuclear technologies as weapons of destruction and providers of energy.

Despite the opposition of their views, both Lovelock and Lifton invoke notions of 'guilt' and 'redemption'. The argument made below is that this is not only a thematic engaged by such broader reflections on the nature of the 'nuclear age', but also crucially underpins attempts to construct and legitimate international nuclear order.⁷ To characterize this kind of thinking the concept of 'nutopia' is here employed as a contraction of the terms 'nuclear' and 'utopia', a portmanteau word used as shorthand to denote a form of technological optimism in which nuclear power and technologies are identified as key to a more progressive human future. Hopes articulated in the 1950s that the advent of nuclear power would lead to the creation of utopian 'white cities' powered by 'electrical energy too cheap too meter' - to accompany '...expectations that our children will know of great periodic regional famines in the world only as matters of history, will travel effortlessly over the seas and under them with a minimum of danger and with great speeds, and will experience a lifespan far longer than ours, as disease yields and man comes to understand what causes him to age'⁸ - are, Spencer Weart argues, a key part of the 'imagery' of the nuclear age.⁹ Insofar as the promotion of nuclear power is imbued and bound up with different national variants of technological utopianism and futuristic visions¹⁰, though, it might now be argued that such utopianism is now routinely taken with a large dose of ingrained cynicism. The regular near-meltdowns of Springfield's nuclear power station in the animated television comedy *The Simpsons* is but one iteration of an embedded scepticism about nuclear power in a popular cultural form that reaches millions of viewers worldwide and in eight languages other than English. What might

⁷ By way of clarification and qualification, the title of this article is a wordplay on Michael Löwy's *Redemption and Utopia: Jewish Libertarian Thought in Central Europe – A study in elective affinity* (London: The Athlone Press, 1992). As the difference in the subtitles suggests, the article has an otherwise thin relation to Löwy's thesis that thinkers as diverse as Martin Buber, Franz Kafka, Georg Lukács and Walter Benjamin were united by a shared affinity for and concern with the Kabbalistic idea of *Tikkoun* ('redemption'). Equally, the use of the term 'nutopia' here does not substantively draw on or engage with John Lennon and Yoko Ono's 'declaration', on April 1st 1973, of 'a conceptual country' of the same name in the midst of Lennon's struggle to gain permanent resident status in the United States - See 'John Lennon & Yoko Ono – Nutopia Announcement', 1 April 1973. Available at <https://www.youtube.com/watch?v=5xOzjDfmPCK>. Last accessed March 6, 2015.

⁸ The remarks are attributed to Lewis Strauss, then as Head of the US Atomic Energy Commission (AEC), speaking in September 1954. Recent retrospectives on Strauss's remarks (reportedly made in a speech to the US National Association of Science Writers on September 16th, and as recorded and popularized by the New York Times in an article published the following day) contend that Strauss made no explicit reference to nuclear power as the (sole) source of 'electricity too cheap to meter' (although his status within the AEC might reasonably suggest that assumption as implicit). See media.cns, 'Too Cheap to Meter?', 20 February 2009. Available at <http://media.cns-snc.ca/media/toocheap/toocheap.html>. Last accessed May 6, 2015.

⁹ Spencer R. Weart, *Nuclear Fear: A History of Images* (Cambridge MA: Harvard University Press, 1988) pp.5-7. An updated version, but broadly consistent with the arguments of the initial publication, is Spencer R. Weart, *The Rise of Nuclear Fear* (Cambridge MA: Harvard University Press, 2011).

¹⁰ See, amongst others: Weart, *Nuclear Fear* and *The Rise of Nuclear Fear*; Paul Josephson, 'Technological Utopianism in the Twenty-First Century: Russia's Nuclear Future', *History and Technology* 19, no.3 (2003): 277-292; Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge, MA: MIT Press, 2009); M.V. Ramana, *The Power of Promise: Examining Nuclear Energy in India* (New Delhi: Viking, 2012).

be regarded as the ‘golden age’ of nuclear utopianism in the 1950s, ‘60s and ‘70s gave way to persistent concerns over the safety and efficacy of nuclear power, especially in the wake of events such as Three Mile Island in 1979, Chernobyl in 1986, and Fukushima Daiichi in 2011. More generally, the continuing legacies of attempted shifts to a ‘plutonium economy’¹¹, the technical challenges of developing technologies such as ‘Fast Breeder Reactors’, issues associated with the disposal and storage radioactive waste, and the financial costs of developing nuclear power facilities have all arguably combined to create significant wariness towards visions of nuclear utopias. Hence nuclear utopianism might be regarded, as Sheldon Ungar puts it, as a kind of ‘tarnished faith’.¹²

And yet, as the article seeks to illustrate, programmes for the regulation of the international nuclear order continue to be centrally predicated on the promised benefits and redeeming features of nuclear power. The remains a crucial aspect of the animating rationales and purposes of, to name two of the most prominent examples, the Nuclear Non-Proliferation Treaty (NPT) and the International Atomic Energy Agency (IAEA). The article consequently makes the interrelated contentions: that international proposals to control, reduce and end horrific potential of nuclear weapons tend to be predominantly and crucially predicated on assumed redeeming features of nuclear power as an embedded form of ‘common sense’; and that critical approaches within international studies end up leaving the ‘nuclear utopianism’ underpinning such proposals largely unquestioned.

To date, as is argued in detail in the section below, the dominant object of critique within international studies has been nuclear weapons. The problem of ‘nuclearism’ as originally identified in the seminal (1982) critique of the international nuclear order by Robert Jay Lifton and Richard Falk¹³ was specifically delimited precisely as a *weapons* problem, and critical work in international studies has generally tended to reproduce that assumption. This article does not suggest that this is unimportant or seek to undermine the significance work in that vein. Rather it makes the case that a significant proportion of critical international thought assumes and reproduces a straightforward distinction between ‘civil’ and ‘military’ nuclear power as a given, with a concurrent emphasis on nuclear weapons as *the* problem of international nuclear order. In doing so, such critiques leave unexamined the common suturing of ‘constructive’ and ‘destructive’ applications of nuclear power within programmes of international nuclear order.¹⁴ Yet as William Walker puts it, the ‘central question of the nuclear age’ has, precisely:

¹¹ See, relatedly, Kate Brown, *Plutopia: Nuclear Families, Atomic Cities, and the Great Soviet and American Plutonium Disasters* (Oxford: Oxford University Press, 2013).

¹² As cited in Robert Jay Lifton ‘Illusions of the Second Nuclear Age’, *World Policy Journal* 18, no.1 (2001): 25-30, p.27.

¹³ Robert Jay Lifton and Richard Falk, *Indefensible Weapons: The Political and Psychological Case Against Nuclearism* (New York: Basic Books, 1982).

¹⁴ By way of contrast, more ‘mainstream’ (in the sense of not explicitly self-identifying as adopting a critical approach) analyses have foregrounded the ‘dual use’ nature of nuclear power and the development of ‘domestic’ nuclear energy programmes as a central feature and problem of international order; see, most prominently, Matthew Fuhrmann, *Atomic Assistance: How “Atoms for Peace” Programs Cause Nuclear Insecurity* (Ithaca: Cornell University Press, 2012).

[...] been how to draw states into [a] logic representing a pragmatic middle way – *a logic of restraint*. This has entailed accepting the presence of nuclear weapons in the world “for the time being” whilst placing limits on their possession and usage, without unduly impeding either deterrence or the diffusion of nuclear materials and technologies for civil purposes. Installing and embedding this logic and rendering it tolerable have lain at the heart of the problem and project of nuclear order.¹⁵

Indeed the lasting centrality of this logic to practical programmes for the creation of international nuclear order becomes all the more worthy of critical examination in the midst of the increased scepticism towards nuclear utopianism referred to above.

To begin such an examination, the article employs an illustrative method that highlights multiple episodic iterations and reiterations of such ‘nutopianism’ as a form of common sense argumentation over time. Here ‘common sense’ is used in the Gramscian conception of a form of understanding that has become embedded within political discourse, a ‘syncretic historical residue [...] an amalgam of historically effective ideologies, scientific doctrines and social mythologies’¹⁶ that has become ‘common’.¹⁷ Specifically, in the sections on ‘Nutopianism and International Order’ and ‘Making the world safe for the development of nuclear power?’ the focus of the article is on exemplifying common sense articulations of the redeeming features of nuclear power. Once this interrelation of arguments for ‘constructive’ uses of nuclear technologies and against ‘destructive’ destructive applications is recognised, a legitimate question can be raised as to whether the scope of nuclear critique within international studies should be expanded in a more holistic and encompassing sense to include critique of nutopianism, as is discussed in the section ‘Nuclearism reconsidered’. It may be that a more discrete form of nuclear weapons critique may be worth persevering with. But at the very least it would be worth reflecting on the grounds for doing so, and the latter stages of the article outlines potential reasons for reconsidering the scope of nuclear critique in a more expansive fashion.

The scope of nuclear critique: ‘Nuclearism’ and its discontents

In a review of ‘Critical Thinking about Nuclear Weapons’, Benoît Pelopidas recommends that ‘critical thinkers’ should ‘challenge the accepted causal relationships between phenomena, investigate previously neglected or “unauthorized problems” [...] Similarly, examining issues that the most critical experts (willing to be recognized as such) do not challenge sheds light on what binds the community together in descriptive and prescriptive terms’.¹⁸ So what is it that such ‘critical experts’ might challenge and not challenge? In large part the scope of nuclear critique

¹⁵ William Walker, *A Perpetual Menace: Nuclear Weapons and International Order* (Oxon: Routledge, 2012) p.5, emphasis in original. The term ‘international nuclear order’ is used in this article as my own shorthand for the characterisation of the ‘project of nuclear order’ that Walker offers here.

¹⁶ Mark Rupert, ‘Globalising Common Sense: a Marxian-Gramscian (re-)Vision of the Politics of Governance/Resistance’, *Review of International Studies* 29, December (2003): 181-98, p.185.

¹⁷ Antonio Gramsci, *Selections from the Prison Notebooks* (London: Lawrence and Wishart, 1973) pp.328-331. For a more detailed discussion of the approach adopted here, see Columba Peoples, *Justifying Ballistic Missile Defence: Technology, Security and Culture* (Cambridge: Cambridge University Press, 2010), pp.41-44.

¹⁸ Benoît Pelopidas, ‘Critical Thinking about Nuclear Weapons’, *Non-Proliferation Review*, 17, no.1 (2010): 189-196, p.190.

within international studies is already identified in Pelopidas' title, with added emphasis, of 'Critical Thinking *about Nuclear Weapons*'. The most prominent exemplar in this respect is Robert Jay Lifton and Richard Falk's identification of 'nuclearism' as 'psychological, political and military dependence on nuclear weapons, [and] the embrace of weapons as a solution to a wide variety of human dilemmas, most ironically that of "security"'.¹⁹ For Lifton in particular²⁰ the invention and use of nuclear weapons – and the attendant horrors of the aftermath of the nuclear bombings of Hiroshima and Nagasaki²¹ – requires a particular kind of psychological structure that both suppresses knowledge of the effects of use of these weapons and, simultaneously, maintains the 'reasonable' assumption that the existence and continued possession of such weapons by states creates security. Yet insofar as, for Lifton, '...security means feeling safe, experiencing one's environment as reliable and, generally speaking, life enhancing', the 'central existential fact of the nuclear age is *vulnerability*'.²² The 'nuclear age' has been made possible by a form of technological revolution, but is only sustainable if it is accompanied by a particular mode of acceptance of and dependence on nuclear weapons as assumed instruments of security provision.

Lifton of course argues that the 'central existential fact' of nuclear vulnerability inherently undermines the 'rationality' of security predicated on nuclear weapons, and precisely creates a countervailing 'impulse' to '[reclaim] the opposite and infinitely more comfortable state of security'.²³ Ken Booth subsequently identified a need to move away from a 'negative synergy' of 'nuclearism and security' – where security is assumed to be dependent on nuclear weapons – to a 'positive synergy' of 'human rights and security'. The latter would necessarily encompass the elimination of nuclear weapons based on the logic, as concisely articulated in Booth's terms, of '...zero [nuclear weapons] as the only rational goal'.²⁴ Similarly, although drawing less explicitly on the concept of nuclearism, there are arguably strong parallels between the feminist critique of nuclear weapons espoused by Carol Cohn and Sara Ruddick²⁵ and Lifton's emphasis on the bodily effects of nuclear weapons in Hiroshima and Nagasaki. In both the corporeal effects of nuclear weapons are placed

¹⁹ Lifton and Falk, *Indefensible Weapons*, p.ix.

²⁰ Lifton and Falk's *Indefensible Weapons* contains a co-authored preface and conclusion, but is subdivided into Section I ('Imagining the Real') authored by Lifton and Section II ('The Political Anatomy of Nuclearism') by Falk, hence my characterisation of Lifton's arguments as discrete, when citing Section I of the text.

²¹ See also, in particular, Robert Jay Lifton and Greg Mitchell, *Hiroshima in America: A Half Century of Denial* (New York: Avon Books, 1995) and Robert Jay Lifton and Eric Markusen, *The Genocidal Mentality: Nazi Holocaust and Nuclear Threat* (New York: Basic Books, 1990).

²² Lifton in *Indefensible Weapons*, p.23. Emphasis in original.

²³ Lifton in Lifton and Falk, *Indefensible Weapons*, p.23.

²⁴ Ken Booth 'Nuclearism, human rights, and constructions of security (part 1)', *International Journal of Human Rights* 3, no. 2 (1999): 1-24, p.2; p.14. Cf. Anthony Burke, 'Nuclear Reason: At the Limits of Strategy', *International Relations* 23, no.4 (2009): 506-529.

²⁵ Carol Cohn, 'Sex and Death in the Rational World of Defense Intellectuals', *Signs: Journal of Women in Culture and Society* 12, no.4 (1987):687-718; Carol Cohn and Sara Ruddick, 'A Feminist Ethical Perspective on Weapons of Mass Destruction', Consortium on Gender, Security and Human Rights, 2003. Available at http://cgshr.resonetrics.com/sites/default/files/a_feminist_ethical_perspective_on_weapons_of_mass_destruction_0.pdf. Last accessed May 6 2015.

at the forefront in order illustrate and cut through the ‘ways that the abstraction and euphemism of nuclear discourse protect nuclear planners and politicians from the grisly realities behind their words’²⁶, and how, especially when set in the context of the suffering endured by Hiroshima victims and survivors the euphemisms of ‘nukespeak’ have an ‘anesthetizing quality’ and ‘provide a way of talking about nuclear weapons without really talking about them’.²⁷

It might be argued that, ostensibly at least, such critiques of nuclearism within international studies are particularly apposite to an apparent ‘renaissance in [nuclear] disarmament politics’ within the past decade.²⁸ The policy advocacy work of the so-called ‘four horsemen’ - former US Secretary of State George P. Shultz, former Secretary of Defense William J. Perry, former Secretary of State Henry A. Kissinger and former Senator Sam Nunn (see the ongoing ‘Nuclear Security Project’²⁹, established in 2007) – is often credited with having generated a ‘sustained scholarly debate over the desirability and feasibility of nuclear abolition’.³⁰ Variations of the ‘zero [nuclear weapons] as the only rational goal’ logic appeared within President Obama’s ‘Prague Speech’³¹ (in terms of its rhetoric at least), and the wider campaign and debates on ‘Getting to Zero Nuclear Weapons’.³² Initiatives such as the ‘Humanitarian Impact of Nuclear Weapons’ might also be said to crucially incorporate a focus on the corporeal effects and physical environmental and ecological impacts of nuclear weapons as an intended spur towards global nuclear disarmament. One of the foremost historians of nuclear deterrence could confidently assert by 2011 that ‘The idea that nuclear weapons can and should be completely eliminated has achieved a degree of interest and credibility that it has not enjoyed since the first decade of the nuclear age, not least because of some high profile supporters’.³³ Thus attention to and further development of critical perspectives on nuclear weapons within international studies is arguably particularly relevant and timely. Catherine M. Kelleher and Scott L. Warren argued in the wake of Obama’s Prague speech that ‘A critical debate on nuclear weapons is once again in the limelight’ and that ‘Under the Obama policy, zero nuclear weapons is for the first time in US history, an operational, tangible US policy goal and thus a measuring stick

²⁶ Cohn and Ruddick, ‘A Feminist Ethical Perspective’, p.12.

²⁷ Lifton in *Indefensible Weapons*, pp.38-47; p.106-107, emphasis in original.

²⁸ Anne Harrington de Santana, ‘The Strategy of Non-proliferation: Maintaining the Credibility of an Incredible Pledge to Disarm’, *Millennium* 40, no.1 (2011): 3-19, p.6.

²⁹ Nuclear Security Project, ‘About NSP’, no date. Available at

<http://www.nuclearsecurityproject.org/about/about-nsp>. Last accessed May 6 2015.

³⁰ Martin Senn and Christoph Elhardt, ‘Bourdieu and the bomb: power, language and the doxic battle over the value of nuclear weapons’, *European Journal of International Relations* 20, no.2 (2014): 316-340, p.317.

³¹ ‘Remarks by President Barack Obama, Hradcany Square, Czech Republic’, 5 April, 2009. Available at http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered. Last accessed May 6 2015.

³² See ‘Global Zero: A world without nuclear weapons’, no date. Available as <http://www.globalzero.org/>. Last accessed May 6 2015.

³³ Lawrence D. Freedman, ‘[Review of Catherine M. Kelleher and Judith Reppy (eds.)] *Getting to Zero: The Path to Nuclear Disarmament*’, in *Foreign Affairs*, September/October 2011, np. Available at <http://www.foreignaffairs.com/articles/68155/catherine-kelleherjudith-reppy/getting-to-zero-the-path-to-nuclear-disarmament>. Last accessed May 6 2015.

against which to judge a host of shorter-range, less ambitious initiatives and arguments'.³⁴

Doubtless critical thinking in its various forms within international studies can have a significant contribution to make in evaluating such initiatives, and the extent to which, for example, Obama's Prague vision is manifested in substantive efforts by the US (and other states) towards nuclear disarmament and renunciation of nuclear weapons (or not – Kelleher and Warren's 'measuring stick'). But critical thinking in international studies might consider whether focusing predominantly (if not at times exclusively) on nuclear weapons is sufficient. When Ken Booth in his critique of nuclearism uses the terms 'pro-' and 'anti-nuclear', or 'anti-nuclear opinion'³⁵, he has in mind, strictly speaking, 'pro-' and 'anti-nuclear' *weapons*. That may seem like sheer pedantry; but the limitation of the critique of nuclearism to a focus on weapons, although consistent with Lifton and Falk's original use of the term, arguably enacts a hard distinction between 'civil' and 'military' nuclear power. This tendency to frame nuclear weapons as *the* central marker and problem of the 'nuclear age' remains characteristic also of more recent critical interventions within international studies. Marianne Hanson, for example, calls for '...an informed critical security studies project that explicitly tackles the question of nuclear weapons at a global level'.³⁶ And when Rens van Munster and Casper Sylvest turn to an earlier tradition of 'nuclear realism' in the 1950s as an attempt to reinvigorate contemporary critical thinking and 'reclaim nuclear politics for a wider public', both their identification of that tradition and the contemporary 'nuclear politics' they seek to relate it to are, fundamentally, focused on a concern with nuclear weapons.³⁷

Nutopianism and International Order

While there is much to commend in this scholarship, it could be argued that such critiques of nuclearism, in their assumption of the 'nuclear age' as the 'nuclear *weapons* age', unintentionally reproduce the fetishisation of nuclear weapons that they set out to critique - to the virtual exclusion of other potential dimensions of nuclear politics, risk and insecurity.³⁸ The original formulation of the concept of 'nuclearism' locates nuclear weapons 'at the heart of our fear'.³⁹ The concept of

³⁴ Catherine M. Kelleher and Scott L. Warren (2009) 'Getting to Zero Starts Here: Tactical Nuclear Weapons', *Arms Control Today* October 2009, np. Available at http://www.armscontrol.org/act/2009_10/Kelleher. Last accessed May 6 2015.

³⁵ Booth 'Nuclearism, human rights, and constructions of security (part 1)', p.3.

³⁶ Marianne Hanson, 'Nuclear Weapons in the Asia-Pacific' in Anthony Burke and Matt McDonald (eds.) *Critical Security in the Asia-Pacific* (Manchester: Manchester University Press, 2007) pp.183-196, p.197; cf. Marianne Hanson, 'Nuclear Weapons as Obstacles to International Security', *International Relations* 16, no.3 (2002): 361-379, and Burke, 'Nuclear Reason'.

³⁷ Rens van Munster and Casper Sylvest, 'Reclaiming nuclear politics? Nuclear realism, the H-Bomb and globality', *Security Dialogue* 45, no.6 (2014): 530-547; p.530; and, e.g. pp.535-536 and 543.

³⁸ Work in a broadly cultural anthropological vein, though beginning from a focus on nuclear weapons, arguably better situates that focus within wider social and nuclear technical infrastructures – for example, Hugh Gusterson, *People of the Bomb: Portraits of America's Nuclear Complex* (Minneapolis, MN: University of Minnesota Press, 2004), especially pp.206-220; and Joseph P. Masco, *The Nuclear Borderlands: The Manhattan Project in Post-Cold War New Mexico* (Princeton, NJ: Princeton University Press, 2006).

³⁹ Lifton in *Indefensible Weapons*, p.61.

‘nutopia’ and the corresponding set of ideas labelled here as ‘nutopianism’ is suggested here to additionally capture specific features of visions for international nuclear order that retains the utopian intuitions of the ‘white cities’ line of thinking, but qualifies this with a concern with construction and use of nuclear weapons. Crucially, then, nutopianism is predicated upon the assumption that nuclear power has redeeming features that outweigh its destructive applications. Indeed ‘redemption’ has been and arguably remains central to the justification of projects for international nuclear order, and its religious overtones have not gone unnoticed.⁴⁰ Walker, for example, muses that ‘Perhaps not coincidentally for the United States, the main architect of this order, the idea of progressive overcoming was redolent of the Christian story of original sin (the nuclear weapon’s invention, Hiroshima and Nagasaki) precipitating the fall (the Cold War) followed by eventual redemption (through political transformation and the weapon’s elimination).’ ‘Whatever this story’s relevance’, he continues, as the Cold War unfolded and then after the USSR’s collapse, ‘the notion that the problem of nuclear weapons was capable of progressive limitation despite the anarchic nature of the international system gathered support.’⁴¹

The ‘story’ of the redemption of nuclear power in the wake of the atomic bombings of Hiroshima and Nagasaki is a potentially more significant facet of nuclear-order building than even Walker’s characterisation above might initially suggest. At the very least, as Walker’s rich and fine-grained analysis itself attests to, international nuclear order-building has been marked by the persistent accompaniment of identification of the ‘perpetual menace’ of nuclear weapons (Walker’s term) on the one hand with what might be termed as the ‘perpetual promise’ of nuclear power on the other.⁴²

Such overt tones of the religiosity of the theme of ‘redemption’ can be detected in, for example, President Dwight D. Eisenhower’s famous ‘Atoms for Peace’ address to the United Nations General Assembly in December 1953:

Occasional pages of history do record the faces of the “great destroyers”, but the whole book of history reveals mankind’s never-ending quest for peace and mankind’s God-given capacity to build [...] my country’s purpose is to help us move out of the dark chamber of horrors into the light, to find a way by which the minds of men, the hopes of men, the souls of men everywhere, can move forward towards peace and happiness as well-being [...] salvation cannot be attained by one dramatic act’ but instead by [...] many steps.⁴³

⁴⁰ The etymology of the word of course indicates the residues of its origins as of the act of being ‘saved’, from error or sin, in a theological sense.

⁴¹ Walker, *A Perpetual Menace*, p.6.

⁴² As but one example, Walker notes the first report of the British Maud committee (1941) as a key point of ‘awakening’ to the potential military applications and unprecedented destructive capacity of nuclear power in weaponised form, the key initial point of ‘securitisation’ of nuclear power as an existential threat: ‘...the important point is that the production of plutonium for weapons and for civil purposes was mixed up from the start, a complication that would later both prompt and dog the development of international controls on the diffusion of nuclear technology’ – *A Perpetual Menace*, p.35 .

⁴³ President Dwight D. Eisenhower, Address the United Nations General Assembly, 8 December 1953, np. Available at <https://www.iaea.org/about/history/atoms-for-peace-speech>. Last accessed May 6 2015.

But even long before then, and indeed even before the use of nuclear weapons on Hiroshima and Nagasaki, the redemptive utopian trope had been well established. Dedicated to the radiochemist Frederick Soddy (credited, along with Ernest Rutherford, with making path-breaking findings into the nature of radioactivity) and his ‘Interpretation of Radium’, H.G. Wells’s *The World Set Free* arguably stands as the archetype of this kind of redemptive imagining of nuclear power.⁴⁴ Not always considered among the best of Wells’ writings, *The World Set Free* is more often noted for its prescience in relation to the development of ‘atomic bombs’ in particular. Written in 1913 and published in 1914, the book imagines a world war (the ‘Last War’) in the 1950s in which whole cities are destroyed by such weapons, primed and dropped from aircraft: ‘...these atomic bombs which science burst on to the world that night were strange even to the men that used them’.⁴⁵ But, as Weart notes, in the book ‘The near extinction of civilization taught the survivors a lesson, and they created a world government that nurtured a brilliant new society.’ Wells’ utopia – which in the book is a form of world republic replete with atomic-powered flying cars and garden cities, where citizens ‘enjoying liberty and free love’ are governed by select members of a scientific elite – imagines a world in which nuclear power first destroys and then saves the world.⁴⁶ As humanity comes to better understand the nature of atomic power and its potentialities, it revolutionises political structures accordingly, and ultimately redeems itself: ‘The catastrophe of the atomic bombs which shook men out of cities and businesses and economic relations shook them out of their old established habits of thought, and out of the lightly held beliefs and prejudices that came down to them from the past’.⁴⁷

The limits of Wells’ prescience were of course in the fact that he imagined there would be a world worth living in (and governing) in the wake of nuclear-armed conflict. Post-1945 utopianism is predicated on the assumption that humanity cannot afford to ‘learn’ such a ‘lesson’ based on the actual experience of the use of nuclear weapons in war, and that the structures of international order needed to be radically adjusted accordingly.⁴⁸ Similarly, the utopianism of the nuclear age is not always so clearly marked by Wells’ certitude and specificity as to the multiple progressive applications of nuclear power:

...the science, the technology, the industrial development involved in the so-called beneficial uses of atomic energy appear to be inextricably intertwined with those involved in making atomic weapons [...] We have here a beginning but we don’t have any answers. We don’t have a tree with fruit ripe on, for us to shake the fruit down.⁴⁹

⁴⁴ H.G. Wells *The World Set Free* [ebook version] (2012) [1914]. Available from <http://www.gutenberg.org/files/1059/1059-h/1059-h.htm>. Last accessed May 6 2015.

⁴⁵ Wells, *The World Set Free*, Chapter the Second, ‘The Last War’, Section 4.

⁴⁶ Weart, *Nuclear Fear*, p.26.

⁴⁷ Wells, *The World Set Free*, Chapter the Fourth, ‘The New Phase’, Section 11.

⁴⁸ On this theme and for broader discussions of how the ‘nuclear revolution’ – more specifically the advent of thermonuclear weapons – led ‘nuclear realists’ such as Gnder Anders, John Herz and Lewis Mumford to the assumption of incompatibility of nuclear weapons with existing institutions of international society, and to countenance radical transformation of global governance as a result, see van Munster and Sylvest, ‘Reclaiming nuclear politics?’; cf. Campbell Craig, *Glimmer of a New Leviathan* (Columbia: Columbia University Press, 2007).

⁴⁹ J. Robert Oppenheimer ‘Atomic Explosives’, 16 May 1946, in J. Robert Oppenheimer, *The Open Mind* (New York: Simon and Schuster, 1955) pp.5-7.

Considering the ‘problem’ of “‘The International Control of Atomic Energy’”, a term he described as ‘...a sort of code...a code because the real problem is the prevention of war’, J. Robert Oppenheimer (the ‘father’ of the atomic bomb) held on to the prospects for ‘beneficial applications’. And though Oppenheimer as scientist could clearly argue that his reading of the prospects for ‘beneficial uses’ would be more than just guesswork, he aligned his own thinking with the ‘widespread belief’ that, given the right conditions, ‘good things’ would come from nuclear power if placed in ‘the hands of intelligent and resourceful men’.⁵⁰

In relation to early attempts to construct an international nuclear order Oppenheimer’s utopianism is particularly significant, not least as he was a key voice informing the Acheson-Lilienthal report of March 1946.⁵¹ In turn those views largely underpinned the ultimately unsuccessful Baruch Plan and its proposal for an international Atomic Development Authority that would provide international ownership of ‘dangerous’ nuclear activities.⁵² In spite of the failure of the Baruch Plan, the sentiment of Oppenheimer’s relatively sanguine reflections on the potential for peaceful applications of atomic energy arguably remains as the bedrock of both historical and contemporary efforts to govern an international nuclear order. Underpinning Eisenhower’s subsequent ‘Atoms for Peace’ ideal was the certain assertion that:

It is not enough to take this weapon out of the hands of the soldiers. It must be put into the hands of those who will know how to strip its military casing and adapt it to the arts of peace. The United States knows that if the fearful trend of atomic military build up can be reversed, this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind. [...] That capability, already proved, is here – now – today. Who can doubt, if the entire body of the world’s scientists and engineers had adequate amounts of fissionable material with which to test and develop their ideas, that this capability would rapidly be transformed into universal, efficient, and economic usage?⁵³

The Atoms for Peace ideal, in Eisenhower’s framing at least, was not purely utopian in the common sense of that term. The ‘fearful trend’ of atomic military build-up was recognized by Eisenhower as a real and ongoing process rather than a remote dystopian nightmare; but so too were the ‘peaceful’ capacities of atom energy argued to be ‘no dream of the future’, they were ‘already proved’.⁵⁴

Making the world safe for the development of nuclear power?

Cynics, of course, have argued that Eisenhower’s ‘Atoms for Peace’ speech was effectively a kind of rhetorical subterfuge to ‘distract’ the world audience away from

⁵⁰ Ibid.

⁵¹ Secretary of State’s Committee on Atomic Energy, 16 March 1946 *Report on the International Control of Atomic Energy* [The Acheson-Lilienthal Report] p.1. Available at <http://www.learnworld.com/ZNW/LWText.Acheson-Lilienthal.html#page1>. Last accessed May 6 2015.

⁵² Randy Rydell, ‘Looking Back: Going for Baruch: The Nuclear Plan that Refused to Go Away’, *Arms Control Today*, 1 June 2006. Available at http://www.armscontrol.org/act/2006_06/LookingbackBaruch. Last accessed May 6 2015.

⁵³ Eisenhower, Address to the United Nations, 1953, np.

⁵⁴ Ibid.

the nuclearisation of NATO forces.⁵⁵ Regarding the more recent ‘renaissance’ of ‘[nuclear] disarmament politics’, in common with critics of the administration’s actual policies and progress Anne Harrington de Santana argued in 2011 that ‘While President Obama has placed a vision of a world free of nuclear weapons at the centre of his nuclear agenda, his administration has consistently prioritised agenda items that reduce nuclear danger through non-proliferation and arms control, rather than tackling the much tougher items that would form the basis for an effective practice of disarmament’.⁵⁶ Moreover, continuing investment in the stewardship and development of the US nuclear weapons stockpile has for many commentators and campaigners signalled the extent to which the Obama administration preaches nuclear disarmament but practices nuclear weapons retention.⁵⁷ The reflections of Sam Nunn - the former US senator and one of the ‘four horsemen’ argued to have initially influenced Obama - sum up the situation succinctly: ‘A lot of it is hard to explain. The president’s vision was a significant change in direction. But the process has preserved the status quo’.⁵⁸

As the actual progress and substantive degree of commitment to nuclear disarmament is called in to question, emphasis on the redeeming features of nuclear power become ever more important as a sustaining justification of political initiatives for international nuclear order. Mara Drogan’s assessment of Eisenhower’s ‘Atoms for Peace’ argues that it was not intended to be a disarmament measure but rather aimed to ‘blunt nuclear fears’ and the expansion of the ‘American nuclear project’ domestically and internationally.⁵⁹ Notably, the International Atomic Energy Agency (IAEA) continues to explicitly situate its mandate within, and as a continuation of, the original Atoms for Peace ideal as articulated by Eisenhower.⁶⁰ Even if IAEA Secretary General Yukia Amano has stated that ‘The IAEA does not encourage countries to use nuclear power, nor do we try to discourage them. It is up to each sovereign state to make its own decision’⁶¹, the statute of the IAEA identifies its role

⁵⁵ Martin J. Medhurst, ‘Atoms for Peace and Nuclear Hegemony: The Rhetorical Structure of a Cold War Campaign’, *Armed Forces and Society* 23, no. 4 (1997): 571-593.

⁵⁶ ‘The Strategy of Non-proliferation’, p.4; p.16. To substantiate the characterisation, Harrington de Santana contrasts the 2010 Nuclear Security Summit and the ‘New Start Treaty’ with Russia as prime examples of incremental progress on the control of nuclear materials and arms respectively with the relative paucity of progress or even emphasis on the Fissile Material Cut-off Treaty and the Comprehensive Treaty. The latter, she argues, would be ‘agreements that would actually fundamentally change the relationship of states to the physical embodiment of nuclear weapons’ – p.16.

⁵⁷ See, variously: Steven Young, ‘Obama’s Trillion Dollar Nuclear Weapons Gamble’, 1 February 2015. Available at <http://www.defenseone.com/ideas/2015/02/obamas-trillion-dollar-nuclear-weapons-gamble/104217/> Last accessed 5 May 2015; Global Zero: A World Without Nuclear Weapons, no date, ‘Obama’s Nuclear Weapons Spending Spree’, <http://www.globalzero.org/obamas-nuclear-weapons-spending-spreed> Last accessed 5 May 2015.

⁵⁸ As quoted in William J. Broad and David E. Sanger, ‘US Ramping Up Major Renewal in Nuclear Arms’, *The New York Times*, 21 September 2014 <http://www.nytimes.com/2014/09/22/us/us-ramping-up-major-renewal-in-nuclear-arms.html> Last accessed 5 May 2015.

⁵⁹ Mara Drogan, ‘Atoms for Peace, US foreign policy and the globalization of nuclear technology, 1953-1960’ (PhD diss., State University of New York at Albany, 2011) <http://gradworks.umi.com/34/87/3487479.html>. Last accessed 05 May 2015.

⁶⁰ See, for example, Yukia Amano (2014) Secretary General of the IAEA, ‘The IAEA and Atoms for Peace in the 21st Century’, 9 April 2014. Available at <http://www.iaea.org/newscenter/statements/2014/amsp2014n08.html>. Last accessed May 6 2015.

⁶¹ Amano, ‘The IAEA and Atoms for Peace in the 21st Century’, np.

as being to ‘...accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world [and to] ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose’.⁶² Likewise the agency’s mission states that ‘ [the IAEA] assists its Member States, in the context of social and economic goals, in planning for and using nuclear science and technology for various peaceful purposes, including the generation of electricity, and facilitates the transfer of such technology and knowledge in a sustainable manner to developing Member States’.⁶³

The latter formulations of the IAEA’s role suggest that rather than the potential ambivalence implied by Amano, the agency’s animating rationale remains making the world safe(r) for the development of nuclear power: by restraining the use of atomic energy for military ends and, simultaneously, preserving the space and scope for its development for peaceful purposes and benefits. The Treaty on the Non-Proliferation of Nuclear Weapons maintains essentially the same central diptych as its animating rationale:

Considering the devastation that would be visited upon all mankind by a nuclear war and the consequent need to make every effort to avert the danger of such a war and to take measures to safeguard the security of peoples [...]
Affirming the principle that the benefits of peaceful applications of nuclear technology, including any technological by-products which may be derived by nuclear-weapon States from the development of nuclear explosive devices, should be available for peaceful purposes to all Parties to the Treaty, whether nuclear-weapon or non-nuclear-weapon States.⁶⁴

Indeed, one way of reading the NPT is as an attempt to institutionalise Oppenheimer’s hope that peaceful uses and benefits of nuclear power could be used to incentivise a turn away from the temptation towards the construction and use of nuclear weapons - as a hallmark of this ‘grand enlightenment project’.⁶⁵ In principle at least, the in-built inequality of the treaty’s division between nuclear-weapon states and non-nuclear weapons states is offset not just by a commitment of all parties to the treaty to ‘pursue [nuclear disarmament] in good faith’ (Article VI) but also by the preservation and promise of scope for development of peaceful purposes of nuclear power. President Obama reiterated that logic in Prague in 2009 when he stated that:

The basic bargain is sound: Countries with nuclear weapons will move towards disarmament, countries without nuclear weapons will not acquire them, and all countries can access peaceful nuclear energy [...] We must harness the power of nuclear energy on behalf of our efforts to combat climate change, and to advance peace opportunity [sic] for all people (Obama 2009: np).

⁶² IAEA, ‘The Statute of the IAEA’, 1956, np. Available at <http://www.iaea.org/About/statute.html#A1.1>. Last accessed May 6 2015.

⁶³ IAEA, ‘The IAEA Mission Statement’, 2014, np. Available at <http://www.iaea.org/About/mission.html>. Last accessed May 6 2015.

⁶⁴ ‘Treaty on the Non-Proliferation of Nuclear Weapons’, p.1. Available at <http://www.iaea.org/Publications/Documents/Treaties/npt.html>. Last accessed May 6 2015.

⁶⁵ William Walker (2007) ‘Nuclear enlightenment and counter-enlightenment’, *International Affairs* 83 no.3 (2012): 431-453; p.432.

Each of the above visions of the international nuclear order is underpinned by nutopianism as identified previously: imbued with a spirit of technological optimism, but at the same time qualified by an awareness of the destructive uses and potentialities of nuclear power. More than this, though, there is an innately redemptive tone within such visions of international nuclear order. This nutopianism is not so crass as to suggest that ‘peaceful benefits’ or potentialities of nuclear power can in some way simply atone for the devastation caused by the use of nuclear weapons in war. Notably, for example, Secretary General Amano’s remarks on the 65th anniversary of the bombings of Hiroshima and Nagasaki mentioned ‘civilian nuclear programmes’ only in passing, and even then only as part of a movement by the IAEA to ‘redouble efforts’ to ensure that nuclear materials from civilian programmes are not ‘diverted’ to nuclear weapons production, or ‘[fall] into the hands of terrorist groups’. And these, Amano states, are sub-elements of his ‘personal commitment to redouble efforts towards a world free of nuclear weapons’.⁶⁶ Obama’s Prague Speech similarly places the ‘moral responsibility’ (emanating from Hiroshima and Nagasaki) on the elimination of nuclear weapons, in tandem with promotion of ‘peaceful [nuclear] power’: ‘...as a nuclear power, as the only nuclear power to have used a nuclear weapon, the United States has a moral responsibility to act. We cannot succeed in this endeavor alone, but we can lead it, we can start it’.⁶⁷

Nuclearism reconsidered

Given the assumptions of nutopianism, and in particular the assumption that a *nuclear-weapons-free* world does not, and indeed should not, be confused with the idea of an entirely *nuclear-power-free* world per se, it worth considering what an international nutopia might actually look like in more concrete terms. In this respect, Derek Abbott suggests that proponents of nuclear power (and those espousing nutopian visions necessarily are) should be subdivided further into ‘nuclear realists’ and ‘nuclear utopians’.⁶⁸ ‘A nuclear realist suggests something on the order of 1 terawatt of nuclear power as part of the global energy mix, providing security in terms of energy diversity and reduced carbon emission’⁶⁹, whereas ‘A nuclear utopian’, by way of contrast in Abbot’s view, ‘goes much further and suggests that nuclear power can potentially supply the bulk of the world’s energy needs for many thousands of years to come and that perhaps a mix of renewables with nuclear power as the backbone supply is the long-term energy future’.⁷⁰ Particularly in the context of ever-increasing energy needs and a global climatic change, ‘If the utopian vision is a valid one’, Abbott argues, ‘then it provides considerable impetus to pull together and solve

⁶⁶ Yukia Amano Secretary General of the IAEA, ‘Statement on Anniversary of the Hiroshima and Nagasaki Bombings’, 6 August 2010, np. Available at <http://www.iaea.org/newscenter/statements/2010/amsp2010n014.html>. Last accessed May 6 2015.

⁶⁷ ‘Remarks by President Barack Obama, Hradcany Square, Czech Republic’, 2009, np.

⁶⁸ Derek Abbott (2012), ‘Limits to Growth: Can nuclear power supply the world’s needs?’, *Bulletin of the Atomic Scientists* 68 no.5 (2012): 23-32.

⁶⁹ As an exemplar, Abbott cites Barry W. Brook, ‘Could nuclear fission energy, etc., solve the greenhouse problem? The affirmative case’, *Energy Policy* 42:?, (2012):4-8.

⁷⁰ Abbott, ‘Limits to Growth’, p.23. Abbott cites, as an exemplar of such ‘utopianism’, Wallace Manheimer, ‘Can fission and fusion breeding help civilization survive?’, *Journal of Fusion Energy* 25, nos.3-4 (2006): 121-139.

the various practical, safety, and economic problems that currently limit the rapid expansion of nuclear power'.⁷¹

Yet Abbott's assessment suggests caution about the prospects for 'scaling up' the current use of nuclear power. His 'generous estimates' put global power consumption at a figure of about 15 terawatts; meeting that consumption solely via nuclear power would, he argues, require scaling up from the current global figure of about 430 commercial nuclear reactors worldwide to approximately 15,000 reactors. At such levels the pressures of scaling up to a 'nuclear utopia' would, Abbott contends, run into a series of practical limiting factors: of site selection (the availability of suitable sites would be limited, in terms of, for example, access to coolant water, and co-locating reactor sites would increase the risk of common-mode failures); metal degradation in reactor vessels (the extent and rate of which may be difficult to determine with precision; the corresponding increase in production of nuclear waste); increased potential for accidents given the higher number of reactors in operation; and diminishing global supplies of uranium as well as other vital materials and elements required in the construction and operation of nuclear reactors.⁷²

To this list Abbott also factors in the concern that, even in spite of on-going efforts to create 'proliferation resistant' reactors and fuel cycles, 'With a scale up to 15,000 reactors worldwide, it would be nearly impossible to keep track of all fissile materials', especially given that it '...is already challenging for today's relatively small nuclear industry to provide assurance that materials have not been diverted for weapons'. Even with regard to nuclear fusion reactors (as opposed to fission, for which Abbott primarily identifies the limits above), Abbott remains highly sceptical both over the prospects for the technology and, more particularly its scalability. The risk of 'diversion' of materials into weapons production also remains as 'deuterium used in heavy-water reactors and fusion reactors, at large volume, is cause for concern as it can be used to make lithium-6 deuteride thermonuclear warheads'.⁷³

As Abbott himself acknowledges, the scenarios envisaged above are based on the most 'utopian' variant of nuclear advocacy and a corresponding full scale 'nuclear renaissance'. Abbott uses the hypothetical scenario, though, to raise questions that are pertinent even to more 'realistic' advocacy of the expansion of nuclear power.⁷⁴ This suggests that the 'peaceful purposes' argument in relation to utopian visions of international order, often framed in terms of the redeeming features of nuclear power, is less straightforward than utopianism assumes and opens up space for corresponding reconsideration of 'nuclearism' and the scope of nuclear critique in international studies. The work of David Krieger is potentially distinctive in this regard. He too employs the concept of 'nuclearism', but in a way that conceives of critique of nuclear power in a more holistic sense than originally articulated by Lifton and Falk. 'Nuclearism', on Krieger's understanding, '...is the belief that nuclear weapons and nuclear power are essential forms of progress that in the right hands will

⁷¹ 'Limits to Growth', p.24.

⁷² Abbott, 'Limits to Growth', pp.24-28.

⁷³ 'Limits to Growth', p.26; p.28.

⁷⁴ Cf. Matthew Fuhrmann, *How 'Atoms for Peace' Programs Cause Nuclear Insecurity* (Ithaca, NY: Cornell University Press, 2012).

protect peace and further the human condition'.⁷⁵ In a more expansive concern with the 'dangers' of *both* nuclear weapons and 'peaceful' nuclear power, Krieger argues that 'Believers in nuclearism, to the extent that they acknowledge these dangers, argue that nuclear technology brings benefits that more than compensate for its dangers'. Nuclearism, on this rendering, is dependent on maintaining an 'artificial boundary between military and so-called peaceful uses of nuclear energy'. That artificiality, Krieger argues, can and should be challenged.⁷⁶ And in terms of current visions of the international nuclear order (and visions of its future), the implications of this line of argument are challenging and far-reaching. The 'inalienable right' to 'peaceful' nuclear power as embodied in the logic of the NPT and the purpose of the IAEA is, Krieger's argument suggests, a constitutive part of the problem of international nuclear order, a 'recipe for chaos'⁷⁷ rather than an incentivising solution.

Creation of international nuclear order, on this reading, is a much more fundamentally challenging problem if and when a strict distinction between peaceful/civil/constructive nuclear power and belligerent/military/destructive nuclear power is called into question. Indeed there is even evidence to suggest that discussions of 'nuclearism' by the term's original authors have more recently evolved in this direction towards consideration of a more inclusive focus on the interfaces between 'civil' and 'military' nuclear power. This specific point has been raised more recently in Richard Falk's remarks (in dialogue with Krieger):

I suppose [...] in terms of both avoiding disastrous Fukushima-like events and facilitating acquisition of the weaponry [...] The question we need to address is whether the quest for nuclear disarmament is properly separated from issues bearing on the viability and desirability of nuclear energy or whether nuclear disarmament cannot go forward unless the pursuit of nuclear energy is also renounced.⁷⁸

Most fundamentally, the potential for both production and use of enriched Uranium (U-235) in and by 'civil' nuclear infrastructures, or Plutonium 239 (Pu-239) as a by-product of fissioning of uranium, are constitutive of the problems that the current international nuclear order both sustains and seeks to contain. Krieger, building from Falk's reflections on 'The question we need to address...' above, articulates a response that constitutes, effectively, an imminent critique of the contemporary international nuclear order: 'It is highly ironic that the Non-Proliferation Treaty describes peaceful uses of nuclear energy, which would include power generation, as an "inalienable right." This means that in a very real way, the treaty works against one of its principal objectives, that is, preventing nuclear weapons proliferation'. Engaging a critique of the utopian underpinnings of the NPT Krieger notes that he '[has] always thought that the NPT lacked appropriate caution in its characterization

⁷⁵ David Krieger, 'Nuclearism and its Insecurities' in Majid Tehranian (ed.) *Worlds Apart: Human Security and Global Governance* (London: I.B. Tauris, 1999) pp.109-124, p.109.

⁷⁶ Krieger, 'Nuclearism and its Insecurities', p.114.

⁷⁷ Alice Slater, 'The inalienable right to peaceful nuclear power: A recipe for chaos' in Richard Falk and David Krieger (eds.) *At the Nuclear Precipice: Catastrophe or Transformation* (London: Palgrave, 2008), pp.57-66.

⁷⁸ Falk in Richard Falk and David Krieger, *The Path to Zero: Dialogues on Nuclear Dangers* (Boulder, CO: Paradigm, 2012) p.103.

and encouragement of nuclear energy programmes'.⁷⁹ He even goes so far as to endorse the contention that the most effective (even though he characterises it as 'unlikely') constraint on proliferation risks would be a complete 'phase-out' of civilian nuclear energy.

Krieger's re-definition of the scope and of 'nuclearism', and of critique of it, stands as an invitation to characterise the 'insecurities' and 'dangers' of the nuclear age in much more expansive terms. Indeed Krieger at times seems to rule out the very possibility of clear distinction or dividing line between 'civil' and 'military' nuclear power. Instead, his framing of the insecurities of the 'nuclear age' imagines a spectrum of nuclear dangers that inherently overlap with and bleed into one another. Thus, as he puts it, one of the 'great challenges of our time' is to 'eliminate technologies that put the future of humanity at risk of annihilation or create an enduring legacy of poisonous materials that cannot be adequately contained and prevented from causing harm to countless future generations'.⁸⁰

And yet, the direct (from Falk) and indirect (from Lifton) reflections from the originators of the term and debate on nuclearism suggests a degree of reticence on their part as to this potentially more expansive form of nuclear critique. Falk at times seems highly sympathetic to Krieger's arguments: 'Nuclear weaponry is genocidal in its tendency, if not omnicidal and ecocidal, while nuclear power is a hubristic toss of the dice that could at some future times release lethal radiation in massive doses severely harmful to health and societal security'.⁸¹ Elsewhere, though, he wonders:

...If the proliferation risks arising from nuclear reactors could be minimized, should the objections of those of us advocating nuclear disarmament and demilitarization be dropped? In a central sense, this question asks whether under some, but not all, circumstances, nuclear disarmament is separable from the debate on the future of nuclear energy. And finally, supposing that nuclear power development continues as before Fukushima, does it modify our thinking about nuclear disarmament and, more generally, military uses of nuclear weapons? If so, in what ways?⁸²

In the above, Falk in effect poses a series of questions to the more expansive form of nuclear critique advocated by Krieger and in the latter's redefinition of nuclearism. Though he is sympathetic, Falk's line of questioning suggests uncertainty about the latter approach. Notably, it is predicated on a lingering hope that 'If the proliferation risks arising from nuclear reactors could be minimized...'; in other words, Falk suggests the residual prospect that both technological and political means can be found to create and shore up (both literally and figuratively) a division between nuclear power for energy generation on the one hand and nuclear power for weaponry on the other.

⁷⁹ Krieger, in Falk and Krieger, *Dialogues on Nuclear Dangers*, p.104.

⁸⁰ Krieger, in Falk and Krieger, *Dialogues on Nuclear Dangers*, p.119.

⁸¹ Falk, in Falk and Krieger, *Dialogues on Nuclear Dangers*, p.120.

⁸² Falk, in Falk and Krieger, *Dialogues on Nuclear Dangers*, p.111.

Conclusion

Robert Jay Lifton, for his part, has also expressed a concern that a more expansive and holistic form of nuclear critique along the lines suggested by Krieger might lead to facile equivalence of 'Fukushima and Hiroshima'. No-one should be left in any doubt, Lifton asserts, that even in the wake of Fukushima 'it is nuclear weapons that most endanger mankind'. But he goes on to argue that:

...pro-nuclear power forces could prevail only by managing to instill [sic] in the minds of Japanese people a dichotomy between the physics of nuclear power and that of nuclear weapons, an illusory distinction made not only in Japan but throughout the world [...] There is also the hope (and here the sameness of the technology is recognized) that something peaceful can be derived from the awesome, world-destroying nuclear deity; that we humans who commissioned and built the weapons can somehow find redemption in that same ultimate technology.⁸³

Noting how Lifton's reflections return us to the theme of 'redemption', critical international studies might do well to reflect on the role that redemptive hopes and utopian understandings of nuclear power continue to play in contemporary programmes for (and reform of) international nuclear order. As illustrated above, such programmes are often crucially predicated on a common sense distinction between 'peaceful' (or civil energy generation) and 'military' (weapons) forms of nuclear power. However debates over whether the 'peaceful atom' is as straightforwardly benign as many proposals for international order assume lead to a question as to whether the scope of nuclear critique within international studies should be correspondingly expanded.

More recent debates on 'nuclearism' consider the potential for more expansive understandings of nuclearism to open to the scope out beyond nuclear weapons (as object of critique) and disarmament (as a normative and political goal). But they also provisionally point to a degree of reticence and uncertainty as to whether a more expansive critique of nuclearism might risk diluting the force of a more discrete concern with disarmament and critique of nuclear weapons. The evolution of debates on nuclearism suggest a complex process of navigation between critique of hard and fast distinctions between 'civil' and 'military' nuclear power on the one hand, and flattening of distinctions between different types of nuclear dangers on the other hand. Doing so undoubtedly opens up a series of complex questions: thinking about nuclear insecurities as an interconnected spectrum that captures issues usually subdivided into 'peaceful' and 'military' purposes is much more challenging than treating nuclear weapons as the sole problem to be solved. But critical reflection on the common sense utopian underpinnings of proposals for international nuclear order might at the very least provide a better starting point from which to appraise the multifaceted insecurities of the nuclear age.

⁸³ Lifton, 'Fukushima and Hiroshima', np.