AUTONOMOUS WEAPONS AND NUCLEAR DETERRENCE: CONCEPTUALIZING POLICY FOR REVOLUTIONARY WEAPONS

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ABSTRACT

Autonomous weapons have gone from relative obscurity to a hotly debated topic within a space of just several years since first being discussed in a United Nations disarmament forum in 2013. Despite the recent academic surge in interest of autonomous weapons, the debates have largely been confined to specific ethical and legal questions, mostly conducted between opponents and lobbyist supporters of autonomous weapons. This thesis seeks to address the deficiency by attempting to historicize the current debate surrounding autonomous weapons and academically inquire into the role autonomous weapons might play in international relations. To that end, autonomous weapons are seen as continuing in a historical trend of adopting modern technology and the concomitant knowledge production that such innovations bring along. The historical process of developing nuclear policy is shown to serve as a template for discussions on autonomous weapons. To the extent that weapons with autonomous structures will become technologically possible, the debate on autonomous weapons has been conducted with a framework already in existence due to nuclear weapons policy. The attempt of the limited IR and strategic scholarship is progressing along similar lines as that of nuclear weapons. Understanding nuclear strategy is thus essential to predicting the role autonomous weapons will play in future military doctrine.

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nejtěžších momentech.

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INTRODUCTION

In debates about technology, the assertion that technological systems and artificial objects could have certain intrinsic political properties remains a controversial and oft-dismissed notion.[1] The idea that inanimate objects acquire agency independent of their human creators is an old one, with some accounts tracing the modern fear and fascination with machines-out-of-control as far back as the 16th century to the Jewish tale of the Golem.[2] Mary Shelley's *Frankenstein*, to take a popular example, has become a short-hand for a wide array of ills and effects associated with technological progress, often used to warn against the perils of unchecked invention. Yet even in Shelley's novel, Dr. Frankenstein's creation anthropomorphises, and is akin more to a failed cloning project rather than a whole-sale diktat by technological *things*. That technology has influenced individuals and societies alike, and even enabled political change – as in the case of the printing-press for example – is to state the obvious, an observation that can be found in any standard history text book. Yet to "discover either virtues or evils in aggregates of steel, plastic, transistors, integrated circuits, and chemicals seems just plain wrong, a way of mystifying human artifice and of avoiding the… human sources of freedom and oppression, justice and injustice."[3] On the surface, such statements appear as crude technological determinisms that warrant dismissal or, in the least, a corrective clause clarifying that it is social forces behind these artifices that really matter. A milder version of technological determinism has been expressed many times in history. Hannah Arendt and Herbert Marcuse both observed that technology had to some extent become an

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[1] In recent years, debates on technology in general, and automation in particular, have received a considerable amount of scholarly and popular attention. For a systematic analysis of the impact of modern technologies on the economic and social areas of human life, see Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York; London: W. W. Norton & Company, 2016).

[2] Moshe Idel, *Golem: Jewish Magical and Mystical Traditions on the Artificial Anthropoid* (Albany, N.Y: State University of New York, 1990).

[3] Langdon Winner, "Do Artifacts Have Politics?," *Daedalus* 109, no. 1 (1980): 122.

oppressive and independent force hostile to individuals. Non-the-less they believed that under different social arrangements, it can become a force for good.[4] Intellectuals and critics of technology such as Jacque Ellul and Lewis Mumford went even further, arguing that technology had become a force in and of itself, asserting control over human societies. "Man" according to Ellul, "has become tecnomorphic."[5]

Certainly, ideas that "men know best what they have made" or that "technology is neutral, merely a means to an end" have come under increased scrutiny. Taking the Marxist notion that the way "men produce their means of subsistence depends first of all on the nature of the actual means of subsistence they find in existence and have to reproduce,"[6] the thought can be extended not just to material objects, but the accompanying systems of production that such reproduction of the means of subsistence requires. What this statement implies is that once certain systems of production are in place, they achieve a certain momentum which moulds or favours certain types of behaviours over others, provided societies are to go on living in a technological world. The key point here is to take technical products and material seriously, rather than apply reductionist principles and view all socio-political events as having strictly anthropomorphic causes.[7] Rather than developing a political theory of technology, it is necessary to add the technological element to existing social analyses of politics.

Technological progress and modernity have been synonymous for at least a century, to the extent that technological progress has become the only *progress*.[8] While questions regarding the teleology of technology have been around at least since the industrial revolution, the radical development of robotic and machinic intelligence, and calculating capacity, that has

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[4] For Arendt this was through political action, for Marcuse through individual self-realization.
[5] Jacques Ellul and Robert K. Merton, *The Technological Society*, trans. John Wilkinson, Extensive Underlining edition (New York, NY: Vintage Books, 1964).
[6] Karl Marx and Friedrich Engels, *The German Ideology, Including Theses on Feuerbach* (Amherst, NY: Prometheus Books, 1998), 8.
[7] Winner, "Do Artifacts Have Politics," 123.
[8] Howard P. Segal, *Technology and Utopia* (Society for the History of Technology, 2006).

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occurred in the last several decades brings forward the question: to what extent is technological progress the wilful expression of human creativity and not a mere autonomous process over which human beings no longer wield any meaningful control? In the context of the 21st century, where nearly a half of all human jobs are susceptible to automation in the near future, how does the conception of human agency, indeed the very essence of what it means to be human, change?[9] This thesis will attempt to go beyond the crudely deterministic explanations of technology, while avoiding the pitfalls of treating technological creation as incidental and tool-like, to be used by humans in whatever way they wish. It is important to note and analyse ways in which certain technological devices might be "designed and built in such a way that it produces a set of consequences logically and temporally *prior* to any of its professed uses."[10] The starting point from a system-wide analysis is Langdon Winner's *Autonomous Technology: Technics-Out-Of-Control As a Theme in Political Thought* (1977) that rather convincingly illustrates that the (Western) idea of the absolute human mastery over technology is based on considerably outdated notions of what modern technology is, and furthermore seems to warrant a dangerous set of assumptions about our ability to shape the world to human, as opposed to system, needs.[11]

Nuclear weapons are one such technological artifice that given their immense destructive potential have a significant impact on the shape of both the domestic society in which they are developed, and the behaviour and structure of other societies that respond to such developments. The most pertinent example of such methodological inquiry into the implications of nuclear weapons is documented in Eric Schlosser's *Command and Control:*

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[9] For the potential of automation see "The Third Great Wave," *The Economist*, 3 October 2014, http://www.economist.com/news/special-report/21621156-first-two-industrial-revolutions-inflicted-plenty-pain-ultimately-benefited; and Brynjolfsson and McAfee, *The Second Machine Age*.

[10] Winner, "Do Artifacts Have Politics," 126.

[11] Langdon Winner, *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought* (Cambridge, Mass.: The MIT Press, 1978). Chapter 7, *Complexity and Loss of Agency*, summarizes the problem.

Nuclear Weapons, the Damascus Accident, and the Illusion of Safety (2013). Schlosser spends much of the book meticulously detailing the accidents and errors that have occurred in the American nuclear arsenal from its dawn in the Manhattan Project to the present day. While most of Schlosser's work is dedicated to the Damascus Titan Missile Silo explosion and numerous other less known accidents, Schlosser's conclusion about the command and control systems of American nuclear weapons are far reaching and consequential. Pointing to numerous instances when a minor, often unrelated incident initiated a sequence of potentially nuclear triggering events that eventually eclipsed all human ability to act contrary to the logic of pre-planned nuclear action scenarios, Schlosser shows the reader the perils of believing that humans necessarily possess the knowledge or ability to control a nuclear stand-off.[12] Moreover, with state's and their militaries increasingly fielding what is now commonly referred to as autonomous weapon systems (AWS) within their command and control structures, concern with how autonomous technology changes human behaviour and the international system becomes ever more pressing.[13]

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[12] To illustrate a typical example from the book: At the height of the Cuban Missile Crisis, a U2 spy plane was conducting routine sample collections in international airspace over the Arctic Circle, searching for evidence of Soviet nuclear tests. While on its way back to Anchorage, the plane's navigation systems malfunctioned, and the pilot soon found himself in the middle of the Soviet Union, in Siberia, pursued by two Soviet interceptors. Attempting to remedy the situation, the pilot headed toward Alaska, hoping to get air cover from US jets over the Barents Sea. Having made it there, with Soviet planes on his tail, the U2 was reinforced by US interceptors who engaged the Soviet aircraft. Given the circumstances of the time, a dog fight with conventional weapons between the two groups of aircraft could have potentially been extremely dangerous on its own. There was, however, a further, unanticipated element. Under the DEFCON 3 conditions, American jets were equipped and authorized to use their atomic antiaircraft weapons to halt the Soviet planes. A potential skirmish between half-a dozen planes over Alaska could have resulted in the use nuclear weapons, at a time when such a use would likely trigger a nuclear exchange. No one could possibly proscribe a human intention or agency to this chain of seemingly unlikely events, particularly as the episode began with a malfunctioning navigational equipment caused by artic conditions. See Eric Schlosser, *Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety (*New York: Penguin Books, 2014), 286.

[13] Stanley Kubrick, *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb*, Comedy, War, 1964, http://www.imdb.com/title/tt0057012/; John Badham, *WarGames*, Sci-Fi, Thriller, 1983, http://www.imdb.com/title/tt0086567/. Such automatic technologies were depicted in the famous 1983 science-fiction movie *Wargames* in which a young student 'hacks' into an early warning system of the US Strategic Air Command and almost sparks a nuclear confrontation with the Soviet Union. A more famous predecessor of such genre was Stanley Kubrick's *Dr. Strangelove*, where a series of unforeseen events, complex automated technologies and an element of human madness in the American military sparks a nuclear exchange between the two superpowers. Seen as satirical pieces and dire warnings at the time, both events

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Termed by some observers as a third revolutionary development in warfare after gunpowder and the atomic bomb, AWS have the potential to significantly alter the international security landscape as much as nuclear weapons have in the mid-20th century. Though the connection between nuclear and autonomous weapons is not immediately clear, this thesis will argue that the intellectual and policy underpinnings of nuclear weapons have a direct relevance to the issue of autonomous weapon systems. Just as it is unimaginable that a direct engagement between two nuclear superpowers would not escalate into thermonuclear war, it will become unthinkable that states armed with autonomous weapons will not deploy them.[14] As nuclear weapons – and in fact most technological innovations – rarely receive a comprehensive evaluation from international relations scholars, one of the tasks of this thesis will be to establish technology as an agent with politics in its own right. By using one historically revolutionary technology – nuclear weapons – and using the template acquired from that study to evaluate an upcoming game-changing weapon's technology – autonomous weapons – this thesis will seek to illustrate the effects that knowledge production surrounding technology has on international relations. Rather than viewing early development and implementation of any new technology as being neutral – produced and fitted into a human-centric utility model – or purely deterministic, this thesis will seek to illustrate the contingent nature of human understanding of technological change. Throughout the thesis the argument that technologies themselves can shape human behaviour and socio-political interactions and then begin to transform society towards ends initially unforeseen by the creators themselves, will be evident, yet its human aspect of *how* this is precisely understood will be explored in the greatest detail.

were in fact, rather unconsciously, accurate depictions of events that almost initiated a nuclear war between the United States and the Soviet Union.

[14] Nina Tannenwald identified several normative factors that made nuclear weapons use unlikely, an outright taboo as Tannenwald writes. No such taboo exists with regards to autonomous weapons, and given their more diffuse and less spectacular nature, such taboo seems unlikely to emerge. Nina Tannenwald, "Stigmatizing the Bomb: Origins of the Nuclear Taboo," *International Security* 29, no. 4 (2005): 5-49.

The crucial part, however, is the *view* of these technologies as game-changing, and as warranting a different strategic approach. Technologies of any sort do not exist independently of their human understanding. While technologies in and of themselves may induce and preclude certain practices, the limits and opportunities are often subject to intense intellectual and policy debates. No technology is revolutionary unless someone believes it to be so and manages to generate knowledge that is than accepted as "common sense." It is the knowledge production surrounding autonomous and nuclear weapons that will be the subject of this thesis. The first chapter of this thesis will attempt to illuminate the basic premises now discussed among those concerned with autonomous weapons, as well as basic technological and sociological facts established in the discourse on autonomous weapons. The second chapter will examine one of the main technologies that have affected international relations: nuclear weapons. By understanding and illustrating the changing nature of nuclear strategy throughout the Cold War, a framework for understanding revolutionary technological invention will be developed. Through the study of nuclear weapons, this thesis will attempt to extract a workable framework from the knowledge production of nuclear strategy and adapt it for use as a tool to predict and theorize the debate currently underway regarding autonomous weapons. In light of the two chapters, chapter three will attempt to apply the information discovered from nuclear strategy and draw parallels between the changing discourse and theorization of nuclear weapons and those of autonomous weapons.

1. THE AUTONOMOUS WEAPONS DEBATE

Autonomous weapon systems (AWS) have been on the agenda of academics, activists and policy makers for several years. Much of the current intellectual and policy research into autonomous weapons has focused on the legal and ethical implications of developing, deploying and accounting for AWS.

It is common place to insist that a clear and working definition of autonomous weapons does not exist, a statement that is often accompanied by the unwillingness of states and supporters of autonomous weapons to move further in AWS-related discussions. Expecting a dictionary-styled definition of a weapon system that is multifaceted, networked, and most importantly still under development is asking for the impossible. Working definitions of what an autonomous system *is* are therefore focused on what it can *do*. NGOs involved with the issue all use roughly the same definition of AWS as "fully autonomous weapons that can select and attack targets without meaningful human control over individual attacks."[15] States tend to use exclusionary definitions, where anything short of the infamous *Terminator* is deemed as not falling under the category of autonomous weapons.[16] The only meaningful distinction that can be made is between weapons that are autonomous and those that are merely *automated*.[17] There already exists a full spectrum of weapons that are automated but not autonomous, in so far as they are solitary weapons with an extremely narrow set of parameters of engagement and theatre of operation. Examples of such automated weapons include the MIM-104 Patriot missile defense system, the SeaRAM anti-ship missile defense system, or the Phalanx fast-

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[15] Stepan Denk and Daan Kayser, "Keeping Control: European Positions on Lethal Autonomous Weapon Systems," (PAX Netherlands, October 2017), https://www.paxforpeace.nl/publications/all-publications/keeping-control.

[16] See "Keeping Control" for definitions that many European states use and its critique by NGOs.

[17] Jeffrey Bradshaw et al., "The Seven Deadly Myths of 'Autonomous Systems," Intelligent Systems, *IEEE* 28 (1 May, 2013): 54–61, https://doi.org/10.1109/MIS.2013.70.

reaction gun system.[18] Most of these weapons remain defensive in nature and can therefore be hardly described as the kind of offensive and versatile weaponry that is the subject of this paper. None the less, a considerable amount of these weapons remain in a grey zone, especially as they form what is known as "legacy," or precursor systems, to the AWS that many militaries and contractors are currently developing.[19]

The extent to which autonomous weapons are becoming a reality is difficult to ascertain from public sources, as most research and development that specifies any platform's capability is kept secret. There are however key features for which states pursue autonomy in weapons, and certain prerequisites for the technologists bringing AWS to life. First is the ability to distinguish between certain groups of targets, say, for example, between a soldier and a farmer with a pitchfork, or a tank and a school bus. This requirement is crucial so as to make any weapon a sensible military investment, as mistakes will be of greater consequence given that the deployment of AWS is ostensibly made partially on the grounds of it making *fewer* mistakes than human operated counterparts. Secondly, the ability of AWS to develop their own strategies and ways of functioning will be of significant importance to those who employ such systems. Since one of the goals of AWS development is to make such weapons both hard to counter and be able to act at superhuman speeds, decision-making of an AWS's software has to be both independent and unpredictable, so as to prevent any interception or prediction.[20] A fundamental

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[18] For an overview see Paul Scharre, *Army of None: Autonomous Weapons and the Future of War* (New York: W. W. Norton & Company, 2018); and Peter W. Singer, *Wired for War: The Robotics Revolution and Conflict in the 21st Century* (New York, NY: Penguin Books, 2009).

[19] Mark Gubrud, "Semi-Autonomous and on Their Own: Killer Robots in Plato's Cave," *Bulletin of the Atomic Scientists,* 12 April 2015, http://thebulletin.org/semi-autonomous-and-their-own-killer-robots-plato%E2%80%99s-cave8199.

[20] Bruce T. Clough, "Metrics, schmetrics! How the heck do you determine a UAV's autonomy anyway?" In Proceedings of the Performance Metrics for Intelligent Systems (PerMIS) Conference, (August 2002): Gaithersburg, MD.

Achilles heel of any large-scale system is to ensure its smooth operation while retaining control; a problem that historically seems to favour effective operation.[21]

1.1 Law and Ethics of Autonomous Weapons

The largest academic headway into autonomous weapons has occurred in the realm of law and ethics. Articles, books, editorial pieces, and popular publications have dealt extensively as to how the procedural development and adoption of autonomous weapons might impact the existing international humanitarian law, with a particular focus on the legality and responsibility of combat deployment of an autonomous weapon.

Much of the current debate is centred around the developments at the Convention on Certain Conventional Weapons (CCW) which has been debating the issue of autonomous weapons since 2013. While this is primarily a state-centred forum for debate, the CCW's meeting on lethal autonomous weapon systems does give space to a number of non-governmental organisations and outside experts. The main opponents of AWS are largely concentrated under the NGO umbrella coalition of the Stop Killer Robots Campaign (KRC)[22] who are attempting to mount a legal challenge through both national and international avenues. The ultimate gaol of the campaign is to seek an international ban in the form of an Additional Protocol to the CCW that would explicitly ban autonomous weaponry.[23] Those not intrinsically opposed to the idea of developing or deploying AWS focus mostly on the ability of any autonomous systems to comply with current International Humanitarian Law (IHL) and seek ways to address particular legal issues rather than calling for an outright ban.[24]

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[21] See Charles Perrow, *Normal Accidents: Living with High-Risk Technologies* (Princeton, NJ: Princeton University Press, 1999); Charles Perrow, "Nuclear Denial: From Hiroshima to Fukushima," *Bulletin of the Atomic Scientists* 69, no. 5 (1 September 2013): 56–67, https://doi.org/10.1177/0096340213501369.

[22] See the Stop Killer Robots Campaign website, https://www.stopkillerrobots.org.

[23] See for example Bonnie Docherty, "Losing control: The dangers of killer robot," *Human Rights Watch*, 16 June, 2016, https://www.hrw.org/news/2016/06/16/losing-control-dangers-killer-robot.

[24] Paul Scharre and Kelley Sayler, "Autonomous Weapons and Human Control," *Center for New American Security*, April 07, 2016, https://www.cnas.org/publications/reports/autonomous-weapons-and-human-control.

KRC and those politically affiliated with them argue that much of current legal practice precludes the deployment of weapons outside of human control due to issues of attribution, proportionality of attacks, distinction between combatant and civilian, and generic assessments of military necessity. Furthermore, important question were raised by military lawyers as to the ability of an autonomous weapon system to distinguish between an active combatant, and a surrendering one, and whether such weapons could in principle be subject of laws of war, an often cited prerequisite for their deployment.[25] Proponents often argue that so long as a machine is better at applying humanitarian law than humans, the question of their legality is a moot point. While debates surrounding the lawful deployment or even development of AWS is still ongoing and largely subject to the technical specificities of any one machine in question, the ethical side is rather clear cut.

Ethical considerations regarding the use of AWS mostly boil down to a question of whether it would be morally acceptable to relegate the question of life and death to a machine, with minimal or no human input. The moral opposition to such development has come mostly from religious organisation, in international fora represented by the voice of the Holy See, and a handful of other states vary of such a development.[26] While a normative question at heart, this ethical issue is often framed as one of efficiency: if machines can kill more humanely and efficiently than their human counterparts, it is ethical to employ them.[27]

1.2   *Autonomous Weapons and the International Order*

Both of these debates form the bulk of research on the subject, to the detriment of other aspects that seem to be more pertinent to this stage of technical development of autonomous

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[25] For a summary of these points see Peter Asaro, "On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-Making," *International Review of the Red Cross* 94, no. 886 (30 June 2012): 687–709, https://doi.org/doi:10.1017/S1816383112000768.
[26] See Denk and Kayser, "Keeping Control: European Positions on Lethal Autonomous Weapon Systems."
[27] See Asaro, "On Banning Autonomous Weapon Systems."

weapons. This includes the topic with which many policy makers view the issue through – that of strategic stability.[28] As artificial intelligence moves beyond an eye-catching headline to practical application, those in positions of power concerned with effect such new weaponry will have are going to have to assess its implication on their own strategy, arsenals – both their own and their adversaries – and strategic implications.

On the issue of autonomous weapons and their implication on the current strategic environment, only two papers have thus far been published. One of them is Jurgen Altmann's and Frank Sauer's "Autonomous Weapon Systems and Strategic Stability," a paper that deals most comprehensively with the issue of AWS effect on strategic level thinking. One of the key insights the paper works with is how the lessons of the Cold War are not just informative but guiding vis a vis AWS. Specifically, the issue of arms race and crisis instability is seen as a key to understanding modern AWS, with Cold War era technology, such as MIRVs ABM systems, seen as illustrative of the developing security dilemma.[29] For the authors, AWS, particularly in their saturating, micro-drone swarming variations will increase incentives for striking first in much the same way that certain technologies of the nuclear cold War were deemed to be first strike incentivizing. Moreover, the author's emphasize, the speed with which AWS could engage in warfare, moving even beyond the time limits imposed by hair-trigger alert nuclear weapons. Incentives for delegating certain pre-assigned decision to autonomous systems might seem compelling, especially as nuclear weapons and command and control systems are deemed to be at risk from conventional capabilities.[30] The authors conclude that to solve this dilemma or conventional AWS threatening strategic stability (which they implicitly see as *nuclear strategic stability*) a ban on AWS is needed.

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[28] For the observation of how overlooked this topic has been see Jürgen Altmann and Frank Sauer, "Autonomous Weapon Systems and Strategic Stability," *Survival* 59, no. 5 (3 September 2017): 118–121, https://doi.org/10.1080/00396338.2017.1375263.

[29] Altmann and Sauer, "Autonomous Weapon Systems and Strategic Stability," 120-122.

[30] Altmann and Sauer, "Autonomous Weapon Systems and Strategic Stability," 131.

The second piece authored by Nathan Leys delves into the technical details of why strategic stability might be at risk from AWS particularly in instances when command and control (C2) is severed (on purpose or due to enemy action).[31] This sort of thinking is evident in many DARPA/Pentagon projects that want swarming AWS capability in "denied environments." Describing such weapons as second-strike deterrents of the Cold War (and one should add the present) era, AWS would fulfil a similar function of being able to strike even after much of the current infrastructure has been destroyed, taking on a sort of mutually assured destruction role with an uncomfortable hint of Doomsday Device with it. For Leys, the most important element is the unpredictability of interacting AWS, where the military benefit is making it as disconnected with C2 and as unpredictable so to cut weakness and surprise an enemy AWS.[32] There is an added bonus on unpredictability, something that Leys sees as hardly fostering strategic stability if these weapons are deployed in the hair trigger system that they might be deployed in. The central point for Ley's concerns crisis management, and how to effectively deal with AWS that have been deployed after C2 has been severed.[33] What is crucial, Leys contends, is how to effectively deploy AWS without compromising diplomatic and political efforts that could be hampered by autonomously operating weapons, without a clear way to be recalled.

What is interesting is how they take many concepts and ideas for granted, applying those that have already been in use to a new category of weapon that they admit is game changing. To the extent that autonomous weapons can be called the third revolution in warfare (as some have posited), the associated intellectual categories hitherto used must undergo an equally revolutionary change. What can be seen here is that categories that have been used to apply to nuclear weapons are beginning to be shifted even to conventional arms, AWS being

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[31] Nathan Leys, "Autonomous Weapon Systems and International Crises," *Strategic Studies Quarterly* 12, no. 1 (Spring 2018): 48–73.

[32] Leys, "Autonomous Weapon Systems and International Crises," 58.

[33] Leys, "Autonomous Weapon Systems and International Crises," 66-68.

one of the most important examples.[34] Here the contrast between the articles of Altmann and Sauer, and Leys, is striking. Altmann and Frank posit that the way in which AWS will affect strategic stability in international relations is similar – if not outright continuous – to how certain aspects of nuclear weapon technology (such as MIRVs or ABM systems). The major difference for them seems technical; problems of proliferation due to easiness of acquisition,[35] and difficulties caused by increasing speeds of weapon systems, which they see as incentivizing a first strike.[36] Ley's, while laying out an argument roughly along the same lines, non the less points, albeit only toward the end, of different strategic cultures and lines of thought that could influence views of AWS on strategic stability.

Pointing to potential criticisms of his article, Leys argues that the topic of autonomous weapons and their effect on crises and foreign policy remains in the realm of speculation and hypothetical scenarios. Urging for further inquiry, Ley's rightly posits that analyses of AWS and their impact on strategic cultures and thinking remains mostly a purview of writers from the United State.[37] Moreover, even the Pentagon's Third Offset strategy that puts autonomous weapons and AI in general at its core, emphasizes the need to completely rethink existing doctrines and paradigms to fully exploit the potential of high-technological advancement.[38] This is a crucial point, as it essentially saying that current strategic thought and current

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[34] Other examples include the American Global Prompt Strike project, as well as various forms of hypersonic weapons and cruise missiles. On hypersonic weapons see Darren Sency, "Cadet Voice: Hypersonic Weapons' Effect on Strategic Stability," *Space & Defense* 10, no. 1 (Spring 2017): 43–50; on cruise missiles see Kulsoom Belal, "Cruise Missiles in South Asia: Implications for Regional Strategic Stability," *Policy Perspectives* 13, no. 1 (2016): 115–34, https://doi.org/10.13169/polipers.13.1.0115; on cyber threats in general see Andrew Futter, "War Games Redux? Cyberthreats, US–Russian Strategic Stability, and New Challenges for Nuclear Security and Arms Control," *European Security* 25, no. 2 (2 April 2016): 163–80, https://doi.org/10.1080/09662839.2015.1112276.

[35] Leys makes a good counterpoint that proliferation is less likely than is generally thought, due to the level of sophistication and sheer quality of code that might be needed.

[36] Altmann and Sauer, "Autonomous Weapon Systems and Strategic Stability," 131.

[37] Leys, "Autonomous Weapon Systems and International Crises," 68.

[38] "Remarks by Deputy Secretary Work on Third Offset Strategy," U.S. Department of Defense, https://www.defense.gov/News/Speeches/Speech-View/Article/753482/remarks-by-d%20eputy-secretary-work-on-third-offset-strategy/.

categories (in the way we see them employed in Altmann and Frank's piece) are seemingly on the verge of being rethought.

What in essence has been revealed is that the knowledge surrounding weapons that are just introduced or about to be introduced can be highly arbitrary and contingent, especially since a debate over the nature of their use is still intellectually and politically undecided. What comes into play is not just pure practice or deploying discourse categories already in existence, but the social component of incorporating this new element of technology into the thinking of society and government officials. Because it is a new technology whose parameters of use are difficult to establish beforehand, anticipating or talking about its effects depends on how it is presented and framed, the types of effects that officials *anticipate* that these weapons will have. In other words, what is being dealt with is something that is hypothetical, even when those weapons will exist.

To add a level of complexity, behind the important issue of strategic stability and strategic implication is a war or departments, ideological thoughts, doctrines etc that is now battling on how exactly autonomous weapons will be understood and (not)accepted in the policy and public realm. To help us see the way this might go it is useful to look at the evolution of thinking surrounding the strategic stability and deployment of nuclear weapons in their early phase and inception.

2. NUCLEAR WAR AS A SOCIAL CONSTRUCT

"I am become death, the destroyer of worlds"

- J. Robert Oppenheimer upon witnessing the Trinity nuclear test at Alamogordo, New Mexico.[39]

"Where these things are used on strictly military targets and for strictly military purposes, I see no reason why they shouldn't be used just exactly as you would use a bullet or anything else."
- Dwight D. Eisenhower at a news conference in 1955 [two years after the Ivy Mike hydrogen bomb test] in response to a question about the possibility of deploying tactical nuclear weapons in the Far East.[40]

History of state understanding of nuclear weapons holds several insights into how a completely new technology can be understood, adopted and used. The invention and deployment of atomic – and later thermonuclear – weapons was perceived to be significant from the onset, but the extent of the significance was what was a matter debate. Significantly, the impact that nuclear weapons had on international relations and military matters was mostly confined to the ideational realm. Previous developments in military affairs have been developed along with their use on the battlefield, often developing strategic concepts as their utility became evident through trial and error techniques. But nuclear weapons were, to a large extent, a "a thinking experiment, and nuclear war a war of thoughts… The large body of sophisticated concepts that was produced over the decades is largely due to the fact that nuclear strategy is *cosa mentale*."[41]

In this chapter, key concepts from the Cold War nuclear development of weapons will be analysed and shown to be historically contingent on particular understandings of nuclear weapons and the social characteristics attributed to the weapons themselves and the actors that

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[39] Never says it then, claims to have thought this at the time. Important for its iconic value.

[40] Dwight D. Eisenhower, "The President's News Conference," March 16, 1955. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. http://www.presidency.ucsb.edu/ws/?pid=10434.

[41] Therese Delpech, ed., "Concepts," in *Nuclear Deterrence in the 21st Century*, Lessons from the Cold War for a New Era of Strategic Piracy (RAND Corporation, 2012), 23, http://www.jstor.org/stable/10.7249/mg1103rc.7.

hold them. It will be shown that circumstances outside the strict destructive properties of nuclear weapons were important in determining how nuclear weapons were thought of.

It will be shown that the distinct lack of attention to nuclear weapons stems partly from the paradox brought about by deterrence theory's inner contradictions, and the historically evolving meaning of that word. The method of this chapter will be to critically survey and examine the historical development through which concepts related to nuclear weapons developed, how they were challenged, and the system of logic that emerged out of those contentions. Moreover, the continued tension between operationalizing the idea so central to the politics nuclear war – deterrence – was in seeming tension with those who opposed the concept on the grounds of attempting to win a nuclear war, commonly known as 'warfighting' doctrine.

2.1 Nuclear Weapons Policy and IR Scholarship

A crucial point of writing anything on the topic of knowledge of nuclear weapons and their policies, is how neglected the nuclear revolution has been in influencing international relations theory. Much of contemporary and 20th century IR scholarship has treated nuclear weapons as a fringe phenomenon that is worthy of mention but hardly in need of analytical insight. Author Campbell Craig in tracing the history of total war in IR thinking observes that "the idea that thermonuclear war can put an end to everything plays a strikingly small part in the history of formal American thinking about international politics."[42] Although Craig mentions American scholarship as the place where this lack is rather evident, a closer examination of non-American IR scholarship would hardly perform any better. Though one would expect a more thorough examination of the issue of nuclear war the closer one gets to nuclear weapons states, this maxim doesn't hold in reviewing the current state of literature.

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[42] Campbell Craig, *Glimmer of a New Leviathan: Total War in the Realism of Niebuhr, Morgenthau, and Waltz* (Columbia University Press, 2003), ix.

The central question of his book is how could a technology so profound as nuclear weapons have such marginal effect on the overall IR scholarship? In other words, Craig asks how could a weapon with the ability to cause unimaginable human suffering and featuring so prominently in military matters since 1945 has had little to no discernible effect on international relations theory.[43] In his answer, Craig posits it is because of a widespread belief in the efficacy of nuclear deterrence that goes rather unquestioned within much of the scholarship. This underlying assumption as to the ability of nuclear weapons to prevent their own use in a catastrophic exchange appears to permeate much of IR assumption about nuclear weapons.[44] Such an understanding of nuclear weapons strategy obscures the contingent nature of the strategies that have underpinned much of policy and academic understanding of their use. Thinking of the most notorious "strategy" of mutually assured destruction (the metaphorical peak of deterrence theory), emblematic of the entire sage of the Cold War, it may come as a surprise that this by no means clear as to how this might invoke stability or strategy in any way. In fact, early on it was believed that possessing nuclear weapons, and having someone else possess them as "deterrent" could only lead to an incitement to war, rather than its stated avoidance.[45]

Early on in when the now famous nuclear strategists of the likes of Thomas Schelling and Bernard Brodie were formulating what would be standard understanding of nuclear weapons, numerous strategic ideas were being formulated as to what nuclear weapons actually change on the world stage.[46] In the earliest, formulations of what would broadly be known as deterrence theory, the consensus in the United States was that in order for the USSR to be

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[43] In his review of much of contemporary IR; Alexander Wendt, Barry Buzan, John Mearshhimer and others, Craig finds nuclear weapons to be almost irrelevant to the conduct of international politics.

[44] Craig, *Glimmer of a New Leviathan,* 164-165.

[45] See Philip Green, *Deadly Logic; the Theory of Nuclear Deterrence* (Schocken, 1966).

[46] Bernard Brodie, *Strategy in the Missile Age* (RAND Corporation, 2007), https://www.rand.org/pubs/commercial_books/CB137-1.html.; Bernard Brodie, *The Absolute Weapon: Atomic Power and World Order* (Harcourt, Brace, 1946).

deterred from their widely assumed aggressive tendencies, the US had to have nuclear preponderance. As Lawrence Freedman puts it in his authoritative history of nuclear strategy, "It must be remembered that it had been felt originally that deterrence depended on an imbalance of terror in the West's favour. It was the preponderance of US nuclear forces, enhanced by the dynamism of her technology, that would keep the Soviet Union's expansive tendencies in check."[47] The idea that two states with an abundant nuclear arsenal could live securely in a stable relationship was considered a dangerously naïve fantasy. Classical realist thought that dominated much of the nuclear scholarship crystalized with the adoption of the first official US nuclear policy, the now infamous NSC-68. In it, surprise first strikes were to be the preferred go to strategy of nuclear arms use. More troublingly, the NSC-68 believed that a stockpile of nuclear weapons by both the Soviet Union and the United States would merely serve as an incitement to war, rather than its prevention.[48]

2.2   A Nuclear Strategy?

In the background of the adoption of NSC-68 and other debates on nuclear weapons, was a thorny question as to how to treat nuclear weapons in the first place. Where they different from the aerial bombardment? Did they represent a revolution in military strategy? Can they be used in combat? As Tannenwald observes in her article on the nuclear taboo, "The line between conventional and nuclear weapons did not always exist but had to be created. Then it had to be maintained-sometimes precariously in the face of repeated challenges made possible by advancing technology and the development of smaller, less destructive nuclear weapons."[49] While Tannenwald's thesis that the discourse on nuclear weapons tilted towards a taboo on

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[47] Lawrence Freedman, *The Evolution of Nuclear Strategy* (Palgrave Macmillan UK, 1989), 119.

[48] Freedman, *The Evolution of Nuclear Strategy,* 67; US National Security Council, "NSC 68: United States Objectives and Programs for National Security," April 14, 1950, www.fas.org/irp/offdocs/nsc-hst/nsc-68.htm (accessed October 25, 2006).

[49] Nina Tannenwald, "Stigmatizing the Bomb: Origins of the Nuclear Taboo," *International Security* 29, no. 4 (2005): 12.

their (first) use remains contested,[50] Tannenwald does succeed in historicizing the early adoption of nuclear weapons. What Tannenwald was able to demonstrate is that during the 1950's, a discourse that saw nuclear weapons as being radically different from other armaments began to take root in the public and policy circles, and soon came to be viewed as a truism. Belief in the uniqueness of nuclear weapons also underlie the belief in deterrence.

The discourse that began to emerge around nuclear weapons encouraged, much to the dismay of some officials[51], saw nuclear weapons being set apart into another category. While implicitly the NSC-68 and many other policy documents pertaining to nuclear use saw them as weapons that in case of a general war[52] *will be used* regardless of whether an opponent might use them first (or not all), an emerging section of the public and political spectrum came to see their use as crossing a metaphorical moral and military line.[53] For Tannenwald, this period in the 1950's "illustrates how the United States was in a process of strategic social construction as emerging taboo against first use of nuclear weapons by creating an alternative norm that tactical nuclear weapons should be treated as ordinary weapons."[54] Talking of "tactical" nuclear weapons came from much of the brass in the Eisenhower administration and particularly from the Air Force, who argued that the normalisation of nuclear weapons is inevitable, and that their effect is no different than traditionally tested methods of strategic bombardment that was widely held as an effective means of conducting a war.[55] As Freedman notes, "By using the adjective 'tactical', it was hoped to link nuclear weapons to weapons of

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[50] See T. V. Paul, "Taboo or Tradition? The Non-Use of Nuclear Weapons in World Politics," *Review of International Studies* 36, no. 4 (2010): 853–63; Carol Atkinson, "Using Nuclear Weapons," *Review of International Studies* 36, no. 4 (2010): 839–51.

[51] Tannenwald, "Stigmatizing the Bomb." Tannenwald quotes Acheson and Eisenhower.

[52] An opaque term that has come to encompass wars with the USSR, though its use seems to be implied also in case of a regional war.

[53] For a problematization on the discourse of 'using' of nuclear weapons see Atkinson "Using Nuclear Weapons." Atkinson argues mostly against the notion of use in Tannenwald's article, but his critique is relevant to the extremely narrow focus on the purely explosive quality of nuclear weapons, at the expense of the everyday ways that nuclear weapons are used.

[54] Tannenwald, "Stigmatizing the Bomb," 23-24.

[55] Freedman, *The Evolution of Nuclear Strategy,* 27-28

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the past and to traditional land warfare. By the end of the 1950s it was apparent that this link was illusory. Nuclear weapons, whatever their shape, size or ostensible purpose, could not be considered 'just another weapon'. But what sort of weapons these 'tactical' nuclear weapons really were remained a mystery."[56]

Throughout most of the 1950's, there was a push from the administration to hold wargames and test scenarios where nuclear weapons are used on a limited, tactical scale, against purely counter-value targets.[57] But it turned out few knew how to use them, yet they were still developed, on a (knowingly) faulty premise where there was a distinct lack of appropriate doctrine and knowledge as to how to differentiate or deploy "tactical" nuclear weapons and strategic nuclear weapons, which were believed to be sufficiently different by their proponents.[58] The debate and competing policies in regards to tactical nuclear weapons illustrate a great deal. There is an evident show of how even the top brass and military decision makers responsible for running the whole nuclear business don't know how to interpret nuclear weapons; are they inherently aggressive? Only first strike weapons? Weapons of stability? Simply just another tool in the history of warfare development as early Eisenhower argues? Do tactical nuclear weapons promote escalation or make nuclear war easier prone use? The last question is especially prominent as it mirrors the discussion about LAWS, and writers arguing whether autonomous systems make war more or less likely than before.

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[56] Freedman, *The Evolution of Nuclear Strategy,* 113.

[57] Matthew Connelly et al., "General, I Have Fought Just as Many Nuclear Wars as You Have," in Forecasts, Future Scenarios, and the Politics of Armageddon, *The American Historical Review* 117, no. 5 (2012): 1431–60.

[58] "Arguments over the use of tactical nuclear weapons did not stop then. The 1950s debate did not resolve anything. The development and deployment of these weapons was encouraged before an appropriate doctrine had been evolved. There was then a marked lack of success in explaining how they could solve, in anything other than the short term, the problems of the West." in Freedman, *The Evolution of Nuclear Strategy,* 111.

2.3 Deterrence in the Vogue

Emerging simultaneously with the debates and strategies of waging nuclear war and wining it, of which tactical nuclear weapons debate was a part, there is an emerging debate on employing nuclear weapons as a completely new category of weapons – a weapon of deterrence. Famously articulated in Bernard Brodies statement that "Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them."[59]

In practice, multiple intellectual and strategic developments took place simultaneously, which encouraged a whole array of weapon's procurements and a manifold of defense programmes, but also different debates and doctrinal clashes as to what nuclear weapons are and what purpose ought they to serve. Freedman (along with Tannenwald) identifies an underlying current that show that a key aspect of this was that nuclear weapons were beginning to be seen as somewhat unique, or at least sufficiently different from preceding weapons to warrant a take on them that different markedly from previous weapon innovations. Though as the earlier section showed, this was by no means an uncontested ground, as the Air Force (the Army following their move) sought a whole category of weapons that would allow them to continue warfare as they knew it. As the previous section showed, there were severe practical and doctrinal problems that made many of the distinctions between tactical and strategic nuclear weapons rather irrelevant, particularly as the introduction of the hydrogen bomb in 1951 blurred the distinction further.

Despite the inherent tension with unclear doctrine as to what nuclear weapons were meant to achieve in the first place, their manufacture and procurement continued unabated. Although few in the policy establishment could agree on exactly the kind of function a weapon

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[59] Brodie, *The Absolute Weapon*, 76.

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of this sort ought to perform, the "need" to have it appeared to outweigh other considerations. While acquisitioning these weapons, new conceptual tools had to be developed to cope with the destructive potential these weapons brought about. Of these new concepts, it is precisely deterrence that stands out as the most significant intellectual policy tool that has come of the early debates and remained rather intact until the present day, though not without theoretical and practical challenges.[60]

The history of deterrence has a great deal of potential to tell us about the direction that the potential doctrinal and intellectual development of autonomous weapons might lead. It is a concept that took time to develop. As Harrington summarizes, the concept of deterrence was "built and disseminated methodically over 50+ years through hundreds of briefings, thousands of conferences, millions of pages, and many lifetimes of intellectual work." For Harrington, the issue lies in the fact that deterrence is no longer critically reflected and debated, and its merit, utility and ability to work is taken for granted. In Harrington's words, deterrence now comes more to resemble "Maslow's aphoristic hammer: If all you have is the concept of deterrence, every nuclear threat becomes a conversation about how many nuclear weapons are necessary to maintain a credible deterrent threat."[61] At present, the premises and conclusions of what is more broadly known as "rational deterrence theory" can be stated without contesting its basic premise, and is often cited as a short hand explanation of why the two super-powers did not go to war during the tense period of the Cold War.[62] Deterrence is readily understood as referring to the operation of nuclear arsenals to dissuade any potential aggressor from attack

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[60] See Eric Schlosser, *Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety* (New York: Penguin Books, 2014); Freedman, *The Evolution of Nuclear Strategy*; and Fred Kaplan and Martin J. Sherwin, *The Wizards of Armageddon*, (Stanford University Press, 1991); Errol Morris, The Fog of War: Eleven Lessons from the Life of Robert S. McNamara, Documentary, Biography, History, 2004, http://www.imdb.com/title/tt0317910/.; Stanley Kubrick, Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb, Comedy, War, 1964, http://www.imdb.com/title/tt0057012/.

[61] Anne Harrington de Santana, "Nuclear Policy and the Politics of Knowledge Production," *POSSE Policy Memo,* 4. Available at http://posse.gatech.edu/sites/default/files/pubfiles/Harrington_policy%20memo.pdf.

[62] Anne I. Harrington, "Power, Violence, and Nuclear Weapons," *Critical Studies on Security* 4, no. 1 (2 January 2016): 91–112, https://doi.org/10.1080/21624887.2016.1177784.

by outweighing any possible gain from a military act by the devastation that would be brought upon them. But as Harrington posits, "back in 1946 when Bernard Brodie first proposed the ideas that are routinely accepted today as the foundation of deterrence theory, whether and how nuclear deterrence would work was not at all clear. The suggestion that the US would produce an entire category of weapons for the sole purpose of preventing rather than waging war was considered strange to the point of being absurd. It went against a set of foundational assumptions about the nature of the international system and the role of the military in maintaining the security of the nation."[63]

2.3   *Nuclear War and its Historical Contingency*

As Freedman reminds us, the concept of deterrence was first theorized in the United States as superiority, in order to deter the USSR, with the chief concept of deterrence being massive retaliation, and not as Brodie theorized the parity being the two. The point was often made that to convince the USSR of the impossibility of attacking the United States – to make the threats appear credible – the Soviets had to be convinced that the US was ready to fight and win nuclear wars. As Harrington reminds us, nuclear deterrence "is an historically specific techno-political and international diplomatic practice that is enabled and constrained by the human capacities for surveillance and destruction."[64] A case in point in how this crucial point is often ignored can be found in the Waltzian neorealist approach to deterrence theory.[65]

Part of Waltz's motive for his neo-realist response to nuclear weapons is the inability of classical realists, most importantly Morgenthau, to come to terms with nuclear warfare. For Morgenthau, nuclear strategy was plagued by irresolvable paradoxes that would either usher in

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[63] Harrington de Santana, "Nuclear Policy and the Politics of Knowledge Production," 5.
[64] Harrington de Santana, "Nuclear Policy and the Politics of Knowledge Production," 6.
[65] For a critical summary of major strands of IR theory and influential voices within the discipline in regards to the concept of deterrence, see Campbell Craig, *Glimmer of New Leviathan*.

nuclear war or a world-state, with roughly the same chance of either coming to fruition.[66] Morgenthau did not believe that the possession of nuclear weapons, regardless of their quantity, form of delivery, or accompanying doctrine, could in any conceivable way result in a peaceful arrangement. This belief stemmed from Morgenthau's conception of power and a rather pessimistic outlook on state behaviour as a result of that. Most importantly, Morgenthau was not able to theoretically reconcile realist ideas about balance of power with the notions of a devastating thermonuclear war – reconciliation as far as its avoidance is concerned, that is. Waltz, saw the issue differently than Morgenthau, positing that nuclear weapons were not necessarily incompatible with balance of power theory. The problem, Waltz argued, is a wrong conception of power by the realists, who see power as an end of international relations, rather than what Waltz posits it to be, a means to achieve state survival. While implicitly agreeing that classical realism is incompatible with deterrence theory, Waltz holds that the problem isn't so much the inability of deterrence theory to match actual state behaviour, but rather it is the realist account of power that is suspect. In Harrington's words: "If nuclear realists are unable to reconcile nuclear strategy with balance-of-power realism, then there is a need to bring realism into line with deterrence theory by collapsing the means–end distinction between violence and power, thereby assuming away the fundamental paradox of nuclear strategy."[67] Anthony Burke in analysing nuclear rationality finds a remarkable continuity running through the writings and policies of those involved theories and policies of nuclear weapons, namely a "a conviction in the rationality of nuclear weapons as instruments of state."[68] Waltz's attempt to bring IR theory in line with the reality of nuclear weapons must inevitably be seen in this light.

[66] Hans J. Morgenthau, H. J. "The Four Paradoxes of Nuclear Strategy." *The American Political Science Review 5*8 no. 1 (1969): 23–35. doi:10.2307/1952752.

[67] Harrington, "Power, Violence, and Nuclear Weapons," 106.

[68] Anthony Burke, "Nuclear Reason: At the Limits of Strategy," *International Relations* 23, no. 4 (1 December 2009): 509, https://doi.org/10.1177/0047117809348697.

Harrington compares the writings and logic behind deterrence of famous (nuclear) strategist Thomas Schelling and Waltz's reformulation of the classical realist position into his new neorealist paradigm as essentially framing his notion of state interaction to match Schelling's concept of strategic stability. [69] For Schelling, strategic stability implies vulnerability of both players through mutual exposure to inevitable destruction through retention of second-strike capabilities. Here, Schelling implicitly posits state survival as a goal, and suggests that states will seek this state of affairs because they find it desirable. The same line of reasoning leads Waltz to smuggle in a "normative desire for great power peace."[70] Redefining power in terms of survival, and as Harrington reminds us, of power as a *currency* in international relations, allows Waltz to see power as a have or have not question. The issue of credibility thus does not exist for Waltz, for so long as a second-strike capacity exists, nuclear war is too costly for states seeking survival to wage. It is this logic that allows Waltz to argue for virtues nuclear proliferation, seeing them as a source of, rather than a threat to, human survival.[71] What is crucial about deterrence theory is how much of its premises hinge on the need of the other side to think in the same way. There is no deterrence unless both sides share equal assumptions and believe that deterrence is the state of affairs between the countries.

Interpretation of intentions radically changed the interpretation of nuclear weapons. Whereas earlier it was widely assumed that the Soviet Union had expansionistic tendencies hell bent on achieving superiority, anything short of one's own superiority would put the United States at a disadvantage, since a probable first strike by the USSR would knock the US out. So parity was seen as favouring the USSR early on, with ideas that parity might be a good thing (articulated early on by Schelling and Brodie, were only later accepted as the mainstream, though they continued to be challenged throughout their time.

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[69] Harrington, "Power, Violence, and Nuclear Weapons," 98.
[70] Craig, *Glimmer of a New Leviathan*, 148.
[71] Kenneth N. Waltz, "Why Iran Should Get the Bomb," *Foreign Affairs*, 1 July 2012, https://www.foreignaffairs.com/articles/iran/2012-06-15/why-iran-should-get-bomb.

A case in point is McNamara's attempt to move away from massive retaliation to what was seen by many as a notion of limited war (in his flexible doctrine), where escalation could be limited without necessarily relying on a massive nuclear exchange. But there was a stark divergence between what McNamara wanted and how the Soviet strategists perceived his policy proposals. As Freedman writes on this era, the Soviets "never accepted the notion of escalation as a set of deliberate, controlled moves. Soviet writings responded to the doctrines being propounded by McNamara in the early 1960s with great hostility, inferring rather sinister motives from his attempt to establish rules for nuclear warfare. By contrast, they argued that it was not possible to rely on 'fire-breaks' between nuclear and conventional war, or to hope that nuclear war could be contained within rigid limits."[72] Under Khrushchev's leadership, the Soviet's, though not, as their response to Chinese activities indicates, particularly enthusiastic about waging a nuclear war, were planning for a total war, placing little hope in notions of limitations. Soviet plans placed no hope to adhering to unspoken rules of nuclear warfare, and Soviet military writing, though hopeful of avoiding a war, derided "controlled" warfare.[73] This is a notion that the soviets clearly held in contempt for a large part of the Cold War, and in fact could hardly imagine a scenario where this would happen without a full blown nuclear escalation. Possessing weapons of the same sort thus did not prevent the Soviets of a different knowledge based much more intimately on a strategy of total war and of *any war* being a threshold for a nuclear exchange. As McNamara found out, limited war can only be waged if both believe in limitations.

It was this rebuff from Soviet strategists about limited war that made McNamara reconsider his pursuit of limited war, and instead stabilize the volatile relationship between the superpowers with a state of affairs that came to be known as mutually assured destruction

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[72] Freedman, *The Evolution of Nuclear Strategy,* 246.
[73] Freedman, *The Evolution of Nuclear Strategy,* 251.

(MAD). The setting for this change was important, as it was predicated, much like the concept of limited war (albeit under a different set of assumptions), of the Soviets operating under the same system of logic, where the "rules" of nuclear brinksmanship would be adhered to. The point was that both countries would understand each other's moves and signals more clearly, resulting in less uncertainty. This, however, was premised on a rather optimistic prediction that the Soviets already understood a set of assumptions. As Freedman points out, this is rather optimistic. Under Khrushchev, the Soviet and US views diverged markedly over issues of nuclear strategy, creating dangerous situations in the process. Firstly, while McNamara was pursuing a second strike deterrent capability, Khrushchev was content with having a minimum deterrent. Secondly, Khrushchev was hoping to reign in the excessively large conventional force of the Soviet Union, downplaying the role of non-nuclear armaments, all the while McNamara was urging an increase in conventional forces to widen the scope of options short of a massive nuclear exchange. These two facts were military dangerous in the era of nuclear war, as many in the Soviet military saw this as a preparation for war; an invulnerable nuclear capability (in the form of second strike, which the Soviets were yet to achieve or even acknowledge), and an extended conventional option for fighting a protracted war. Combined with an initial counter-force strategy, which the US still maintained despite public pronouncements of MAD, stoked Soviet fears of a surprise first strike[74], a feature of the nuclear arms race that owed less to technological developments per se, and more to the fact that nuclear weapons did not produce any single logic of employment and doctrine, allowing for a wide range of interpretations that were not necessarily compatible with each other.

Moreover, Soviet missile build-up (however disadvantaged the USSR position was when it began[75]) during the Khrushchev years was seen by many Western observers as a

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[74] Freedman, *The Evolution of Nuclear Strategy,* 250.
[75] Soviet forces were inferior to the US's until the 1970's.

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continuation of Soviet 'warfighting' tradition. Though, as Freedman points out, deterrence and 'warfighting' were "not necessarily exclusive: the point has often been made in the West that the most credible form of deterrent would be a capability to fight and even win a war if necessary."[76] The significance of the divergence is that that for mutually assured destruction to work, it had to be the one and only doctrine to which both sides agreed to.[77] To rely solely on MAD could "not provide a satisfactory answer to the question of what to do if deterrence failed. … Soviet commentators have found it difficult to accept the idea that long-term peace could be brought about by the fear of nuclear weapons, or that some scientific breakthrough in the future would not upset the balance of terror."[78]

Having the Chinese become nuclear armed presents an even clearer picture of how nuclear and knowledge production around it could be upset. Nuclear thinking depends on two sides engaged in any sort of security situation, in the least, sharing a prospect of its avoidance and an idea about costs and benefits, some form of framework that they must share in common. The Chinese seem to be less concerned of the effects, and their doctrine is focused on different aspects of forces, making nuclear weapons an addendum to their conventional capability, to the point of not having some imaginary line drawn in the sand about how exactly it is that you deploy or not deploy nuclear forces. As Fravel and Mederos point out, China did not have a nuclear strategy to speak throughout the Cold War. Well into the 1960s and 1970s, Chinese military leaders were publicly arguing for a focus on infantry and conventional based warfare, ridiculing the Soviet and American reliance (or, as they saw it, obsession) with nuclear weaponry.[79] As Freedman anecdotally recalls, this led to the Soviets having major misgivings

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[76] Freedman, *The Evolution of Nuclear Strategy,* 255.
[77] Burke, "Nuclear Reason."
[78] Freedman, *The Evolution of Nuclear Strategy,* 255.
[79] As Chinese Defense Minister Lin Piao exclaimed, the "Bourgeois line ignores the human factor and sees only the material factor and... regards technology as everything and politics as nothing." "'The spiritual atomic bomb which the revolutionary people possess is a far more powerful and useful weapon than the physical atomic bomb." Quoted in Freedman, *The Evolution of Nuclear Strategy,* 260.

about Chinese moves, with the Soviet leadership charging the Chinese "with a lack of realism about the effects of nuclear war, pointing out that 'the atom bomb does not adhere to the class principle'."[80]

Explanations for this kind of behaviour are essentially lacking in most evaluations of Chinese behaviour. Some analysts simply dismiss it as China being content with a "minimum deterrent" and thus its small force achieving most of its objectives.[81] Other's assert that mutually assured destruction was achieved with the small Chinese forces.[82] Freedman's observation that "The limited political utility of weapons, so horrific in their consequences that they could be brought to bear only in the most extreme circumstances, was reinforced by past experience. It was hard to identify any 'golden age of deterrence' when the Soviet Union had been kept absolutely passive by an imposing US arsenal."[83] In fact, the Chinese revolutionary spirit and warfighting with conventional weapons seemed to be predicated on that precise understanding of nuclear weapons as having limited political utility.[84]

This chapter has sought to illustrate that the introduction of nuclear weapons did not result in a straightforward or coherent system of logic that would regulate and inform their production, use and strategic employment. In fact, the relative irrationality with continuing the Clausewitzian maxim of using force to achieve political goals (in the famous war as an extension of politics) could no longer hold in a clear and coherent fashion. Furthermore, as this chapter has shown, questions of having a nuclear *strategy* at all – given its irrational scale of destruction – have plagued nuclear politics from onset, beginning with Hans Morgenthau's critique of nuclear weapons policy to Lawrence Freedman's historical account of the

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[80] Freedman, *The Evolution of Nuclear Strategy,* 265.
[81] M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security* 35, no. 2 (2010): 50.
[82] See Fravel and Medeiros, "China's Search for Assured Retaliation," for a complete overview of positions of China's nuclear arsenal.
[83] Freedman, *The Evolution of Nuclear Strategy,* 344.
[84] Hannah Arendt, *On Violence*, (New York: Houghton Mifflin Harcourt, 1969).

fundamental contradictions of nuclear weapons and the problems of attempting to build a rational policy for their use. What was continuously revealed, and this chapter has shown, is best captured by Anthony Burke's summary of the nuclear bomb being "one result of a positivistic scientific project that sought, in the form of abstract knowledge, to discover and distil the most fundamental truths of the universe. However, an applied military—strategic project then sought to put this knowledge to use in a practical way, as if the two were intrinsically connected, as one step follows another; as if there were not also a troubled universe of decisions between equation, conception, production and use."[85]

The point is, no technology has a concrete set of policies and assumptions that are built into it. Certain characteristics make certain technologies suitable or not for different uses, yet by no means does that imply that seemingly "illogical" or "irrational" policies and strategies can be formulated.[86] As has been demonstrated, nuclear weapons are a case in point; seemingly unsuitable for anything other than large scale strategic bombardment, policies (such as the SOIP counterforce options or a "winnable" nuclear war scenario) continued to be developed and contemplated *in spite* of the weight and scale of human and material devastation. An apt summary of the shifting attitudes and understandings to the irreconcilable conundrum of nuclear strategy comes from Lawrence Freedman's observation of changing perceptions of nuclear weapons among liberally-minded individuals: "The legitimization of a balance of terror, once a matter of much liberal and radical distaste, had become a liberal cause. The vice of the perpetual nuclear threat was displaced by the virtue of stability."[87]

The next chapter will illustrate how this evolution of nuclear strategy (or lack thereof, if you wish) resembles the current discussion and debate surrounding autonomous weapons, and how similar the debates seem to be. Given the potential scale of change autonomous

[85] Burke, "Nuclear Reason," 513.

[86] Langdon Winner, *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought* (Cambridge, Mass.: The MIT Press, 1978).

[87] Freedman, *The Evolution of Nuclear Strategy,* 323.

weapons might bring[88], nuclear weapons strategy development and its internal problems might indicate ways in which the employment and development of policy around autonomous weapons might be heading.

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[88] Edward Geist and Andrew J. Lohn, "How Might Artificial Intelligence Affect the Risk of Nuclear War?," Santa Monica, CA: *RAND Corporation*, 2018. https://www.rand.org/pubs/perspectives/PE296.html.

3. AUTONOMOUS WEAPONS AS COLD WAR HISTORY

In a recently published book by Paul Scharre – who has been involved in researching autonomous weapons for over a decade – explicit references are made to nuclear war strategies and their strategists. Throughout Scharre's new book, *Army of None*, explicit references are made to Thomas Schelling and Bernard Brodie, America's highly influential nuclear political theorists.[89] Likewise, terminology is borrowed from Cold War era superpower rivalry. Terms like first-strike, second-strike capacity, offensive vs defensive technology, deterrence and mutually assured destruction. The seeming ease with which these terms could be applied the current debate on the emerging autonomous weapons suggests that drawing parallels with nuclear strategic theory of the 20th century may not be misplaced. In fact, an overview of the recent literature on autonomous weapons in regard to their potential influence on the international system shows a remarkable use of language from Cold War nuclear policy. Drawing on vocabulary and history of nuclear weapons, Altmann and Sauer argue for a critical stance toward AWS due to their potential to "foment an arms race resulting in increased crisis instability and escalation risk."[90] The authors explicitly draw on Cold War lessons to extrapolate the potential effects of nuclear weapons. In an article by Zenel Garcia dealing with strategic stability in the 21st century, the author names conventional (non-nuclear platforms) as one with potentially strategically destabilizing effects.[91] In an article on cyber warfare and strategic stability, Andrew Futter draws on historical and current nuclear postures to argue

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[89] Paul Scharre, *Army of None: Autonomous Weapons and the Future of War*, (New York: W. W. Norton & Company, 2018).

[90] Jürgen Altmann and Frank Sauer, "Autonomous Weapon Systems and Strategic Stability," *Survival* 59, no. 5 (3 September 2017): 118, https://doi.org/10.1080/00396338.2017.1375263.

[91] Zenel Garcia, "Strategic Stability in the Twenty-First Century: The Challenge of the Second Nuclear Age and the Logic of Stability Interdependence," *Comparative Strategy* 36, no. 4 (8 August 2017): 354–65, https://doi.org/10.1080/01495933.2017.1361207.

about the dangers of cyberwarfare, particularly high-speed automated cyberthreats.[92] Stuart Russel writing for the World Economic Forum titled his article "Robots in war: the next weapons of mass destruction?" In it, he worried about what he termed a military "flash-crash" that would unpredictably change the power dynamics between countries virtually overnight.[93] In an article published in the Review of International Studies, Ingvild Bode and Hendrik Huells argued that autonomous weapons may change norms of international politics in the same way that nuclear weapons changed earlier norms of military strategy and of weapons in general.[94] For the authors, autonomous weapons can come into conflict with existing norms of international security, where the authors see nuclear weapons as developing a sort of base setting norm for deployment of advanced and destructive technologies. Writing in the *European Journal of International Security,* Denise Garcia posits that autonomous weapons qualitatively could imperil the existing international humanitarian law and international norms, thereby eroding the world security framework, leading to international instability.[95] Echoing early concerns from nuclear weapons and their purposeful targeting of civilian rather than military populations, Garcia notes the difficult path in bringing nuclear weapons in line with demands of international law. A similar development can be observed in autonomous weapons if proper international legal safeguards are not put into place to ensure law and norm observance.[96] In a study titled *20YY: Preparing for War in the Robotic Age,* Robert Work and Shawn Brimley from the Center for New American Security note the continuities of traditional

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[92] Andrew Futter, "War Games Redux? Cyberthreats, US–Russian Strategic Stability, and New Challenges for Nuclear Security and Arms Control," *European Security* 25, no. 2 (2 April 2016): 163–80, https://doi.org/10.1080/09662839.2015.1112276.

[93] Stuart Russel, "Robots in War: The next Weapons of Mass Destruction?," *World Economic Forum*, accessed 7 May 2018, https://www.weforum.org/agenda/2016/01/robots-in-war-the-next-weapons-of-mass-destruction/.

[94] Ingvild Bode and Hendrik Huelss, "Autonomous Weapons Systems and Changing Norms in International Relations," *Review of International Studies*, (February 2018): 1–21, https://doi.org/10.1017/S0260210517000614.

[95] Denise Garcia, "Future Arms, Technologies, and International Law: Preventive Security Governance," *European Journal of International Security* 1, no. 1 (February 2016): 94–111, https://doi.org/10.1017/eis.2015.7.

[96] Garcia, "Future Arms, Technologies, and International Law."

American strategies emerging from the Cold War as guiding in terms of doctrinal incorporation of autonomous weapons into the current strategic environment of the United States.[97] They maintain that the potential for "core concepts of defense strategy, including deterrence, reassurance, dissuasion and compellence" to be challenged or modified is high, though the exact contours of that change remain in the realm of speculation.[98] Drawing on the precedent set by Cold War policy, Work and Brimley maintain, "technological superiority over potential state adversaries is now considered a foundational aspect of any U.S. defense strategy,"[99] indicating a need for the United States to develop autonomous weapons to keep US military superiority. This – as with nuclear weapons – raises the awkward question of acquiring new forms of weaponry without having a proper idea as to what function these new weapons ought to perform.

3.1   *Autonomous Weapons as Nuclear Strategy*

What these articles indicate is that many authors writing on the strategic implications of autonomous weapons – whatever those implications may be for them – see parallels between the current development of a potentially revolutionary military technology of autonomy in weapon systems and nuclear weapons of the mid-20th century. The parallels they draw between the two brings with it a distinct set of vocabularies and notions from nuclear theory that the various articles employ. As those involved seek to comprehend and predict ways in which autonomous weapons will feature in a given state's armed forces, it is illustrative to draw parallels of the similarities and differences between the concerns over nuclear weapons (non)use and autonomous weapons. Regardless of the physical characteristics or degree of autonomy in any future weapon system, military doctrine regarding their use and the

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[97] Shawn Brimley and Robert Work, *20YY: Preparing for War in the Robotic Age* (Center for a New American Security, 2014).
[98] Brimley and Robert Work, *20YY: Preparing for War in the Robotic Age*, 6.
[99] Brimley and Robert Work, *20YY: Preparing for War in the Robotic Age*, 7.

bureaucratic understanding of those weapons will be a key determinant in the way AWS might be employed, and thus how it influences the international order. As illustrated in the discussion about nuclear weapons, new military technologies and systems do not simply spawn in a vacuum, but rather are understood within pre-existing military-theoretical frameworks that are embedded in the institutional practices and existing strategic cultures, as well as minds of individuals.

The technical properties and complexity of hardware and software will be of importance in so far as the military organisational structures in place are receptive to the deployment of autonomous weapons in various missions. Military doctrine and specific military cultures of individual militaries and even departments[100] within will be of crucial importance in deciding whether or not the defense establishment of a state will come to accept AWS as employable within existing military paradigms, or perhaps whether there will be willingness to develop new ones to accommodate the technology. In discussing the potential employment of AWS in Western militaries, for example, Michael Haas and Sophie Fischer argue that the penchant for targeted killings could lead to an early employment of AWS in the role of individualized aerial anti-personnel platforms.[101] While maintaining that the emerging autonomous weapons "might be conducive to an expansion of targeted killings to scenarios other than military counter-terrorism,"[102] Haas and Fischer acknowledge that a decisive factor in a wholescale adoption of AWS as a military tool will be the ability to effectively integrate AWS within a "military-theoretical paradigm" of targeted killings.[103] The barrier to an early

[100] As noted in the previous section, different department within the United States military were at different types receptive or strongly opposed to nuclear weapons and their various doctrines of employment. Until the development of reliable submarine based ballistic missiles capable of carrying nuclear warheads, the US Navy decried the Air Force's strategic nuclear bombardment as 'inhumane' overkill. This change rapidly with the advancement of SLBMs. For further discussion see Freedman, *The Evolution of Nuclear Strategy,* chapter 11: The Technological Arms Race.
[101] Michael Carl Haas and Sophie-Charlotte Fischer, "The Evolution of Targeted Killing Practices: Autonomous Weapons, Future Conflict, and the International Order," *Contemporary Security Policy* 38, no. 2 (4 May 2017): 289-290, https://doi.org/10.1080/13523260.2017.1336407.
[102] Haas and Fischer, "The Evolution of Targeted Killing Practices," 281.
[103] Haas and Fischer, "The Evolution of Targeted Killing Practices," 290.

employment of AWS into militaries might, Hass and Fischer argue, the "ingrained, pre-existing beliefs," that might not see the use of AWS as compatible with the currently tightly centralized, hierarchical and closely supervised military operations of Western militaries.[104]

A strikingly similar development occurred with nuclear weapons. Debate around making tactical nuclear weapons distorted the important question of whether the doctrinal current would make nuclear weapons a natural progression in the destructiveness of strategic bombing or whether nuclear weapons would be set into an entirely separate category of weapons. The existing doctrine of strategic bombing that was the purview of the Air Force wanted to normalize nuclear weapon's use rather than to make them a unique weapon with purely deterrent characteristics. As illustrated by official US documents and statements of the time, most importantly the NSC-68 and President Eisenhower's speeches, the dominating belief among US defense circles till about the mid-1950s was that nuclear weapons constitute a continuation with a tested operational doctrine of strategic bombing.[105] Nuclear planning thus reflected a doctrinal continuation until it was challenged and eventually replaced by deterrence theory, although the idea of fighting and winning nuclear wars continued to challenge deterrence theory throughout the Cold War. Autonomous weapons have the potential to cause a similar challenge to mainstream military logic of particular nations.

3.2   *Trajectory of Weapon Autonomy*

In this regard, it is interesting to already see the technological divergence in place within world militaries. As Haas and Fischer argue, the dominance of airpower and its use in targeted killings has made aerial autonomous weapons much more prominent in the technological

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[104] Haas and Fischer, "The Evolution of Targeted Killing Practices," 290, 297-298.

[105] For a deeper elaboration of this specific period, see Edward Kaplan, *To Kill Nations: American Strategy in the Air-Atomic Age and the Rise of Mutually Assured Destruction* (Ithaca, NY London: Cornell University Press, 2015).

developments of Western militaries.[106] Already dominant in UAV's and air power, Western countries are primarily looking at autonomizing their already existing fleets of UAVs and fighter planes. The American X-47B, the French *nEUROn*, and British *Taranis* all reflect a desire to have an autonomous vehicle capable of air dominance and stealthy targeted assassinations.[107] This is in marked contrast the Russian development that has been primarily focused on developing autonomous land-based platforms. Projects such as the land-based URAN-9 or *Vikhr* tank platforms show a concerted effort to develop UGVs with autonomous capabilities in line with Russia's predominantly land oriented army, where armoured units remain a strong component.[108] Similarly, the Chinse military, in line with their doctrine of area-denial operations around their shore, have invested in autonomous weapons with a goal of making an extended area-denial flight and sea-based capacity.[109]

That militaries around the world are developing capabilities that fit their existing military and strategic cultures is no surprise. In this sense, the development of autonomous weapons is in line with the nuclear weapons development where Western air power made bomber's a central piece in NATO war-planning, where as land based ballistic missiles of all ranges and on multiple platforms formed the centre-piece of nuclear delivery in the Warsaw Pact countries. What stands out is the use of Cold War era vocabulary, particularly by US officials, to describe the technological competition. Though official US document explicitly state the need to remain technologically superior, they are markedly less clear as to what new advances in autonomy and artificial intelligence are meant to do, much less how they will operate within existing international security frameworks. The US Department of Defense's

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[106] Haas and Fischer, "The Evolution of Targeted Killing Practices."

[107] For an overview of these systems, see Scharre, *Army of None.*

[108] 'Минобороны продемонстрировало работу боевого робототехнического комплекса "Уран-9"', *TACC*, accessed 10 May 2018, http://tass.ru/armiya-i-opk/5181831.

[109] Ngo Minh Tri, "China's A2/AD Challenge in the South China Sea: Securing the Air From the Ground," *The Diplomat*, accessed 10 May 2018, https://thediplomat.com/2017/05/chinas-a2ad-challenge-in-the-south-china-sea-securing-the-air-from-the-ground/.

technological initiative is formulated most explicitly in the "Third Offset Strategy."[110] The plan

intentionally evokes Cold War memory politics, during which the first two offset strategies

were formulated, the first regarding nuclear weapons, the second to push for the development

of precision guided munitions.[111] Though the Third Offset Strategies purpose is clear – to

ensure the US stays technologically ahead of Russia and China – the crucial question of

doctrine and operational purpose is pushed to the future.[112] In terms of continuity, the first and

third offset strategies display an uncanny continuity; technologies are spearheaded and

developed on the grounds that adversaries might have them, and that no technology can be

developed elsewhere without it first being in the hands of the United States, and preferably in

superior numbers and quantity.[113] Yet as with nuclear weapons, autonomous weapons seem to

be developed without a concrete military strategic purpose in mind, or without much effort to

construct one. Given its potential rapid proliferation due to the software heavy side,[114] the lack

of a proper examination as to the doctrinal operationalization of autonomous appears rather

myopic. In so far as the military thinking involved appears to mimic Cold War thinking,

acquiring new technologies has become a military project in its own right, quite unrelated to

the necessity or desirability of any particular military-technological asset being developed. In

same way that nuclear weapon's platforms, warheads, delivery systems and the alike came out

as a result of internal competition within the military, the same can be observed on recent

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[110] As articulated by US Deputy Defense Secretary Bob Work. "Remarks by Deputy Secretary Work on Third Offset Strategy," U.S. Department of Defense, accessed 10 May 2018, https://www.defense.gov/News/Speeches/Speech-View/Article/753482/remarks-by-deputy-secretary-work-on-third-offset-strategy/.

[111] Scharre, *Army of None*, chapter "The Future Being Built Today."

[112] "Remarks by Deputy Secretary Work on Third Offset Strategy," U.S. Department of Defense.

[113] Articulated Air Force General Paul Selva and Deputy Defense Secretary Bob Work in a talk at the Center for Strategic and International Studies. "Deputy Secretary: Third Offset Strategy Bolsters America's Military De," U.S. Department of Defense accessed 10 May 2018, https://www.defense.gov/News/Article/Article/991434/deputy-secretary-third-offset-strategy-bolsters-americas-military-deterrence/.

[114] See Altmann and Sauer, "Autonomous Weapon Systems and Strategic Stability," 122-128 on why proliferation with AWS could be extremely easy.

technological investments of which the Third Offset is only a part of.[115] Commenting on the *post-hoc* rationalizations of weapons inventions, a US senator in 1967 described anecdotally the proposed anti-ballistic missile defense project as a "missile in search of a mission."[116] This logic now seems to pervade the current drive for autonomous weapons.

3.3 *Back to the Future*

There is a further similarity which can carry dangerous repercussion if not addressed. It is the perception that conventional deterrence in autonomous weapons and artificial intelligence in general is predicated on superiority of the United States. As indicated in the previous chapter, the perception that a functioning deterrence (whatever its other misgivings) was initially predicated on US nuclear superiority and a threat of massive retaliation, not abandon until the Cuban Missile Crisis. The view that US preponderance was, as noted, needed to avoid war was deeply rooted in US defense thinking at the time.[117] As indicated by Bob Work's speech on the Third Offset strategy, the notion that US superiority was key to Cold War peace is still prevalent.[118] As Freedman and other historians have shown, this belief – carried into policy – was seen as aggressive by the Soviet Union, and did more to promote an arms race and mutual insecurity rather than provide a stable strategic relationship. To predicate an entire military-investment policy on attempting to achieve superiority will likely follow the example of nuclear policy, where an arms race triggered by a perceived need to achieve superiority for the sake of deterrence led to a profoundly unstable relationship. The drive to develop autonomous weapons for the sake of an ill-devised 'deterrence through superiority' occur within an intellectual environment where a key question of the *nature* of autonomous

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[115] See various DARPA projects for more details.
[116] Freedman, *The Evolution of Nuclear Strategy*, 323.
[117] Andrew J. Bacevich, *American Empire: The Realities and Consequences of U.S. Diplomacy* (Cambridge, Mass.: Harvard University Press, 2002).
[118] "Remarks by Deputy Secretary Work on Third Offset Strategy," U.S. Department of Defense.

weapons has not been settled.[119] To take but one example, the debate whether autonomous weapons would increase the risk of war or lower them is on-going with no authoritative conclusion in sight.

The idea that force posture alone might trigger a military conflagration originates with nuclear weapons and their concomitant modes of delivery and structures of deployment.[120] Though evidently absurd in standard theories of war,[121] it remains a parcel of strategic analysis, and autonomous weapons are but the latest manifestation of this modern phenomenon.[122] To attempt to pursue superiority in light of ambiguous stances on the strategic implication of fielding autonomous weapons – beyond vague and catch all statements on their revolutionary and 'disrupting' implications – appears to replicate early nuclear policy of the United States. The rationality of developing and deploying autonomous weapons thus finds itself on shaky grounds. Where the rationality of MAD or other theories of employing nuclear weapons often ran counter to basic political and military rational calculus, AWS are justified internally. In other words, their existence will justify their further existence, without reference to any outside factor other than a possible acquisition (however dubious) by future adversaries. Though often publicly justified in terms of what James Der Derian has called *virtuous wars*,[123] the objective of minimizing casualties of one's own force appears rather incidental (and undoubtedly convenient) to those advocating for autonomous weapons. There exists a possibility that weapons, in this case autonomous, will become part of military arsenals without a necessary political end for their existence in mind. A framework for employing a weapon with potentially far reaching consequences into pre-existing logics of deterrence or other doctrinal precepts –

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[119] Brimley and Robert Work, *20YY: Preparing for War in the Robotic Age*.

[120] Freedman, *The Evolution of Nuclear Strategy*, 153.

[121] Anne I. Harrington, "Power, Violence, and Nuclear Weapons," *Critical Studies on Security* 4, no. 1 (2 January 2016): 91–112, https://doi.org/10.1080/21624887.2016.1177784.

[122] Brimley and Robert Work, *20YY: Preparing for War in the Robotic Age*.

[123] In light of Der Derian's observation on the remarkable muteness of enemy body counts in modern battlefields, autonomous weapons might further put the death and suffering of the unwanted other "out of sight, out of mind." James Der Derian, *Virtuous War: Mapping The Military-Industrial-Media-Entertainment Network* (Boulder, Colo: Westview Press, 2001), xxxi.

as illustrated here garnered primarily from nuclear policy history – runs the risk of ill conceived

utilizations of autonomous weapons taking root in military and policy thinking.

CONCLUSION

The intellectual and policy development surrounding the current drive toward autonomous weapons has evident parallels to that of nuclear weapons in the 20th century. Introducing the topic of autonomous weapons has demonstrated the relative infancy of the current stage of the debate on potential implications of AWS. Discussions have so far been limited to ethics and law, with implication for international relations taking second stage. Though the most recent literature on the potential effects of autonomous weapons adoption has expanded into the realm of International Relations, most of the analysis is often conducted with an unstated template adopted from nuclear policy. This thesis has sought to elucidate this inadvertent connection by recalling the history of nuclear weapons policy. What has been shown is the contingent and convoluted nature of nuclear policy and the historical process of knowledge formation through which nuclear weapons have over the decades been viewed. As illustrated in the last section, nuclear policy is influential in how exactly autonomous weapons are conceptualized, the issues at play, and the vocabulary used to describe the effects that a potential development of AWS might have upon states and the international order.

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