

# REPORT DOCUMENTATION PAGE

*Form Approved*  
*OMB No. 0704-0188*

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

<b>1. REPORT DATE (DD-MM-YYYY)</b> 01-06-2017	<b>2. REPORT TYPE</b> FINAL	<b>3. DATES COVERED (From - To)</b>
--	--------------------------------	-------------------------------------

<b>4. TITLE AND SUBTITLE</b> Lethal Autonomous Weapons: Take the Human Out of the Loop	<b>5a. CONTRACT NUMBER</b>
	<b>5b. GRANT NUMBER</b>
	<b>5c. PROGRAM ELEMENT NUMBER</b>

<b>6. AUTHOR(S)</b>  Major Amanda Del Re, US Army  Paper Advisor: Prof Tim Schultz	<b>5d. PROJECT NUMBER</b>
	<b>5e. TASK NUMBER</b>
	<b>5f. WORK UNIT NUMBER</b>

<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b>  Naval War College 686 Cushing Road Newport, RI 02841-1207	<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>
--	---

<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>	<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>
	<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>

**12. DISTRIBUTION / AVAILABILITY STATEMENT**  
Distribution Statement A: Approved for public release; Distribution is unlimited.  
Reference: DOD Directive 5230.24

**13. SUPPLEMENTARY NOTES** Update.

**14. ABSTRACT:** Lethal Autonomous Weapons: Take the Human Out of the Loop.  
The United States government needs to develop and employ lethal autonomous weapons (LAWS) on the battlefield. There are two main arguments that this paper will explore: first, robots are potentially more proficient than humans on the battlefield and second, the United States needs to employ LAWS because other countries already are and the US needs to set the international example. Humans are inferior to robots in warfare and this paper will discuss historical examples in which humans exercised poor judgment in battle or were incapable of deciding due to the effects of combat. Humans are more expensive than robots and this paper show the economic benefits of employing LAWS. As a superpower, the US needs to develop and employ LAWS to establish international norms and be prepared to propose international agreements. The US is one of two countries that has a policy regarding LAWS and it is vague and over five years old. This paper describes the other countries that are currently developing and employing LAWS. Removing the human from the loop is an under represented argument because of legitimate concerns to include lowering the bar to entry to war, violating human dignity, and hacking. This study explores and ultimately refutes these concerns. Ultimately, the most important reason why LAWS should be adopted is that they will save lives.

**15. SUBJECT TERMS**  
killer robots, lethal autonomous systems, ethics, future technology, EEMT

<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b> Ass. Dean-Electives & Research
<b>a. REPORT</b> UNCLASSIFIED	<b>b. ABSTRACT</b> UNCLASSIFIED	<b>c. THIS PAGE</b> UNCLASSIFIED			<b>19b. TELEPHONE NUMBER (include area code)</b> 401-841-3556

---

**US NAVAL WAR COLLEGE**

**Newport, Rhode Island**



**Lethal Autonomous Weapons: Take the Human Out of the Loop**

Amanda Del Re

Major, US Army

A paper submitted to the Faculty of the US Naval War College in partial satisfaction of the requirements for the Ethics of Emerging Military Technology Graduate Certificate.

The contents of this paper reflect the author's views and are not necessarily endorsed by the US Naval War College or the Department of the Navy.

16 June 2017



## **Table of Contents**

Introduction	5
Main Body (Discussion/analysis)	
Humans Are Inferior to Robots	8
Competing in the Global Arms Race	24
Another Approach (Counter Arguments)	33
Recommendations and Conclusion	36
Bibliography	38

## **Abstract**

The United States government needs to develop and employ lethal autonomous weapons (LAWS) on the battlefield. There are two main arguments that this paper will explore: first, robots are potentially more proficient than humans on the battlefield and second, the United States needs to employ LAWS because other countries already are and the US needs to set the international example. Humans are inferior to robots in warfare and this paper will discuss historical examples in which humans exercised poor judgment in battle or were incapable of deciding due to the effects of combat. Humans are more expensive than robots and this paper show the economic benefits of employing LAWS. As a superpower, the US needs to develop and employ LAWS to establish international norms and be prepared to propose international agreements. The US is one of two countries that has a policy regarding LAWS and it is vague and over five years old. This paper describes the other countries that are currently developing and employing LAWS. Removing the human from the loop is an under represented argument because of legitimate concerns to include lowering the bar to entry to war, violating human dignity, and hacking. This study explores and ultimately refutes these concerns. Ultimately, the most important reason why LAWS should be adopted is that they will save lives.

## **I – Introduction**

Lethal Autonomous Weapons (LAWS) should be employed by the United States on the field of battle. LAWS will save lives because they are potentially more proficient on the battlefield than humans. There will not be as many combat-related deaths or injuries which will result in a healthier, more resilient military. It behooves the United States to employ this emerging technology because other nations already are. As a superpower, the United States bears the burden of setting the example in warfare and foreign policy.

A Lethal Autonomous Weapon is a robot that is designed to select and attack military targets without direct intervention by a human operator. The idea of not having a human operator is called “human-out-of-the-loop.” Autonomous weapons also have the capability of operating with a “human-in-the-loop” (like a drone and drone operator) or a “human-on-the-loop” in which a human operator supervises the targeting process and can intervene at any time during the cycle. Currently, the US employs both human-in-the-loop and human-on-the-loop weapons in combat. Lethal autonomous Weapons are also called LAWS, LARS (lethal autonomous robots), robotic weapons, or killer robots. For these purposes, LAWS, robots, or lethal autonomous weapon will be used.

This study will present a somewhat unrepresented argument, that LAWS should be developed and employed by the United States on the battlefield. There are several premises to support this conclusion. First, humans are overall inferior on the battlefield as compared to robots. Historically humans deal poorly with the traumatic effects of combat resulting in war atrocities, posttraumatic stress disorder, increased veteran suicide and homelessness; robots would not be negatively affected by combat like humans are. Additionally, human soldiers are more expensive in the long run than robots.

Second, the United States needs to stay on the cutting edge of technology especially in warfare. History provides examples of the United States using ethically questionable strategies in war such as unrestricted submarine warfare and strategic bombing, both in WWII, without having had the chance to fully examine the potential ramifications of those strategies prior to the heat of conflict. Moreover, other nations are already employing LAWS. The United States needs to lead the development of these weapons in terms of technological capabilities and ethical standards so that an international agreement can be achieved before they are misused by another nation.

This project acknowledges and rebuts several important counterarguments to the use of LAWS. First, critics argue that LAWS will further lower the bar to entry into war. Additionally, empowering a machine to kill a human violates human dignity. Finally, there is no absolute way to prevent LAWS from being hacked and potentially being used against their master or for another unintended purpose. These are all reasonable reasons to be reluctant to employ LAWS; however, these reasons do not justify many critics calls to ban them. While LAWS may make waging war easier, this paper presents the idea that technology lowering the bar to entry into war is only a symptom of a much larger problem and banning LAWS will not make this problem go away. Furthermore, while a machine with the authority to kill a human may violate human dignity, this study suggests that *every* weapon, aside from human hands, used in war violates human dignity. Finally, cyber is a legitimate threat to employing LAWS; however, manned systems are also vulnerable to cyber-attack. Therefore, programmers and operators must ensure the highest safeguards when developing and employing LAWS.

There are many valid reasons to be reluctant to employ such a dangerous capability; however, this paper posits that such reluctance can result in more lives lost. LAWS can

potentially prevent combat deaths. Some critics allude to *Terminator* and *Westworld*-esque scenarios in which machines take over the world. While this is a reasonable concern it fails to consider the fact that technology is a reflection of *human* priorities and values. After all, humans will be the creators of LAWS so they will only do what they are programmed to do (or not do). Furthermore, artificial intelligence (AI) has become significantly more sophisticated in the past few years and is only continuing to do so at a remarkable pace.<sup>1</sup>

Most importantly, this study will shed light on a concept that is often discussed in a one-sided manner. The under-represented side of this debate needs to be seriously considered to prevent potential strategy-policy mismatches in warfare and preserve lives.

---

<sup>1</sup> Consider that in July 2016 the speech recognition word error rate for *Google Home* was 8.5 percent, as of May 2017 that rate has decreased to only 4.9 percent. Timothy B. Lee, "Artificial Intelligence is getting more powerful and it's about to be everywhere," *Vox*, May 18, 2017, accessed May 29, 2017, <https://www.vox.com/new-money/2017/5/18/15655274/google-io-ai-everywhere>.



## II – Humans are Inferior to Robots

Humans are high-maintenance, flawed, and deal poorly with the horrific effects of war. Robots can be far more proficient at warfare. Humans after all, are human. They make mistakes often and emotion clouds their judgment. Humans require a great deal of maintenance to be at peak performance. Humans fall prey to the horrors of war, often resulting in atrocities and long-term physical and psychological damage. Human troops are expensive and, in the long run, more expensive than robots. Robots are unemotional, cheaper, and not susceptible to committing an atrocity for self-preservation or revenge. This chapter examines why humans are inferior warriors and why robots may be superior and more ethical combatants.

The stresses of combat affect judgment. Consider a few personal accounts of dealing with combat stress. James R. McDonough, a Platoon Leader in Vietnam, describes his uncontrollable emotions after surviving his first firefight: “My emotions were breaking through the fatigue that had numbed them, and my mood shifted dramatically from one extreme to another.”<sup>2</sup> McDonough is describing the effects of shock after trauma. He initially felt detached or “numbed,” and in the aftermath of battle his erratic emotions are irrepressible. Napoleon had described that the most dangerous point in battle is immediately after victory because that is when the soldier is most vulnerable to counterattack.<sup>3</sup> Although Napoleon did not realize it at the time, he was describing “parasympathetic backlash” which occurs immediately after the attack “has halted and the soldier briefly believes himself to be safe.”<sup>4</sup> During this parasympathetic backlash, a soldier becomes “physiologically and psychologically incapacitated” or, in

---

<sup>2</sup> James R. McDonough, *Platoon Leader: A Memoir of Command in Combat* (New York, NY: Random House, 1985), 113.

<sup>3</sup> Carl von Clausewitz, *On War*, (Princeton, NJ: Princeton University Press, 1984).

<sup>4</sup> Lieutenant Colonel Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society* (New York, NY: Little, Brown and Company, 2009), 70.

McDonough's case, "numbed."<sup>5</sup> Karl Marlantes, also a Platoon Leader in Vietnam, echoes this theory when he describes his experience in war as "the predominant feeling when you win in battle, is numbed exhaustion."<sup>6</sup> Critics of autonomous weapons state that humans possess judgment, something that a robot never could. However, the concept of the parasympathetic backlash undermines reliance on human judgment since humans may be unable to control their basic functions and emotions during and even some duration after the trauma of battle.

Kurt Vonnegut describes his experience as a POW during the bombing of Dresden: "I saw the destruction of Dresden. I saw the city before and then came out of an air-raid shelter and saw it afterward, and certainly one response was laughter. God knows, that's the soul seeking some relief ... Humor is an almost physiological response to fear."<sup>7</sup> Vonnegut remembers that his body had a physiological and uncontrollable reaction to the stress he endured during the Dresden bombing. While laughter may not detrimentally affect decision making, he still loses control of his reactions which has the possibility of clouding judgment. Vonnegut's reaction was a symptom of a stunned, numbed psyche.

Humans are high-maintenance. In a normal 24-hour period, they require eight hours of sleep, approximately 2000 calories of nutritious food, one hour of fitness-oriented physical activity, and the human brain needs periodic breaks throughout the waking hours.<sup>8</sup> These requirements are not easily obtained in a combat environment due to the physiological effects of stress. Walter Bradford Cannon coined the body's method of coping with stress the "fight-or-

---

<sup>5</sup> Grossman, *On Killing*, 70; McDonough, *Platoon Leader*, 113.

<sup>6</sup> Karl Marlantes, *What it is Like to go to War*, (New York: Grove Press, 2011) 34.

<sup>7</sup> Kurt Vonnegut, *A Man Without a Country*. (New York, NY: Seven Stories Press, 2005), 3.

<sup>8</sup> Max Hirshkowitz, "National Sleep Foundation's sleep time duration recommendations: methodology and results summary," *Journal of the National Sleep Foundation*, 1, no. 1 (March 2015), accessed December 31, 2016, <http://www.sleephealthjournal.org/article/S2352-7218%2815%2900015-7/fulltext#s0010>

flight” response.<sup>9</sup> The fight-or-flight response “is a set of physiological changes initiated by the sympathetic nervous system to mobilize body systems in response to stress.”<sup>10</sup> These changes involve increased heart rate and blood pressure and blood glucose levels, all physiological factors that can affect thought and judgment and, arguably, undermine the ability of human combatants to meet the martial effectiveness and ethical standards demanded in modern warfare.

The human body, like a robot, is a complex system of systems. Yet unlike their robot counterparts, human shortcomings are magnified in combat when physiological and cognitive systems are stressed. Robots’ have no sympathetic nervous system susceptible to rapid changes in heart rate, blood pressure, and blood glucose levels during combat. Unencumbered by a sympathetic nervous system, robots are not susceptible to the “parasympathetic backlash;” they will not be “numbed” or “stunned” after battle. Rather, robots will remain consistent and calm during and after all combat engagements. Moreover, the heat of battle will not disrupt a robot’s decision-making abilities, but it will disrupt a human’s which could lead to errors in judgment and ethical mistakes.

Humans have been struggling with ethical conduct throughout the long history of warfare. Robots may help solve some of the ethical problems that emerge in warfare and may be the answer to some of the ethical questions that warfare asks. Consider several examples from the history of warfare in which human emotion drove an unethical decision and had dire consequences.

Thucydides demonstrated in 431 BC that human nature and the nature of war are unchanging even though *warfare* may continually evolve. Over 2500 years later, his theory

---

<sup>9</sup> Walter Bradford Cannon, “Bodily Changes in Pain, Hunger, Fear and Rage.” *The American Journal of Psychology*, 42, no. 2 (April 1930): 322-25.

<sup>10</sup> Eds of American Heritage Dictionaries., Fight-or-Flight response. In *American Heritage Dictionary of Medicine*. (Boston, MA: Houghton Mifflin)

remains intact. Thucydides offered many instances of the ethical problems in war, and one of the most significant is the Mytilene Debate which occurred during the Peloponnesian War in 427 BC. The case is unique because ultimately the actor made the ethical choice, but the methods in which he comes to this choice should be examined. Thucydides wrote that the Athenian army had just defeated Mytilene, and the Athenian general, Cleon, is trying to decide what to do with the Mytilene people. Cleon emotionally decided that they will kill all the men and sell the women and children into slavery.<sup>11</sup> Almost out of nowhere, Diodotus appears and offered another approach. Diodotus calmly suggested that Cleon's solution is not the right answer as it is filled with haste and passion and "haste usually goes hand in hand with folly, passion with coarseness and narrowness of mind."<sup>12</sup> Diodotus explains that such a violent approach would not help the Athenians to achieve their political aims so it would be a waste of resources. Additionally, the next time a group revolts they will fight until the death because they will see death as inevitable. Ultimately, Cleon decided that Diodotus was right and the Athenians refrained from slaughtering the Mytilenes. This case is unique because of the mystery surrounding the character of Diodotus. Consider one historian's theory that Thucydides created Diodotus as there is no other record of Diodotus in the rest of Thucydides' account. Diodotus means "gift from the gods."<sup>13</sup> Diodotus may have been a character created to represent the constant ethical dilemmas in warfare, or to show that Cleon was in fact a toxic leader that was unable to make an ethical decision without external help. After all, Cleon was the reason that Thucydides was later exiled. In either case, Thucydides shows that humans can easily fall prey to emotion like Cleon almost did, and can make unethical decisions as a result.

---

<sup>11</sup> Robert B. Strassler ed. *The Landmark Thucydides* (New York, NY, The Free Press: 1996).

<sup>12</sup> *Ibid.*, 3.42.

<sup>13</sup> Professor Bernstein "Cleon's Side of the Story," *Naval War College Strategy and Policy Lecture*.

Thucydides could also be using the character of Diodotus as a *Deus ex machina*. *Deus ex machina* means “god from the machine.”<sup>14</sup> The term originates from ancient Greek tragedies. In Greek plays it was a platform or machine that literally lowered actors playing gods onto the stage.<sup>15</sup> Now the term is more related to a plot device in which a seemingly unsolvable problem is suddenly able to be resolved because of some new development, character, ability, etc. Thucydides’ audience would be familiar with this “plot twist” as it originated on stage in 431 BC with Euripides’ *Medea*.<sup>16</sup> 431 BC is when the Peloponnesian War began and when Thucydides began writing his comprehensive account. In this sense, Diodotus was a “gift from the gods” sent to help Cleon solve what he saw as an unsolvable problem. Today, robots could be man’s Diodotus, sent to help humankind navigate the evolution of warfare.

Diodotus represents the rational, objective approach to the situation whereas Cleon is emotional and passionate. Cleon represents Clausewitz’s “primordial violence, hatred, or enmity,” one of the three basic dominant tendencies in warfare.<sup>17</sup> Clausewitz refers to this tendency as the “passions.”<sup>18</sup> According to Clausewitz, the passions “are kindled in war must already be inherent in the people.”<sup>19</sup> If Cleon represents the “passions” of “the people” then Diodotus exemplifies the counterbalance to those feelings of fervor. By inserting a fictitious character, and an external source of reason and logic, Thucydides shows that the humane response and the human response are not one in the same.

Thucydides’ passionate and unethical warriors are unfortunately not relegated to the Peloponnesian war. Consider the My Lai massacre of March 1968 in which up to 500 unarmed

---

<sup>14</sup> Thomas Chondros, Kypros Milidonis, George Vitzilaios, John Vaitsis, “Deus-Ex-Machina’ Reconstruction in the Athens Theater of Dionysus,” *Mechanism and Machine Theory* 67 (Sept 2013).

<sup>15</sup> Ibid.

<sup>16</sup> Walton, J Michael, trans. *Euripides: Medea*. (Methuen, London, 2000).

<sup>17</sup> Clausewitz, *On War*, (Princeton, NJ: Princeton University Press, 1984) 89.

<sup>18</sup> Clausewitz, *On War*, (Princeton, NJ: Princeton University Press, 1984) 89. Ibid.

<sup>19</sup> Clausewitz, *On War*, (Princeton, NJ: Princeton University Press, 1984) 89. Ibid.

Vietnamese noncombatants were murdered, raped, or maimed.<sup>20</sup> Investigations revealed that there were initial cover-ups of the incident and there were clear problems in the communication of orders down the chain of command. The *Peers Report* which concluded in March 1970 stated:

“The task force commander’s order and the associated intelligence estimate issued prior to the operation were embellished as they were disseminated through each lower level of command, and ultimately presented to the individual soldier a false and misleading picture of the Son My area as an armed enemy camp, largely devoid of civilian inhabitants.”<sup>21</sup>

The investigation and writings on the incident suggest a morbid game of “telephone” in which the order in question becomes more and more distorted from its original intent. This concept of intent being lost in translation is all too familiar in stressful situations. Intent needs to be clear and understood in combat. If intent is deliberately programmed into an autonomous machine, then there would be no question as to what the desired endstate is, unlike in the My Lai massacre.

Ultimately, Lieutenant William Calley Jr received the brunt of the blame for the incident and was charged with 22 counts of premeditated murder. During the trial, he stated:

“I was ordered to go in there and destroy the enemy. That was my job that day. That was the mission I was given. I did not sit down and think in terms of men, women, and children. They were all classified as the same, and that's the classification that we dealt

---

<sup>20</sup> For background and information on the My Lai massacre refer to History.com “My Lai Massacre,” *History.com* 2009, accessed May 29, 2017, <http://www.history.com/topics/vietnam-war/my-lai-massacre>.

<sup>21</sup> Lieutenant General William R. Peers, *Report of the Department of the Army Review of the Preliminary Investigation into the My Lai Incident*, (Washington DC: Department of the Army: 1970).

with over there, just as the enemy. I felt then and I still do that I acted as I was directed, and I carried out the order that I was given and I do not feel wrong in doing so.”<sup>22</sup>

Calley’s statement is robotic and unapologetic. He states that he did not distinguish between combatant and noncombatant and that they were “all classified as the same.” Critics of LAWS state that LAWS are not able to distinguish between noncombatants and combatants the way humans can, but the My Lai massacre shows that the “human only” quality can be purposefully omitted. Additionally, Lieutenant Calley was programmed to not distinguish between combatant and noncombatant. Robots may be programmed to distinguish between combatant and noncombatant and if there is a conflict in doing so they can be programmed to not use force.

Soldiers are programmed to suspend emotion and judgment from the moment they are indoctrinated in basic training. Soldiers are molded to be cogs in the war machine: each piece is integral but replaceable. Discipline and conformity is rooted as the foundation in doctrine and training. In that sense, was Calley acting in accordance with how he had been trained? According to him he was ordered to “destroy the enemy” with the understanding that the entire village was filled with enemy. He obeyed those orders literally and without discernment. Or, did his “human-ness” escape and cause him to deviate from the plan and commit the atrocity?

Marlantes offers a different perspective to combat. He states that combat is not a “passionate” affair as Thucydides and Clausewitz would conclude, but the opposite. Marlantes describes combat as “a white heat of total rationality, completely devoid of passion.”<sup>23</sup> He continues that total rationality is the most dangerous quality in combat: “total rationality is an unbalanced and unhealthy state. Logic, devoid of empathy.”<sup>24</sup> He states that this apathy is what

---

<sup>22</sup> Valrie Plaza, *American Mass Murderers*, (New York, NY: Lulu, 2015)

<sup>23</sup> Marlantes, *What it is Like to go to War*, 96.

<sup>24</sup> *Ibid*, 99.

causes atrocities in war. Soldiers suspend emotion, are “numbed” and act robotically (like Calley) in killing. It begs the question, what exactly are the “human only” qualities that policymakers state are imperative in combat? These contrasting perspectives paint a morbid idea: no matter if a human experiences “total rationality” (the Marlantes or Calley idea) or “passion” (the Thucydides or Clausewitz idea) in the heat of combat, ethical decision-making is still difficult. There seems to be no prescription for the correct amount and type of emotion that humans need in combat.

Ethical misconduct continues to be present in the recent War on Terror. Operation IRON TRIANGLE shows how susceptible humans are to the horrors of war. The operation was executed in 2006 during Operation IRAQI FREEDOM and was publicly scrutinized because in the first few hours of the operation two soldiers from Charlie Company 3-187 Infantry Battalion executed three unarmed Iraqi detainees. The soldiers claimed that they were acting on the orders of their squad leader as well as the Brigade Commander, Colonel Michael Steele of *Black Hawk Down* fame. An expose in *The New Yorker* paints a grim picture of the command climate under Colonel Steele.<sup>25</sup> It describes a culture of killing while Colonel Steele trained his soldiers up for their deployment in Tikrit, Iraq, which included staff rides to the morgue as a part of his “Psychological Inoculation of Combat.”<sup>26</sup> Two infantry soldiers, Specialist William Hunsaker and Private First Class Corey Clagett, conducted the executions and were later charged with first degree murder and are currently serving eighteen years in Leavenworth.<sup>27</sup> The investigation revealed that the two soldiers were ordered to kill the Iraqis from orders that could be traced up to the Brigade Commander, Colonel Steele. The soldiers charged with the murder feel that the

---

<sup>25</sup> Raffi Khatchadourian, “The Kill Company,” *The New Yorker*, (2009).

<sup>26</sup> *Ibid.*

<sup>27</sup> *Ibid.*



leaders above them should be held just as culpable. Hunsaker states: “it is not fair for the men above me, the men who gave the orders, to do less time, or none at all.”<sup>28</sup> Although the leaders above those soldiers gave immoral orders, the two soldiers charged *obeyed* those immoral orders.

Operation IRON TRIANGLE conjures the question of culpability in warfare. The soldiers who physically committed the war crimes were the only ones held accountable. Should the leaders have been held just as accountable for giving and passing on illegal, unethical, and immoral orders? If a robot would have committed similar crimes then the leader that authorized the engagement would likely be held fully accountable.

Colonel Michael Steele’s toxic command climate shows the long-term detrimental effects that combat has on a person. Upon arriving in Iraq with his Brigade in 2005, he was the only Brigade Commander to have experienced urban warfare before 9/11.<sup>29</sup> Despite being reprimanded for cultivating a toxic command climate, he is still a respected officer and leader that had consistently been commended by his subordinates, peers, and superiors. He is not remembered today as a war criminal, but his story is a cautionary tale. Colonel Steele’s demeanor and mystique during his command paints the picture of a man desperately trying to cope with a tragic past. One of his senior officers asked him to give a talk about his experiences in Somalia. The exchange is telling:

“... [Steele] said ‘Why would I want to do that?’ And I said ‘Well, I think that there are a lot of good lessons that people could learn from your experiences.’ And he said, ‘If people would read my command philosophy and my training guidance, they’ll know the

---

<sup>28</sup> Ibid.

<sup>29</sup> Ibid.

lessons that I learned. But I have no desire to talk publicly about one of the worst days of my life, and the deaths of eighteen people who were good friends of mine.”<sup>30</sup>

Steele’s comment is representative of many soldiers coping with traumatic experiences in combat. Vonnegut echoes Steele’s reluctance to discuss his experiences: “another reason not to talk about war is that it’s unspeakable.”<sup>31</sup> Ironically, even though Vonnegut has published nonfiction, to include a memoir, the most truthful he is about his experiences in WWII is in his fiction bestseller *Slaughterhouse-Five*. Without the protective façade of fiction, even a literary genius like Vonnegut is uncomfortable with discussing the personal horrors of war. If a professional, bestselling author is unable to articulate combat, how can a military leader be expected to?

Humans are often motivated by a sense of revenge and retaliation that leads to unethical choices. In 2011, a video surfaced of a group of Marines urinating on Taliban corpses. When interviewed in 2013, after he was court-martialed, found guilty, and demoted, the senior Marine had no remorse for his actions and poor example. Sergeant Chamblin states: “These were the same guys that were killing our family, killing our brothers. We’re *human*, who wouldn’t [want to get revenge] if you lost your brother or mother? Wouldn’t you want revenge? Do I regret doing it? Hell no.”<sup>32</sup> Many would not find fault in his motivations and thoughts, but that does not make the actions any less unethical. Nevertheless, Sergeant Chamblin brings up an important fact: humans desire revenge to seek closure after tragedy.

---

<sup>30</sup> Ibid, 6.

<sup>31</sup> Vonnegut, *A Man Without a Country*, 20.

<sup>32</sup> Emphasis added. Nina Golgowski, “Marine filmed urinating on bodies of dead Taliban has no regrets and would do it again.” *New York Daily News*, July 16, 2013, accessed December 31, 2016, <http://www.nydailynews.com/news/national/marine-no-regrets-urinating-taliban-article-1.1399764>

Humans have an innate instinct for self-preservation and a demonstrable desire for revenge. They surge with emotions during the stress of combat. They may thus misinterpret or ignore their orders, like in the My Lai massacre. Such distortions help permit the wartime atrocities described above. Robots have no need for self-preservation, no desire for revenge, and would be unable to misinterpret or ignore orders. Therefore, robots are less likely to commit atrocities fueled by passion and vengeance. Critics of LAWs state that morality cannot be delegated, but in the case of Operation IRON TRIANGLE, *immorality* was delegated and executed down to the lowest level. A robot would be programmed with the most up to date Rules of Engagement and would not have intentionally killed three unarmed males. The above cases illustrate significant flaws in human judgment and the catastrophic consequences of leading in stressful situations, like combat, as well as post-traumatic stress disorder. A robot would not be psychologically affected by the horrors of combat.

In addition to unreliable behavior, human soldiers are expensive. The defense budget is 16% of the national budget as of March 2016.<sup>33</sup> The Fiscal Year (FY) defense budget is \$523.9 billion.<sup>34</sup> One third of that amount is dedicated to personnel and maintenance. Consider that with pay, housing allowance, and free healthcare for members and dependents the average enlisted member receives \$59,000 annually and the average officer receives \$108,000.<sup>35</sup> There are currently 1,137,916 active enlisted members and 292,079 active officers.<sup>36</sup> Based on the average salary, compensation and entitlements account for \$98.681 billion or 18% of the defense budget.

---

<sup>33</sup> Center on Budget and Policy Priorities, "Policy Basics: Where Do Our Federal Tax Dollars Go?" March 4, 2016, accessed January 1, 2017, <http://www.cbpp.org/research/federal-budget/policy-basics-where-do-our-federal-tax-dollars-go>.

<sup>34</sup> Kimberly Amadeo, "U.S. Military Budget: Components, Challenges, Growth," *Thebalance.com*, October 26, 2016, accessed on January 1, 2016 <https://www.thebalance.com/u-s-military-budget-components-challenges-growth-3306320>.

<sup>35</sup> *Ibid.*

<sup>36</sup> Defense Manpower Data Center "DoD Personnel, Workforce Reports & Publications," *DMDC*, accessed April 2017, [https://www.dmdc.osd.mil/appj/dwp/dwp\\_reports.jsp](https://www.dmdc.osd.mil/appj/dwp/dwp_reports.jsp).

The defense budget does not include retiree or other veteran pensions that amounts to 8% of the total national budget. Budget analysts are gravely concerned with the rising cost of entitlements and compensation and predict that “within the next 10 years, the vast majority of DOD’s budget will be swallowed up by just two categories: personnel and maintenance.”<sup>37</sup> Something has to change in order to prevent this looming crisis.

Former Secretary of Defense Robert Gates was famously quoted as saying that military entitlements, specifically healthcare, are “eating us alive.”<sup>38</sup> This was in 2010 and the situation now is no less dire. 2010 is significant because it was after the Iraq surge and early in the Afghanistan-surge. Wartime preparations are just one illustration of the rising costs that Secretary Gates was referring to. A typical deploying military member goes through a deliberate process in preparation for deployment. This process varies slightly between services. Consider the Army’s Soldier Readiness Process (SRP). The SRP is a time-consuming and expensive process that occurs prior to and immediately following a deployment, no matter the location or length of deployment. The SRP process evaluates the soldier’s rating on the PULHES factor which stands for “physical stamina, upper body, lower body, hearing, eyes, and psychiatric.”<sup>39</sup> The soldier can also expect to receive immunizations, the taking of a blood sample, electrocardiography (if needed), and a dental exam. This process is conducted for every deployable soldier. There are most likely ways to make this process more cost efficient but decreasing these requirements would greatly impact the overall readiness of the deploying army.

---

<sup>37</sup> Jared Serbu, “Analysis: Pay, benefits, O&M will swallow entire DoD budget by 2024,” *Federal News Radio*, (April 8, 2013, accessed January 1, 2017, <http://federalnewsradio.com/sequestration/2013/04/analysis-pay-benefits-om-will-swallow-entire-dod-budget-by-2024/>)

<sup>38</sup> Craig Whitlock, “Pentagon Asking Congress to hold back on generous increases in troop pay,” *Washington Post*, May 8, 2010, accessed on January 2, 2017, <http://www.washingtonpost.com/wp-dyn/content/article/2010/05/07/AR2010050703188.html>.

<sup>39</sup> Department of the Army, *Army Regulation 600-60 Physical Profiling Evaluation System*.

A robot would need basic and thorough maintenance but would likely not need the amount of preventive and operational maintenance that a soldier requires to deploy.

The real cost of deploying military members occurs when they are wounded or killed in action. When a service member dies while on active duty, the Department of Defense pays a onetime lump sum death gratuity of \$100,000 to the next of kin.<sup>40</sup> This does not include the \$400,000 life insurance plan, or remaining compensation payout. This cost is minimal compared to when a soldier is seriously wounded. When a service member is wounded in action or injured while on active duty, military healthcare benefits provides for complete treatment. If the service member cannot continue serving due to their injury, then the service member goes through the Medical Evaluation Board (MEB) process to determine if he or she is eligible for medical retirement.<sup>41</sup> This process can stretch up to two years. During that time, the service member remains on active duty but in a non-deployable status, and sometimes in a rehabilitation center or hospital. Sometimes the service member is still technically assigned to the unit that they were in when they were injured or wounded; this causes that unit to have a personnel slot filled by a service member that is not physically in the unit, which negatively affects the readiness of that unit. If a service member is medically retired, he or she will receive a pension and healthcare benefits for the rest of their life no matter how long their initial term was. So, a service member could have served one day on active duty, got injured, and will then receive money for life from the government. This is the nation's obligation to its service members, but it is expensive.

A robot may be much less expensive in the long run. If a robot was destroyed in the line of duty there would be no death gratuity paid because there would be no next of kin. There

---

<sup>40</sup> MyArmyBenefits.us.army.mil, accessed on January 2, 2017  
[http://myarmybenefits.us.army.mil/Home/Benefit\\_Library/Federal\\_Benefits\\_Page/Death\\_Gratuity\\_.html](http://myarmybenefits.us.army.mil/Home/Benefit_Library/Federal_Benefits_Page/Death_Gratuity_.html).

<sup>41</sup> MilitaryDisabilityMadeEasy.com, 2013, accessed on January 2, 2017,  
<http://www.militarydisabilitymadeeasy.com/mebprocess.html>.

would be no life insurance paid. If a robot was damaged there would be no costly hospital stay, no lengthy Medical Evaluation Board process, and no lifetime medical retirement benefits. Most importantly, there would be no one to mourn the robot's death or have to care for the robot during its rehabilitation.

The economic costs of losing soldiers and wounded soldiers pales in comparison to the societal costs. The psychological consequences of war are often costlier than the physical costs. A 2016 Veteran's Affairs study found that 20 veterans commit suicide a day. The risk of suicide for veterans is 21 percent higher when compared to civilian adults. The civilian suicide rate rose 23.3% between 2001 and 2014 while the veteran rate rose 32%. More disturbing is the female veteran suicide rate which rose 85% during that time compared to their civilian counterparts which rose 40%.<sup>42</sup> Suicide rates are at all an all-time high. It is an epidemic. This human cost could be alleviated by substituting robots for many of the combat roles now filled by their inherently fragile human counterparts.

Posttraumatic Stress Disorder (PTSD) is also more common in the military as compared to the civilian population. According to a recent Veteran Affairs study, approximately 7-8% of the population will have PTSD at some point in their lives. The veteran rate is higher and varies by war. Approximately 30% of Vietnam veterans were diagnosed with PTSD according to the National Vietnam Veterans Readjustment Study (NVVRS).<sup>43</sup> Approximately 20% of Operation Iraqi Freedom and Operation Enduring Freedom veterans have been diagnosed per year.<sup>44</sup> The

---

<sup>42</sup> Leo Shane III and Patricia Kime, "New VA study finds 20 veterans commit suicide each day," *Military Times*, July 2016, <http://www.militarytimes.com/story/veterans/2016/07/07/va-suicide-20-daily-research/86788332/>.

<sup>43</sup> Department of Veteran's Affairs, "PTSD: National Center for PTSD," <http://www.ptsd.va.gov/public/PTSD-overview/basics/how-common-is-ptsd.asp>.

<sup>44</sup> *Ibid.*

latter number will most likely rise as more cases are diagnosed. PTSD can and does affect a service member's ability to do their job and can lead to a service member to be medically retired.

The societal burden of warfare is costly and will continue to rise if the nation continues to rely heavily on large numbers of troops. A recent study claimed that veterans are 50% more likely to become homeless as compared to non-veterans. The study stated that the causes were due to: "poverty, lack of support networks, and dismal living conditions in overcrowded or substandard housing."<sup>45</sup> While those reasons are the immediate causes for homelessness they are indicative of addressing a symptom and not the actual problem. Veterans also struggle with the fact that after their uniformed service many do not have translatable skills that can be used in a non-wartime environment. Using robots would require soldiers to be able to troubleshoot and maintain the robots resulting in skills that are desired by many high-tech corporations. Additionally, it would decrease the number of soldiers needed for jobs that are not as applicable in a non-wartime environment such as route clearance, explosive ordnance disposal, and base security.

In conclusion, humans are vulnerable to the detrimental effects of warfare while robots are not. The physiological effects of combat trauma may render a human physically and psychologically unable to make sound decisions. If employed in battle, robots will not be as unethical as humans have the potential to be. Humans are emotional, desire revenge, and are prone to commit atrocities as a result. Human service members are also expensive, especially when they are killed or wounded. The psychological impacts of war are unavoidable and destructive. Robots have no need for revenge, are unemotional, and are less expensive than

---

<sup>45</sup> Greendoors.org, "Veteran Homelessness Facts," accessed on 05 March 2017, <http://www.greendoors.org/facts/veteran-homelessness.php>, accessed on 05 March ,2017.

human soldiers. Using robots on the battlefield will reduce economic and societal costs and save lives.



### III – Competing in the Global Arms Race

Human nature is violent and war is never final. Critics claim that developing and employing lethal autonomous weapons will create a global arms race; however, history affirms that the arms race is perpetual. Therefore, it is necessary that the United States stays ahead to create and enforce the “rules.” There are many instances in history that illustrate a nation navigating unknown territory in warfare, resulting in unethical choices made and more lives lost. That is why it is not only important to develop autonomous, intelligent weapons, but to understand their capabilities and employ them properly so that international norms and standards can be established and enforced. Other nations, such as Israel and Russia, are already accomplishing this. Does America want those international standards designed by another nation?

The existence of armed forces cultivates the need for competing nations to continue to grow and develop their own defense forces. As Immanuel Kant argued: “Standing armies shall in time be totally abolished. For they incessantly menace other states by their readiness to appear at all times prepared for war; they incite them to compete with other in the number of armed men, and there is no limit to this.”<sup>46</sup> The logic is, if no nation has an Army, then no Army can invade another nation; therefore, peace will be “perpetual.” The logic is commendable, but the call to action is not likely as it would involve a universal and verifiable commitment to worldwide disarmament.

Parts of the United States Constitution were developed within the Kantian philosophy. Article II, Section 8 states that the role of Congress is: “To raise and support Armies, but no Appropriation of Money to that Use shall be for a longer Term than two Years; To provide and

---

<sup>46</sup> Immanuel Kant, *Perpetual Peace: A Philosophical Sketch*, 1795.

maintain a Navy.”<sup>47</sup> The Founding Fathers saw the necessity of a maintained Navy but wanted to reconsider the status of the Army every two years. A reason for maintaining a Navy but not an Army is because the Navy does not have to be a lethal defense force, and it is necessary for trade. An Army serves little economic purpose; it is a purely lethal tool. The Founding Fathers’ anxiety of the future of the nation is apparent throughout the Constitution and the subtle plans to abolish the Army are an example of that anxiety. America was born from a Revolution; therefore, a standing Army could overthrow a government. The Founding Fathers lived that reality. Furthermore, the US Navy is representative of the cutting edge of technology. Without deep investment in technology, the Navy would not exist. The naval theorist Wayne Hughes states in one of his “Six Cornerstones:” “We bow to the great god technology and honor him as a jealous deity who will wreak vengeance on all apostates.”<sup>48</sup> A Navy is only as good as the quality of its ships.

Over the past 60 years, even during times of peace, the number of US active duty armed forces has not fallen below 1.3 million troops, or .4 percent, for the current population of 322,762,018.<sup>49</sup> Russia currently boasts a 766,055 active duty military, or .5 percent, for its 142,423,773 population.<sup>50</sup> While the United States’ values and foundation are rooted in the Kantian philosophy for perpetual peace, it is not feasible that that ideal will ever come to fruition given the current global situation.

The existence of a standing army and offensive capabilities is an enduring reality; therefore, it is in the United States’ interest to ensure that the capabilities employed are effective

---

<sup>47</sup> The Constitution of the United States of America, Article II, Section 8.

<sup>48</sup> Wayne P. Hughes, Jr, *Fleet Tactics and Coastal Combat* (Annapolis: Naval Institute Press, 2000), 33.

<sup>49</sup> David Coleman, “US Military Personnel 1954-2014,” *Research: History in Pieces*, (assessed on January 27 2017), <http://historyinpieces.com/research/us-military-personnel-1954-2014>

<sup>50</sup> Global Firepower, “Russia Military Strength,” (assessed on January 27 2017), [http://www.globalfirepower.com/country-military-strength-detail.asp?country\\_id=Russia](http://www.globalfirepower.com/country-military-strength-detail.asp?country_id=Russia)

and sound. Unfortunately, the United States has set a precedent for condemning an act of war and then later executing it, poorly. History has shown that strategies once deemed unethical may nevertheless be employed later for reasons of passion and a desire to achieve military objectives faster. A prime example is America's use of unrestricted submarine warfare during WWII. Woodrow Wilson condemned the German's use of unrestricted submarine warfare in WWI after the sinking of the passenger ship *Lusitania*, which killed 1,198 noncombatants, including 128 Americans.<sup>51</sup> When the Germans used the strategy again in 1917, America made good on its threat and entered the war on the Allies' side. The United States demonstrated that the use of unethical strategies would not be tolerated and deterring such strategies was a vital interest. Wilson had other reasons to enter the war but unrestricted submarine warfare was the best way to garner public support with the deaths of 128 Americans who perished on the *Lusitania* fresh on their minds. However, after Japan bombed Pearl Harbor "it took just six hours for the United States military to disregard decades of legal and ethical norms and order unrestricted submarine warfare against Japan."<sup>52</sup> Yet because the United States had condemned the practice for so long, the US Navy's submariners were not properly trained or conditioned to conduct it and it took nine months to be effective. The German employment of the same strategy was very effective against the British in one month in 1917. In theory, WWII could have ended significantly earlier because once the US Navy became proficient at unrestricted submarine warfare it was the most proficient navy to ever use the strategy.<sup>53</sup>

---

<sup>51</sup> Hew Strachan, *The First World War* (New York, NY: Penguin Books, 2003).

<sup>52</sup> Matthew Rosenberg and John Markoff, "The Pentagon's 'Terminator Conundrum': Robots That Could Kill on their Own," *The New York Times*, October 26, 2016..

<sup>53</sup> George W. Baer, *One Hundred Years of Sea Power: The US Navy, 1890-1990* (Stanford: Stanford University Press, 1994).

Furthermore, just because a form of warfare is accepted internationally does not mean it is ethical or should be employed. The strategic bombing campaign conducted during WWII is an example of an accepted form of warfare that was later deemed by most observers as unethical. The firebombing of Dresden in 1945 resulted in more civilian loss of life than over eight times the amount lost in the 9/11 attacks.<sup>54</sup> Strategic bombing deliberately targeted civilian populations and the devastating results were generally lauded and praised as victorious.<sup>55</sup> While war is violent and often grotesque, the international community has since come to a consensus that targeting noncombatants is in violation of the Law of Armed Conflict.<sup>56</sup>

Strategic bombing and unrestricted submarine warfare are arguably unethical strategies that were employed *during* war, when stakes are high and emotions are erratic. The leaders and politicians that decided to employ those strategies made what they considered the best decision with the available information at that time, unknowing of future victory or defeat. As Clausewitz says:

If the critic wishes to distribute praise or blame, he must certainly try to put himself exactly in the position of the commander; in other words, he must assemble everything the commander knew and all the motives that affected his decision and ignore all that he could not or did not know, especially the outcome.<sup>57</sup>

Because history gives the luxury of hindsight to the present time, an important lesson learned from these episodes is that questionable practices need to be examined and tested *prior* to

---

<sup>54</sup> Initial estimates of the firebombing stated that up to 100,000 people died. An official 2010 German report concluded that up to 25,000 people (mostly civilian) were killed. The Telegraph, "The firebombing of Dresden: archive footage," (Assessed on April 03, 17), <http://www.telegraph.co.uk/news/2016/03/21/the-firebombing-of-dresden-archive-footage/>.

<sup>55</sup> William O'Neill, *A Democracy at War: America's Fight at Home and Abroad in World War II* (New York: The Free Press, 1993) 301-319.

<sup>56</sup> US Department of Defense, General Counsel, *DoD Law of Warfare Manual*, 2015.

<sup>57</sup> Carl von Clausewitz, *On War* (Princeton: Princeton University Press, 1976), 164.

entering conflict. That way the full weight of capabilities of those questionable practices, and their consequences, can be considered thoughtfully. In that sense, lethal autonomous weapons need to be fully developed now so that their capabilities are understood and so they are employed in the best way.

Currently only two nations, the US and UK, have a policy regarding LAWs, but that does not mean that other nations are not thinking about them. Quite the opposite.<sup>58</sup> At the 2014 summit on lethal autonomous weapons, only five of eighty-seven countries voted in favor of banning lethal autonomous weapons: Cuba, Pakistan, Egypt, Ecuador, and the Vatican.<sup>59</sup> Incidentally, none of these countries are close to developing or acquiring autonomous weapons, but other nations have that capability and are willing to use it.

The United States' policy on autonomous weapons is vague at best and over five years old. It states that autonomous weapons "shall be designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force."<sup>60</sup> Additionally it states that human-supervised autonomous weapons may be used for targeting non-human targets.<sup>61</sup> But what is the meaning of "appropriate levels of human judgment"? The term defies quantification and it can be interpreted in several ways. Judgment could entail a "human-on-the-loop" scenario in which a human supervises the targeting process and can intervene at any time. Or judgment could be interpreted as the judgment involved in the programming process only. Both interpretations could result in different outcomes and are not the only way that this directive can

---

<sup>58</sup> For the US policy reference Department of Defense, "Autonomy in Weapon Systems: Directive 2012b," (Washington DC: Department of Defense, 2012).

<sup>59</sup> Adrienne Jeffries, "Only Five Countries actually want to ban Killer Robots," *Theverge.com*, May 16, 2014, accessed on January 29, 2016, <http://www.theverge.com/2014/5/16/5724538/what-happened-at-the-un-killer-robot-debate>.

<sup>60</sup> Department of Defense, "Autonomy in Weapon Systems: Directive 2012b" (Washington DC: Department of Defense, 2012).

<sup>61</sup> DOD Directive 2012b.

be interpreted. The directive needs to be updated with key terms defined to prevent confusion and misinterpretation.

The United States came close to employing autonomous weapons but ultimately hesitated. The Special Weapons Observation Reconnaissance Direct-action System (SWORDS) was an unmanned ground vehicle (UGV) that was deployed to Iraq in 2007. There is significant controversy surrounding the fate of these three robots as they reportedly never left their forwarding operating bases (FOBs). The Army program manager, Kevin Fahey, publicly stated that “the gun started moving when it was not intended to move.”<sup>62</sup> This comment was strewn across the media with provocative reports that “ground-crawling US war robots armed with machine guns” had “turned on their fleshy masters almost at once.”<sup>63</sup> The facts surrounding this attempted “kill-droid rebellion” are vague and mysterious and the fact that the robots were never employed again stirred up more rumors.<sup>64</sup> Fahey attempted to explain the reason for the Army’s reluctance: “once you’ve done something that’s really bad, it can take 10 or 20 years to try it again.”<sup>65</sup> The United States does not want to haphazardly employ a devastating weapon without fully understanding the effects. Unfortunately, other countries do not follow that school of thought.

Russia demonstrated that it is able and willing to use fully autonomous weapons. In 2013, Russia introduced its “mobile robot complex” developed by the Izhevsk Radio Plant. The “mobile robot complex” will protect Russia’s ballistic missile installations with a 12.7-millimeter heavy machine gun, speeds of up to 30mph, ten hours’ worth of battery life and a up to a week-

---

<sup>62</sup> Erik Sofge, “The Inside Story of the SWORDS Armed Robot ‘Pullout’ in Iraq: Update,” *Popular Mechanics*, October 30, 2009, accessed on January 29, 2017, <http://www.popularmechanics.com/technology/gadgets/a2804/4258963/>.

<sup>63</sup> Lewis Page, “US war robots in Iraq ‘turned guns’ on fleshy comrades,” *The Register*, April 11, 2008, accessed on January 29, 2017, [http://www.theregister.co.uk/2008/04/11/us\\_war\\_robot\\_rebellion\\_iraq/](http://www.theregister.co.uk/2008/04/11/us_war_robot_rebellion_iraq/)

<sup>64</sup> Page, “US war robots in Iraq ‘turned guns’ on fleshy comrades,”

<sup>65</sup> Sofge, “The Inside Story of the SWORDS Armed Robot ‘Pullout’ in Iraq: Update,”

long sleep mode.<sup>66</sup> These robots are autonomous with the ability to “detect and destroy targets, without human involvement.”<sup>67</sup> Russia’s Deputy Prime Minister, Dmitry Rogozin, discussed projects in development that “include a remote controlled android with driving and shooting skills” and a system capable of “delivering strikes on its own.”<sup>68</sup> Rogozin also boasted that “someday soon, one Russian soldier will do the work that takes five or 10 soldiers today, which would be impossible without advanced robots.”<sup>69</sup> Rogozin described employing both a human-on-the-loop and human-out-of-the-loop scenario which demonstrates that Russia does not have an issue with removing the human from the loop.

Israel has employed a fully autonomous weapon and has sold it to other nations in the Middle East. Israel Aerospace Industries’ (IAI) *Harop* is an upgraded version of the anti-radiation drone, *Harpy*, with significant differences. The *Harop* can loiter longer than its predecessor and can find, identify, attack, and destroy targets autonomously. While the *Harop* is an “autonomous platform operation” Israel keeps a “man-in-the-loop for attack” for “avoiding collateral damage.”<sup>70</sup> Just because Israel retains a man-in-the-loop before kinetic use does not mean that other countries will. In June 2015, IAI demonstrated *Harop*’s capabilities in a series of tests for “anonymous foreign buyers.”<sup>71</sup> In April 2016, the drone was spotted in the skies over

---

<sup>66</sup> Steven Kotler, “Say Hello to Comrade Terminator: Russia’s Army of Killer Robots,” *Forbes*, June 12, 2014, accessed on January 29, 2017, <http://www.forbes.com/sites/stevenkotler/2014/06/12/say-hello-to-comrade-terminator-russias-army-of-killer-robots/#3d70969a7046>.

<sup>67</sup> David Hambling, “Armed Russian Robocops to Defend Missile Bases,” *Technology News*, April 23, 2014, accessed on January 29, 2017, <https://www.newscientist.com/article/mg22229664-400-armed-russian-robocops-to-defend-missile-bases/#.U3Z4DuZdXE4>.

<sup>68</sup> Kotler, “Say Hello to Comrade Terminator: Russia’s Army of Killer Robots”

<sup>69</sup> David Hambling, “Russia Wants Autonomous Fighting Robots, and Lots of Them,” *Popular Mechanics*, May 12 2014, accessed on January 29, 2017, <http://www.popularmechanics.com/military/a10511/russia-wants-autonomous-fighting-robots-and-lots-of-them-16787165/>.

<sup>70</sup> Harop Fact Sheet, “Harop” *Israel Aerospace Industries*, accessed on January 29, 2017, [http://www.iai.co.il/2013/36694-46079-EN/Business\\_Areas\\_Land.aspx](http://www.iai.co.il/2013/36694-46079-EN/Business_Areas_Land.aspx).

<sup>71</sup> Jack Moore, “Israeli Company Tests ‘Suicide Drones’ for Secret Foreign Buyers,” *Europe Newsweek*, June 8, 2015, accessed on January 29, 2017, <http://europe.newsweek.com/israeli-company-tests-suicide-drones-secret-foreign-buyers-328396>.

Nagorno-Karabakh in the Caucasus and it allegedly targeted and attacked a bus full of Armenian volunteers killing seven of them. The Azerbaijani army claimed that it was responsible for the attack and that it was indeed using the Israeli *Harop*.<sup>72</sup> There is no available information regarding whether there was a human-in-the-loop during the time of the engagement. This example illustrates that the technology is available and other countries are willing to use it in warfare.

If other nations are already paving the way for the acceptable use of lethal autonomous weapons then rogue nations and non-state actors will likely not hesitate to use them. The probability of a non-state actor acquiring a LAW is not unrealistic. In October 2016, an IED drone employed by ISIS killed two Kurdish soldiers and injured two French Commandos.<sup>73</sup> While the IED drone was not suspected of being autonomous, it illustrates that non-state actors have the capacity to acquire new lethal technologies as well as willingness to use them. If available, it is likely that non-state actors will employ lethal autonomous weapons on the battlefield without reluctance. Furthermore, rogue nations could potentially sell (or give) autonomous weapons to a non-state actor to see what the effects of the weapon are on the battlefield and what the international reaction is.

In conclusion, the lethal autonomous weapons arms race is in progress and the United States needs to stay ahead. History has shown that reluctance to employ existing controversial strategies and technologies has resulted in flawed execution and more casualties. On the contrary, waiting to decide to employ controversial strategies *during* conflict has resulted in

---

<sup>72</sup> Sue Surkes, "Azerbaijan said using Israeli drones against Armenians," *The Times of Israel*, April 7, 2016, accessed on January 29, 2017, <http://www.timesofisrael.com/azerbaijan-said-using-israeli-drones-against-armenians/>.

<sup>73</sup> The Guardian, "ISIS Booby-trapped drone kills troops in Iraq, officials say," October 12, 2016, accessed on May 29, 2017, <https://www.theguardian.com/world/2016/oct/12/exploding-drone-sent-by-isis-allies-kills-and-wounds-troops-in-iraq-report>.



some of warfare's greatest atrocities. The United States needs to continue to develop, test and employ lethal autonomous weapons so that those difficult decisions are not made in a vacuum.

## IV – Another Approach

Some critics may argue that like drones, airpower, and cruise missiles, employing Lethal Autonomous Weapons will lower the bar to entry into war. Technology that enables lethal force to be projected over long distances without deploying ground troops gives policymakers new military options and leads to what Michael Handel coined the “tacticization of strategy.”<sup>74</sup> This idea states that the availability of weapon systems leads to short-term victories without realizing or developing a long-term strategy. This concept is illustrated in Operation DESERT FOX and the use of drone strikes during the Obama administration.

During Operation DESERT FOX, the Clinton Administration attempted to “degrade” Saddam’s military capabilities using cruise missile barrages and air strikes. While most of the military targets were damaged or destroyed, the administration’s political objectives were so vague and broad it would have been impossible to not accomplish them. Consequently, Saddam’s defiance of the UN effort increased and some US allies even abandoned the effort to contain Saddam.<sup>75</sup> Clinton’s political objectives were entirely dependent on military capabilities with no regard to the overall strategy of a more stable Middle East. The Clinton administration’s strategy ignored the reciprocal nature of war while it expected a military solution to solve a political problem.

The Obama administration executed a record number of drone strikes targeting terrorist leaders. While the drone strikes were successful in their immediate operational aim of killing terrorist leaders, the strikes arguably created martyrs for the terrorist’s cause. Additionally, the leaders that were killed were ultimately replaced, and the respective terrorist organizations were

---

<sup>74</sup> Michael Handel, *Masters of War: Classic Strategic Thought* (London: Routledge, 2001), 255.

<sup>75</sup> Mark Conversino, “Operation DESERT FOX: Effectiveness with Unintended Effects,” *Air & Space Power Journal- Chronicles Online*, July 13, 2005.

not significantly impacted.<sup>76</sup> Both DESERT FOX and the drone campaign illustrate that policymakers are likely to rely on technological answers for military and political problems. Employing LAWS will only compound this epidemic. No politician wants to propose deploying ground troops, and technological advances in drones, cyber, and airpower make that possible. The Revolution in Military Affairs (RMA) has successfully created a “win without fighting” mentality.<sup>77</sup> Lowering the bar to entry into war may initially save lives but ultimately may only delay escalation. Relying on operational success as a substitute for a comprehensive strategy will not achieve political objectives.

Furthermore, employing Lethal Autonomous Weapons in warfare violates human dignity. A machine, no matter how sophisticated, could never fully appreciate the value of human life and therefore should not be allowed to make life-or-death decisions. Human Rights Watch and ICRC conducted a survey and found that only 34% of respondents felt that “humans should always be the one to make life/death decisions.”<sup>78</sup> Nobel Laureate and member of the Campaign to Stop Killer Robots, Jody Williams, stated: “Where is humanity going if some people think it’s OK to cede the power of life and death of humans over a machine?”<sup>79</sup> If humans allow machines to kill other humans, humanity will not be the same.

Finally, there is no surefire way to safeguard LAWS from hacking and being used against their master. Cyberterrorism has increased, and the fact that non-state actors and lone wolves can

---

<sup>76</sup> Audrey Kurth Cronin, “‘The War on Terrorism’: What Does It Mean to Win?” *Journal of Strategic Studies* 37, no. 2 (2014).

<sup>77</sup> Scott Stephenson, “The Revolution in Military Affairs: 12 Observations on an Out-of-Fashion Idea,” *Military Review*, May-June 2010.

[http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview\\_20100630\\_art007.pdf](http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview_20100630_art007.pdf)

<sup>78</sup> Human Rights Watch and ICRC, “Making the Case: The Dangers of Killer Robots and the Need for a Preemptive Ban,” December 9, 2016, accessed on March 15, 2017,

[https://www.hrw.org/sites/default/files/report\\_pdf/arms1216\\_web.pdf](https://www.hrw.org/sites/default/files/report_pdf/arms1216_web.pdf)

<sup>79</sup> Human Rights Watch and ICRC, “Making the Case: The Dangers of Killer Robots and the Need for a Preemptive Ban,” 22.

utilize cyberspace to achieve their objectives at low cost is chilling. The idea that a LAW could be hijacked and potentially used against its masters is a real possibility.

The above arguments against employing LAW are valid reasons to be hesitant. However, there are a few points to consider in juxtaposition with them. The “tacticization of strategy” is a problem at the higher levels of government. However, this issue has been a problem long before the idea of LAWs has been considered. The “tacticization of strategy” or the idea that technology could lower the bar to entry into war is not the problem, it is only the symptom of the problem. The problem is the misconception that technology wins wars. LAWs may contribute to that way of thinking but banning them will not make it go away.

To say that LAWS violate human dignity because machines should not be able to make those decisions is hypocritical. With that logic, human dignity has been violated since man invented *any* lethal weapon: the atom bomb, the airplane, the gun, the arrow. These weapons remove the human from directly killing another human. And while a human makes the decision to employ them, there is no way of knowing for sure if others will be hurt or killed when they are employed. In that sense, the only way to restore “human dignity” in warfare is to forego using any weapons and to only kill combatants using hand-to-hand combat.

While there probably will never be certainty in protecting LAWS from being hacked that should not prevent the US from employing them. For example, there is no guarantee that a plane will not malfunction when it flies but that does not prevent people from flying in them or being used in warfare. There is always risk when conducting warfare but it should be calculated and mitigated.

## V – Recommendations and Conclusions

There are several actions that the government must take regarding Lethal Autonomous Weapons. First, the United States needs to revise and adopt a new policy regarding Autonomous Weapons. The policy needs to be specific and clearly articulate the objective when employing these weapons. The policy may need to be classified to be able to articulate the appropriate detail but an unclassified executive summary should be published so that other nations (to include adversaries) are aware of the US stance.

Testing and development of these weapons should be encouraged. Once an adequate robot is approved, it needs to be employed on the battlefield. Initial areas to start employing would be resupply (most likely by air), route clearance, and certain underwater missions. This way three domains are tested and in missions that are dangerous to soldiers and do not require interacting with the local populace.

A LAW cannot be held accountable for violations of ethical norms or ROE because it is inanimate. A human should be overall responsible for LAWS employed and will be held accountable if the LAW violates the Rules of Engagement or LOAC. When employing a LAW results in a civilian casualty or unintended death or injury, a thorough investigation must be conducted. The investigation must determine if the blame rests on the human commander that employed the LAW or the programmer that designed the LAW. This would ensure adherence to ethical norms from the development and testing phase of LAWS through employment.

In conclusion, the US should lead the effort to employ Lethal Autonomous Weapons in warfare. As other nations are already employing LAWS, the US needs to utilize them so that they are fully understood. This understanding and experiencing is necessary to establish international norms and treaties. As a superpower, it is the United States' burden to set the

example in employing new technology in accordance with international norms. Finally, LAWS should be employed in warfare because they will save money and most importantly, lives.

## Bibliography

- Amadeo, Kimberly. "U.S. Military Budget: Components, Challenges, Growth." *Thebalance.com*, October 26, 2016. Accessed January 1, 2016, <https://www.thebalance.com/u-s-military-budget-components-challenges-growth-3306320>.
- American Heritage Dictionaries Eds. Fight-or-Flight response. In *American Heritage Dictionary of Medicine*. Boston, MA: Houghton Mifflin.
- Anderson, David L. editor. *Facing My Lai: Moving Beyond the Massacre*. Lawrence, Kansas: University Press of Kansas, 1998.
- Department of the Army, *Army Regulation 600-60 Physical Profiling Evaluation System*.
- Baer, George W. *One Hundred Years of Sea Power: The US Navy, 1890-1990*. Stanford: Stanford University Press, 1994.
- Cannon, Walter Bradford. "Bodily Changes in Pain, Hunger, Fear and Rage." *The American Journal of Psychology*, 42, no. 2 (April 1930): 322-25.
- Center on Budget and Policy Priorities. "Policy Basics: Where Do Our Federal Tax Dollars Go?" March 4, 2016. Accessed January 1, 2017, <http://www.cbpp.org/research/federal-budget/policy-basics-where-do-our-federal-tax-dollars-go>.
- Clausewitz, Carl von. *On War*. Princeton, NJ: Princeton University Press, 1984.
- Coleman, David. "US Military Personnel 1954-2014." *Research: History in Pieces*. Retrieved on January 27, 2017 <http://historyinpieces.com/research/us-military-personnel-1954-2014>
- The Constitution of the United States of America, Article II, Section 8.
- Department of Defense. "Autonomy in Weapon Systems: Directive 2012b." Washington DC: Department of Defense, 2012.
- Department of Defense, General Counsel. *DoD Law of Warfare Manual*. Washington DC: Department of Defense 2015.
- Global Firepower. "Russia Military Strength." Retrieved on January 27, 2017, [http://www.globalfirepower.com/country-military-strength-detail.asp?country\\_id=Russia](http://www.globalfirepower.com/country-military-strength-detail.asp?country_id=Russia)
- Golgowski, Nina. "Marine Filmed Urinating on Bodies of Dead Taliban has no Regrets and Would do it Again." *New York Daily News*. July 16, 2013. Accessed December 31, 2016, <http://www.nydailynews.com/news/national/marine-no-regrets-urinating-taliban-article-1.1399764>.
- Grossman, Lieutenant Colonel Dave. *On Killing: The Psychological Cost of Learning to Kill in War and Society*. New York, NY: Little, Brown and Company: 2009.

- Hambling, David. "Armed Russian Robocops to Defend Missile Bases." *Technology News*. April 23, 2014. Accessed January 29, 2017, <https://www.newscientist.com/article/mg22229664-400-armed-russian-robocops-to-defend-missile-bases/#.U3Z4DuZdXE4>.
- Hambling, David. "Russia Wants Autonomous Fighting Robots, and Lots of Them." *Popular Mechanics*. May 12 2014. Accessed January 29, 2017, <http://www.popularmechanics.com/military/a10511/russia-wants-autonomous-fighting-robots-and-lots-of-them-16787165/>.
- Harop Fact Sheet. "Harop." *Israel Aerospace Industries*. Accessed January 29, 2017, [http://www.iai.co.il/2013/36694-46079-EN/Business\\_Areas\\_Land.aspx](http://www.iai.co.il/2013/36694-46079-EN/Business_Areas_Land.aspx).
- Hirshkowitz, Max. "National Sleep Foundation's Sleep Time Duration Recommendations: Methodology and Results Summary." *Journal of the National Sleep Foundation*. 1, no. 1 (March 2015). Accessed December 31, 2016, <http://www.sleephealthjournal.org/article/S2352-7218%2815%2900015-7/fulltext#s0010>.
- Hughes, Jr, Wayne P. *Fleet Tactics and Coastal Combat*. Annapolis: Naval Institute Press, 2000.
- Jeffries, Adrienne. "Only Five Countries Actually Want to Ban Killer Robots." *Theverge.com*. May 16, 2014. Accessed January 29, 2016, <http://www.theverge.com/2014/5/16/5724538/what-happened-at-the-un-killer-robot-debate>.
- Kant, Immanuel. *Perpetual Peace: A Philosophical Sketch*. 1795.
- Khatchadourian, Raffi. "The Kill Company." *The New Yorker*. (2009).
- Kotler, Steven. "Say Hello to Comrade Terminator: Russia's Army of Killer Robots." *Forbes*. June 12, 2014. Accessed on January 29, 2017, <http://www.forbes.com/sites/stevenkotler/2014/06/12/say-hello-to-comrade-terminator-russias-army-of-killer-robots/#3d70969a7046>.
- Lee, Timothy B. "Artificial Intelligence is Getting More Powerful and it's About to be Everywhere," *Vox*, May 18, 2017. Accessed May 29, 2017, <https://www.vox.com/new-money/2017/5/18/15655274/google-io-ai-everywhere>.
- Marlantes, Karl. *What it is Like to go to War*. New York: Grove Press, 2011.
- McDonough, James R. *Platoon Leader: A Memoir of Command in Combat*. New York, NY: Random House, 1985.
- MilitaryDisabilityMadeEasy.com. 2013. Accessed January 2, 2017, <http://www.militarydisabilitymadeeasy.com/mebprocess.html>.
- Moore, Jack. "Israeli Company Tests 'Suicide Drones' for Secret Foreign Buyers." *Europe*



- Newsweek*. June 8, 2015. Accessed on January 29, 2017, <http://europe.newsweek.com/israeli-company-tests-suicide-drones-secret-foreign-buyers-328396>.
- MyArmyBenefits.us.army.mil, Accessed January 2, 2017, [http://myarmybenefits.us.army.mil/Home/Benefit\\_Library/Federal\\_Benefits\\_Page/Death\\_Gratuity\\_.html](http://myarmybenefits.us.army.mil/Home/Benefit_Library/Federal_Benefits_Page/Death_Gratuity_.html)
- O'Neill, William. *A Democracy at War: America's Fight at Home and Abroad in World War II*. New York: The Free Press, 1993.
- Page, Lewis. "US War Robots in Iraq 'Turned Guns' on Fleshy Comrades." *The Register*. April 11, 2008. Accessed January 29, 2017, [http://www.theregister.co.uk/2008/04/11/us\\_war\\_robot\\_rebellion\\_iraq/](http://www.theregister.co.uk/2008/04/11/us_war_robot_rebellion_iraq/)
- Peers, Lieutenant General William R. *Report of the Department of the Army Review of the Preliminary Investigation into the My Lai Incident*. Washington DC, Department of the Army: 1970.
- Rosenberg, Matthew and John Markoff. "The Pentagon's 'Terminator Conundrum': Robots That Could Kill on their Own." *The New York Times*. October 25, 2016.
- Serbu, Jared. "Analysis: Pay, Benefits, O&M will Swallow Entire DoD Budget by 2024." *Federal News Radio*. April 8, 2013. Accessed January 1, 2017, <http://federalnewsradio.com/sequestration/2013/04/analysis-pay-benefits-om-will-swallow-entire-dod-budget-by-2024/>.
- Shane III, Leo and Patricia Kime. "New VA Study Finds 20 veterans Commit Suicide Each Day." *Military Times*, July 2016. Accessed December 31, 2016, <http://www.militarytimes.com/story/veterans/2016/07/07/va-suicide-20-daily-research/86788332/>.
- Sofge, Eric. "The Inside Story of the SWORDS Armed Robot 'Pullout' in Iraq: Update." *Popular Mechanics*. October 30, 2009. Accessed January 29, 2017, <http://www.popularmechanics.com/technology/gadgets/a2804/4258963/>.
- Strachan, Hew. *The First World War*. New York, NY: Penguin Books, 2003.
- Surkes, Sue. "Azerbaijan Said Using Israeli Drones Against Armenians." *The Times of Israel*. April 7 2016. Accessed January 29, 2017, <http://www.timesofisrael.com/azerbaijan-said-using-israeli-drones-against-armenians/>.
- Department of Veteran's Affairs. "PTSD: National Center for PTSD." Accessed January 1, 2017, <http://www.ptsd.va.gov/public/PTSD-overview/basics/how-common-is-ptsd.asp>.

Defense Manpower Data Center “DoD Personnel, Workforce Reports & Publications,” *DMDC*. Accessed April 2, 2017, [https://www.dmdc.osd.mil/appj/dwp/dwp\\_reports.jsp](https://www.dmdc.osd.mil/appj/dwp/dwp_reports.jsp).

Vonnegut, Kurt. *A Man Without a Country*. New York, NY, Seven Stories Press: 2005.

Whitlock, Craig. “Pentagon Asking Congress to Hold Back on Generous Increases in Troop Pay.” *Washington Post*, May 8, 2010. Accessed January 2, 2017, <http://www.washingtonpost.com/wpdyn/content/article/2010/05/07/AR2010050703188.html>.