Autonomous Weapons: Are You Sure These Are Killer Robots? Can We Talk About It?

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I. Introduction

On 6–7 February, the U.S. Military Academy's Center for the Rule of Law and the International Law Division of the Naval War College[1] co-sponsored a workshop on the legal implications of Autonomous Weapon Systems.[2] The stated goal of the workshop was to discuss the future of the Law of Armed Conflict regarding this emerging means of warfare. Fostering communication and building bonds between the various operational attorneys, international scholars, and human rights advocacy groups interested in the topic was a secondary, but no less important, objective of the event. As contemporary warfare becomes increasingly complex—whether due to the hybridization of conflicts,[3] the advent of new technologies,[4] or the fading distinction between combatants and civilians[5]—novel legal issues will continue to arise. Only through a continuing dialogue between scholars and practitioners on topics such as autonomous weapons will innovations in the law develop and address the unique challenges of modern warfare.[6]

II. Killer Robot or Roomba Vacuum?[7]

Autonomous weapons are those that, "once activated, can select and engage targets without further human operator involvement."[8] Though these weapons do not yet exist, a number of groups have recently campaigned[9] for an absolute prohibition on research, development, and deployment of this technology.[10] This coalition argues for a preemptive ban on autonomous weapons, believing the technology is immoral, violates "dictates of public conscience,"[11] and "may further the indiscriminate and disproportionate use of force" in warfare.[12] Holding these moral and legal arguments as unassailable truths, these anti-autonomous

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[1] The close affiliation between the U.S. Military Academy's Center for the Rule of Law and the Naval War College's International Law Division should in no way be construed as diminishing the importance of Beating Navy!

[2] A broader study on Autonomous Systems, led by the NATO Multinational Capability Development Campaign, is also ongoing. Along with the legal implications, the NATO study is researching the technological, operational, and ethical issues surrounding these new weapon systems. *See* North Atlantic Treaty Organization Allied Command Transformation, Vol. 3, *Innovation in Autonomous Systems: Policy, Technology, and Operations* (12 Dec. 2013) *available at* https://www.act.nato.int/volume-3-innovation-in-autonomous-systems-policy-technology-and-operations.

[3] *See* U.S. DEP'T OF DEF. QUADRENNIAL DEFENSE REVIEW REPORT 8 (Feb. 2010) [hereinafter QDR] ("The term 'hybrid' has recently been used to capture the seemingly increased complexity of war, the multiplicity of actors involved, and the blurring between traditional categories of conflict."); U.S. DEP'T OF ARMY, TRADOC PAM. 525-3-1, THE U.S. ARMY OPERATING CONCEPT 2016–2028, ¶ 2-2(a) (19 Aug. 2010) [hereinafter Army Operating Concept 2016–2028].

[4] *See, e.g.*, *U.S. Cyber Command: Organizing for Cyber Space Operations: Hearings Before the H. Comm. on Armed Services*, 111th Cong. 1 (2010) [hereinafter *Hearings*] (statement of Rep. Skelton, Chairman, H. Comm. on Armed Services) (discussing the various complications and risks being presented by cyber space).

[5] *See* INT'L COMM. OF THE RED CROSS, INTERPRETIVE GUIDANCE ON THE NOTION OF DIRECT PARTICIPATION IN HOSTILITIES UNDER INTERNATIONAL HUMANITARIAN LAW 7 (Nils Melzer ed., 2009) [hereinafter ICRC INTERPRETIVE GUIDANCE], http://www.icrc.org/eng/assets/files/other/icrc-002-0990.pdf (last visited Apr. 7, 2014) ("[T]here is little reason to believe that the current trend towards increased civilian participation in hostilities will weaken over time.").

[6] *See* Major Shane Reeves & Major Rob Barnsby, *The New Griffin of International Law: Hybrid Armed Conflicts*, HARV. INT'L REV., Winter 2012, at 16–18 (discussing the risks associated with the law of armed conflict remaining static).

[7] A roomba vacuum is an autonomous cleaning robot that removes dirt, dust, hair, and debris. *See* IROBOT ROOMBA VACUUM CLEANING ROBOT, http://www.irobot.com/us/learn/home/roomba.aspx (last visited Apr. 7, 2014). There have been no reported incidents of these autonomous robots attacking or killing any humans. However, in one incident, a roomba may have committed suicide. *See* Lee Moran, *Robot Suicide? Roomba Turns Itself on, Climbs onto Hotplate Where it Burns*, DAILY NEWS (Nov. 14, 2013, 9:56 AM), http://www.nydailynews.com/news/world/roomba-commits-suicide-hotplate-article-1.1516652.

[8] U.S. DEP'T OF DEF., DIR. 3000.09, AUTONOMY IN WEAPON SYSTEMS 13 (Nov. 2, 2012) [hereinafter DoD DIR. 3000.09], *available at* http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf.

[9] The most prominent group to oppose autonomous weapons is Human Rights Watch. *See generally* HUM. RHTS. WATCH, LOSING HUMANITY: THE CASE AGAINST KILLER ROBOTS (Nov. 2012), http://www.hrw.org/reports/2012/11/19/losing-humanity-0 [hereinafter LOSING HUMANITY].

[10] *See*, *e.g.*, CAMPAIGN TO STOP KILLER ROBOTS, http://www.stopkiller-robots.org/2014/01/infographicaoav/ (last visited Apr. 7, 2014) ("Fully autonomous weapons—or killer robots—are weapons that can, without human control, detect, select and engage targets. They do not yet exist, but the rapid developments in robotics and autonomous technology indicate that it is only a matter of time before fully autonomous weapons become an inhumane reality."); LOSING HUMANITY, *supra* note 9; Berlin Statement, International Committee for Robot Arms Control (Oct. 2010), http://icrac.net/statements/ [hereinafter Berlin Statement].

[11] *Q & A on Fully Autonomous Weapons*, HUM. RHTS. WATCH, Oct. 21, 2013, http://www.hrw.org/news/2013/10/21/qa-fully-autonomous-weapons.

[12] Berlin Statement, *supra* note 10.

weapon advocates are vehemently working to prevent any possible future with autonomous robot weapons.[13]

Yet the "truths" these groups espouse as justification for prohibiting the future development of autonomous weapons are certainly open to debate. It is exceedingly difficult to claim a moral imperative to ban autonomous weapons[14] when the technology is "simply too primitive . . . to comfortably draw conclusion[s]" as to the ethical consequences of their existence.[15] In actuality, moral ambiguity surrounds discussions concerning autonomous weapons.

For example, it is possible that the advanced technology of autonomous weapons may provide increased granularity in targeting. A preemptive ban is shortsighted as this may subvert the overarching intent of the Law of Armed Conflict to protect civilians.[16] In battlefields absent civilians, such as underwater or in space, autonomous weapons may reduce the suffering of combatants or even possibly eliminate the need for combatants.[17] Does it not make sense to explore the possibility of reducing combatant suffering and death? Perhaps continuing to rely on human judgment and emotion versus an objective and detached machine in the decision to use lethal force only increases the savagery of warfare.[18] Should autonomous weapons be so easily dismissed if they can possibly give greater clarity during the "fog of war" and reduce tragic or emotional mistakes? These questions, and a litany of others, need to be explored without prejudice. There is simply not enough known about autonomous weapons to morally condemn their development, as there are serious humanitarian risks to prohibition and a very real possibility this technology will be "ethically preferable to alternatives."[19]

Similarly, stating that autonomous weapons are categorically incapable of complying with the fundamental principles underlying the Law of Armed Conflict is clearly an overstatement.[20] Many believe that autonomous weapons may ultimately prove more capable of complying with the principle of distinction[21] than currently existing weaponry.[22] By extension, if autonomous weapons can decrease the risk to civilians and civilian objects, access to the technology can only help a commander comply with his obligations under the principle of proportionality.[23] Claims that autonomous

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[13] CAMPAIGN TO STOP KILLER ROBOTS, *supra* note 10 (statement of Professor Noel Sharkey, Chair of the International Committee for Robot Arms Control).

[14] *See* Angela Kane, *Killer Robots and the Rule of Law,* WORLD POST, Jul. 7, 2013, http://www.huffingtonpost.com/A-View-from-the-United-Nations-/killer-robots-and-the-rul_b_3599657.html (last visited Apr. 7, 2014) (Kane is the United Nations High Representative for Disarmament Affairs) ("We need not wait for a weapon system to emerge fully before appropriate action can be taken to understand its implications and mitigate and eliminate unacceptable risks.").

[15] Michael N. Schmitt, *Autonomous Weapon Systems and International Humanitarian Law: A Reply to the Critics*, HARV. NAT'L SEC. J. FEATURES 37 (2013), http://harvardnsj.org/wp-content/uploads/2013/02/Schmitt-Autonomous-Weapon-Systems-and-IHL-Final.pdf ("[U]nderstanding of the systems' potential for both positive and negative ends is simply too primitive at this time to comfortably draw conclusions as to their legal, moral, and operational costs and benefits.").

[16] Protecting civilians is one of the primary goals of the law of armed conflict. *See* ICRC INTERPRETIVE GUIDANCE, *supra* note 5, at 4. Eliminating an autonomous weapon for humanitarian purposes, despite the possibility that the technology may help a commander adhere to his obligations under the law of armed conflict with greater precision, will contravene the very reason for the initial prohibition. *See* Shane R. Reeves & Jeffrey S. Thurnher, *Are We Reaching a Tipping Point? How Contemporary Challenges Are Affecting the Military Necessity-Humanity Balance*, HARV. NAT'L SEC. J. FEATURES 6–9 (2013).

[17] *See* Jeffrey S. Thurnher, *The Law That Applies to Autonomous Weapon Systems*, 17(4) ASIL INSIGHTS (Jan. 18, 2013), http://www.asil.org/insights/volume/17/issue/4/law-applies-autonomous-weapon-systems ("There may be situations in which an autonomous weapon system could satisfy this rule with a considerably low level ability to distinguish between civilian and military targets. Examples would include during high intensity conflicts against declared hostile forces or in battles that occur in remote regions, such as underwater, deserts, or areas like the Demilitarized Zone in Korea.").

[18] Schmitt, *supra* note 15, at 12–13 (arguing that "[i]n fact, human judgment can prove less reliable than technical indicators in the heat of battle").

[19] Kenneth Anderson & Matthew C. Waxman, *Law and Ethics for Autonomous Weapon Systems: Why a Ban Won't Work and How the Laws of War Can*, 1, 21 (2013) (Stanford University, The Hoover Institution (Jean Perkins Task Force on National Security and Law Essay Series)), *available at* http://ssrn.com/abstract=2250126 ("If all such systems are prohibited, and particularly if even research and development of relevant technologies is also prohibited, one never gets the benefits that might come from new technologies and future generations will not even be aware of the potential benefits that were given up . . . .").

[20] LOSING HUMANITY, *supra* note 9, at 37–42 (asserting that fully autonomous weapons will be unable to comply with fundamental principles of the Law of Armed Conflict).

[21] Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflict (Protocol I) art. 48, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter AP I] ("[The principle of distinction], [i]n order to ensure respect for and protection of the civilian population and objects, [requires] the Parties to the conflict [to] at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly . . . direct their operations only against military objectives."). Distinction is the most significant of the fundamental principles of the law of armed conflict as "[i]t is the foundation on which the codification of the laws and customs of war rests." INT'L COMM. OF THE RED CROSS, COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, at 598 (Yves Sandoz et al. eds., 1987).

[22] *See* Anderson & Waxman, *supra* note 19, at 12.

[23] The proportionality principle holds that an attack "which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof which would be excessive in relation to the concrete and direct military advantage anticipated" is indiscriminate and a law of armed conflict violation. AP I, *supra* note 21, art. 51(5)(b); Art. 57(2)(b); *see also* U.S. DEP'T OF ARMY, FIELD MANUAL 27-10, THE LAW OF LAND WARFARE para. 41 (18 July 1956) (C1, 15 July 1976). For a discussion on what defines "excessive," see Shane R. Reeves & David Lai, *A Broad Overview of the Law of Armed Conflict in the Age of Terror*, *in* THE FUNDAMENTALS OF COUNTERTERRORISM LAW 21–22 (Lynne Zusman ed., 2014).

weapons cannot comply with the principle of military necessity demonstrate a lack of understanding concerning the concept.[24] It is unhelpful to view military necessity as a distinct principle, as the most prominent anti-autonomous weapon advocates do,[25] but rather as a "meta-principle" that has general applicability permeating the entirety of the Law of Armed Conflict, which is continually addressed in subsidiary positive law.[26] However, even under a "stand alone" analysis of military necessity, autonomous weapons "would not be unlawful *per se* because it is clear that autonomous weapon systems may be used in situations in which they are valuable militarily—that is, militarily necessary."[27] By generally asserting that autonomous weapons are incapable of abiding by the Law of Armed Conflict,[28] opponents "melodramatically oversimplify" this important body of law while failing to recognize its strengths.[29]

These efforts to stop "killer robots" are misguided. Autonomous weapons are a near-term reality, and it is naïve to believe that the technology will regress.[30] It is unrealistic to suspend all autonomous weapons testing and development until a legal and regulatory framework is created, as some have suggested, because the technological advances require a contemporaneous dialogue on the topic.[31] The issues presented by autonomous weapons already exist; instead of focusing on how best to obstruct this new means of warfare, emphasis should be placed on creating a partnership between scholars and practitioners to best determine the way forward on regulating autonomous weapons.[32]

III. Learning from History

The importance of the form and function of the discussion on autonomous weapons cannot be overstated. Simply posing the view that autonomous weapons are inherently wrong and should not be developed will cause significant harm to the international community. How this harm may result is best illustrated through a historical analysis of the attempt to ban aerial bombardment[33] and the failure of those policies to prevent the unprecedented mass civilian casualties of World War II. This historical analysis, and particularly the failure of the anti-aerial bombardment advocates, is therefore instructive in the autonomous weapons context as contemporary activists echo the same arguments today.[34]

Prior to 1899, the warring world had seen a few significant technological advancements that threatened to overthrow the status quo for civilized warfare. Notably, the crossbow, and its ability to penetrate a noble's armor while being fired by an unskilled conscript, was seen as an unequivocal violation of chivalric code.[35] Pope Innocent II attempted to outlaw its use.[36] Not surprisingly, the range, accuracy, and lack of skill required for its use made the weapon too appealing for principalities to not use. The crossbow became the mainstay of feudal armies.[37] Similar to the crossbow, the preordained failure of the total ban-on-use approach was again demonstrated with aerial bombardment beginning in the late 18th Century.

The hot air balloon took its inaugural flight in 1783 with two innovative brothers, Joseph and Etienne Montgolfier, at

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[24] LOSING HUMANITY, *supra* note 9, at 30 (arguing that robots would be unable to follow the rules of military necessity).

[25] *Id.*

[26] *See* Brian J. Bill, *The Rendulic "Rule": Military Necessity, Commander's Knowledge, and Methods of Warfare*, *in* 12 Y.B. INT'L HUMANITARIAN L. 119, 131 (2009) ("Military necessity is a meta-principle of the law of war . . . in the sense that it justifies destruction in war. It permeates all subsidiary rules."); Michael N. Schmitt, *Military Necessity and Humanity in International Humanitarian Law: Preserving the Delicate Balance*, 50 VA. J. INT'L L. 795, 795–839 (2010); YORAM DINSTEIN, THE CONDUCT OF HOSTILITIES UNDER THE LAW OF INTERNATIONAL ARMED CONFLICT 16 (2004) ("Law of International Armed Conflict in its entirety is predicated on a subtle equilibrium between two diametrically opposed impulses: military necessity and humanitarian considerations.").

[27] Schmitt, *supra* note 15, at 22.

[28] LOSING HUMANITY, *supra* note 9, at 30.

[29] *Id.* at 8.

[30] Cadet Allyson Hauptman, *Autonomous Weapons and the Laws of Armed Conflict*, 1 MIL. L. REV. 170 (Winter 2013).

[31] In April 2013, a United Nations Special Rapporteur issued a report to the UN Human Rights Council recommending a suspension of all AWS testing and development until nations can agree on a legal and regulatory framework for their use. Report of the Special Rapporteur on Extrajudicial Summary or Arbitrary Executions, U.N. Doc. A/HRC/23/47 (Apr. 9, 2013) (by Christof Heyns), *available at* http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-47_en.pdf. It is unclear whether this report includes a prohibition on research. However, it is reasonable to assume that the broad prohibition on development, production, and use of autonomous weapons advocated for by many would also include research. *See, e.g.*, LOSING HUMANITY, *supra* note 9, at 5.

[32] Hauptman, *supra* note 30, at 1.

[33] *See generally* RULES CONCERNING THE CONTROL OF WIRELESS TELEGRAPHY IN TIME OF WAR AND AIR WARFARE, DRAFTED BY A COMMISSION OF JURISTS AT THE HAGUE, DEC. 1922–FEB. 1923, *available at* http://www.icrc.org/applic/ihl/ihl.nsf/Treaty.xsp?documentId=B9CA3866276E91CFC12563CD002D691C&action=openDocument (last visited Apr. 7, 2014). The draft Part II of the unsigned convention proposed specific rules for the use of aerial bombardment, but the draft never produced a binding agreement. *Id.*

[34] CAMPAIGN TO STOP KILLER ROBOTS, *supra* note 10, at 1.

[35] Paul A. Robblee, Jr., *The Legitimacy of Modern Weaponry: A Thesis Presented to the Judge Advocate General's School, United States Army* 6 (1975) (citing C. FENWICK, INTERNATIONAL LAW 667 (4th ed. 1965)); J. SPAIGHT, WAR CRIMES ON LAND 76 (1911). Pope Innocent II attempted to prohibit the use of the crossbow in 1139 at the second Lateran Council.

[36] Robblee, *supra* note 35, at 6.

[37] *Id.*

the helm.[38] It did not take long for the balloon to assume military use. By the Franco-Prussian War, the balloon was a useful military reconnaissance vehicle.[39] It was only a matter of time until military strategists envisioned the balloon as not only a means to reconnaissance, but also as a means to attack the enemy from an undisputed position of advantage. Many feared that aerial bombing from great heights would cause too much collateral damage.[40] This fear was addressed during the Hague Conferences of 1899. The current conversation on autonomous weapons mirrors that which occurred for aerial bombardment during the Hague Conference and is memorialized in Declaration IV, 1 of the 1899 Hague Convention.[41]

Declaration IV, 1 prohibited the use of balloons to launch projectiles. Twenty-four countries became States party to the declaration.[42] These were significant states as well, with France, Austria-Hungary, and Germany ratifying the declaration.[43] The balloon in 1899 is not unlike the autonomous weapon in 2014. Military applications are clear, but the full potential of this new weapon system remains limited by the imagination and the ever-advancing threshold of technological innovation. If the balloon and the autonomous weapon system are analogous, then the anti-autonomous weapon system group should be on the cusp of an international agreement prohibiting its use. Any such belief is wholly misplaced. In fact, the subsequent history of aerial bombardment demonstrates that a prohibitive agreement is at best useless, if not damaging to the advancement of the law.

The 1899 prohibition on aerial bombardment contained a self-limiting provision—it expired after five years.[44] This is not surprising. The concept of aerial bombardment as a feasible form of attack remained in its infancy, but the risks were clearly articulable.[45] States were reluctant to sign away their ability to employ a valuable weapon system that could hold great military advantage in the future. They were also reluctant to give up its use immediately unless potential adversaries also made the same concession.[46] In 1907, the anti-aerial bombardment regime sought to renew their 1899 victory and succeeded in doing so with Declaration XIV in 1907.[47] This second meeting and renewal of the 1899 Declaration was met with greater resistance and apprehension than the previous declaration, and its titling became narrower.[48] International apprehension regarding an all-out ban on aerial bombardment was brought on by the triumph of another pair of brothers—Orville and Wilbur Wright. In December, 1903, the Wright Brothers made the airplane a reality.[49] The clumsy balloon with its dubious strategic implications moved aside to make room for a true revolution in military affairs, the capability to deliver an explosive payload to a pre-designated target in distant lands.[50]

The airplane did not make aerial bombardment less problematic under the law of armed conflict. In 1907, a bomb dropped from an airplane was no more likely to be accurate than a bomb dropped from a balloon. In fact, the bomb dropped from the balloon was probably more accurate if dropped from a stationary balloon at lower altitudes. However, the strategic importance of the method of attack took on a whole new meaning.[51] States realized that not

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[38] Javier Guisández Gomez, *The Law of Air Warfare*, 323 ICRC INT'L REV. 195, 347 (1998).

[39] *Id.*

[40] *Id.*

[41] Declaration (IV, 1), to Prohibit, for the term of Five Years, the Launching of Projectiles and Explosives from Balloons and Other Methods of Similar Nature, The Hague 29 July 1899, 32 Stat. 1839 [hereinafter Balloon Declaration of 1899].

[42] *Id.* The following states ratified the declaration: Austria-Hungary, Belgium, Bulgaria, China, Denmark, France, Germany, Greece, Iran, Italy, Japan, Luxembourg, Mexico, Montenegro, Netherlands, Norway, Portugal, Romania, Russia, Serbia, Spain, Sweden, Switzerland, and Thailand. Turkey and the United States both signed, but did not ratify, the declaration.

[43] *Id.*

[44] *Id.*

[45] Gomez, *supra* note 38, at note 5. Many factors affected the accuracy of a bomb dropped from a balloon. The bomb was aimed simply by visual orientation. Weather, to include air temperature and winds could greatly affect accuracy. Cloud cover and ground fog directly impacted the ability to positively identify intended targets. *Id.*

[46] Balloon Declaration of 1899, *supra* note 41. "The present Declaration is only binding on the Contracting Powers in case of war between two or more of them. It shall cease to be binding from the time when, in a war between the Contracting Powers, one of the belligerents is joined by a non-Contracting Power." *Id.*

[47] Declaration (XIV) Prohibiting the Discharge of Projectiles and Explosives from Balloons, The Hague, 18 October 1907, 36 Stat. 2439 [hereinafter Balloon Declaration of 1907].

[48] *Id.* The number of signatories dropped from twenty-six (twenty-four ratifying) in 1899 to a mere fifteen signatories in 1907. Although by 1973, the declaration had twenty signatories, the notable key missing parties were Germany and Austria. The full title of the Balloon Declaration of 1899 contained a clause prohibiting "other new methods of a similar nature," while the 1907 Balloon Declaration removed that clause from the title. However, the declarations contained identical language in describing the prohibition: "The Contracting Powers agree to prohibit, for a term of five years [for a period extending to the close of the Third Peace Conference], the launching of projectiles and explosives from balloons, or by other new methods of similar nature." *Id.*

[49] Gomez, *supra* note 38.

[50] Matthew Lippman, *Aerial Attacks on Civilians and the Humanitarian Law of War Technology and Terror from World War I to Afghanistan*, 33 CAL. W. INT'L L.J. 1, 8–11 (2002). *See generally* Arthur K. Kuhn, *Beginnings of an Aerial Law*, 4 AM. J. INT'L L. 109, 118 (1910).

[51] A hot air balloon is essentially limited to travel based upon wind and weather. The balloon pilot has only limited control over the final destination. An airplane has speed and navigation capabilities that make it a clear tool to project combat power.

having the capability to fight from the air would put them at a distinct disadvantage.[52]

The concerns of states and the positions of interested parties concerning balloons are eerily like the current conversation on autonomous weapons.[53] Human rights advocates want to place an absolute prohibition on autonomous weapons[54] and are seemingly gaining ground with at least a few states to create a multilateral agreement.[55] Like aerial bombardment at the turn of the twentieth century, autonomous weapons remain masked in myth and science fiction, making any such agreement for naught.

By the onset of World War II, the strategic applications of aerial bombardment came to fruition and their deadly nature continued to rapidly evolve through the war.[56] The international community knew that the potential for massive civilian casualties through the use of aerial bombardment was an undeniable reality.[57] However, attempts to regulate it away failed unequivocally.[58] The tactical and strategic advantages of aerial bombardment caused the power brokers of world politics to push back from the bargaining table to prepare their air fleets for war.[59] The civilian casualties in that war would be unprecedented.[60]

The failed attempts to regulate away bombs from the sky are a tragic and sad tale. The tragedy is all the more disheartening because it was avoidable, had the conversation focused not on prohibiting aerial bombardment, but rather on improving the technology of bombardment to prevent civilian casualties and bringing aerial bombardment into compliance with existing laws of armed conflict. Within a matter of decades following World War II, the technology of air warfare made it possible to distinguish within meters of a target and a civilian object.[61] By the Kosovo air war in 1999 (only 50 years after the end of World War II), normal citizens could watch a bomb hitting a moving truck from the comfort of their living rooms.[62] The technology for smart bombs was born out of the political sensitivity associated with the United States' attacks against Saddam Hussein's infrastructure inside the crowded city of Baghdad.[63] However, the efficacy of smart bombs in a conventional, total war should not be disputed.[64] Indeed, aerial bombardment has come a long way since the balloon. Unfortunately, that progress resulted in the loss of hundreds of thousands of innocent lives.

The prohibitive regime against aerial bombardment at the turn of the twentieth century likely contributed to the mass civilian casualties of World War II. The unrealistic and misguided attempt to ban aerial bombardment retarded the development of the more discriminative technology that

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[52] Lippman, *supra* note 50, at 8–11.

[53] *See supra* note 31.

[54] *Id.*

[55] *See* Brid-Aine Parnell, *Killer Robots Could Be Banned by the UN Before 2016*, FORBES, Nov. 18, 2013, *available at* http://www.forbes.com/sites/bridaineparnell/2013/11/18/killer-robots-could-be-banned-by-the-un-before-2016/2/. Ms. Parnell does not specifically cite to states that are interested in signing amendments to the Conventional Weapons Treaty governing autonomous weapons systems. However, the United Nations Human Rights Committee is interested in pursuing the topic, which increases the likelihood of a possible international agreement. The number of country signatories does not necessarily indicate the efficacy of a particular treaty. If the majority of signatories are states with little interest in the development of autonomous weapons, or are states with little capacity to contribute to the technology, then such a treaty is of little value in the development of an enforceable international legal regime. *See* John B. Bellinger, III & William J. Haynes II, *A U.S. Government Response to the International Committee of the Red Cross Study Customary International Humanitarian Law*, 89 INT'L REV. OF THE RED CROSS, no. 866, at 443, 445–46 (2007) (Reports and Documents).

[56] Lippman, *supra* note 50, at 15–20.

[57] *See* Appeal of President Franklin D. Roosevelt on Aerial Bombardment of Civilian Populations (Sept. 1, 1939), *available at* http://www.dannen.com/decision/int-law.html#E (last visited Apr. 7, 2014) ("If resort is had to this form of inhuman barbarism during the period of the tragic conflagration with which the world is now confronted, hundreds of thousands of innocent human beings who have no responsibility for, and who are not even remotely participating in, the hostilities which have now broken out, will lose their lives.").

[58] Aerial bombing against area targets culminated in World War II with the nuclear bomb attacks against Hiroshima and Nagasaki, but the use of unguided aerial bombing continued through to the Vietnam War. BARRETT TILLMAN, WHIRLWIND: THE AIR WAR AGAINST JAPAN, 1942–1945, at 231–45. Lippman, *supra* note 50, at 31–35.

[59] WILLIAM H. BOOTHBY, THE LAW OF TARGETING 22–25 (2012).

[60] STEPHEN A. GARRETT, ETHICS AND AIRPOWER IN WORLD WAR II 1-22 (1993).

[61] Richard P. Hallion, *Precision Guided Munitions and the New Era of Warfare* 3 (Air Power Studies Ctr., Working Paper No. 53, 1995), *available at* https://www.fas.org/man/dod-101/sys/smart/docs/paper53.htm (last visited Apr. 7, 2014).

[62] Commanders and human rights organizations could also review strikes for compliance with the law of armed conflict. The development of precision in aerial munitions took giant leaps forward following World War II. For instance, the accuracy (or circular error probable (CEP)) for aerial bombardment was 3.3 times better in the Korean War than it was in World War II. By the Vietnam War, the CEP was reduced to less than 1/8th of what it had been in World War II. *Id.*

[63] Hallion, *supra* note 61, at 3.

[64] [Precision Guided Munitions] provide density, mass per unit volume, which is a more efficient measurement of force. In short, targets are no longer massive, and neither are the aerial weapons used to neutralize them. One could argue that all targets are precision targets—even individual tanks, artillery pieces, or infantrymen. There is no logical reason why bullets or bombs should be wasted on empty air or dirt. Ideally, every shot fired should find its mark.

PHILIP S. MEILINGER, 10 PROPOSITIONS ABOUT AIR POWER 45 (1995), *available at* http://www.afhso.af.mil/shared/media/document/AFD-100525-026.pdf.

appeared shortly after the war.[65] Had the conversation been focused upon accepting the new technology as a means of warfare, and making that means more discriminating, the conversation could have pushed the technology into greater compliance with international norms. The prohibitive regime bullying itself to outlaw autonomous weapons is making the same mistake its predecessors made a century ago. Autonomous weapons will be a reality, and if their use means winning the war, they will be used. But they can be made better. The technology needs to be pushed in front of the necessity before valuable time and a purposed direction are lost.

IV. Scholars and Practitioners Unite!

Collaboration between scholars and practitioners is the most likely way to develop creative, yet pragmatic, answers to the difficult questions created by autonomous weapons. Each of these groups has a particular strength. Scholars are more likely to think beyond what the Law of Armed Conflict is in practice, or *lex lata*, and focus on *lex ferenda*, or what the law should become.[66] Practitioners inject experience, realism, and operational acumen,[67] ensuring that any solution developed is workable. In isolation, these strengths can at times become weaknesses, with scholars floundering in theory and practitioners myopically focused on current operations. But together, scholars and practitioners have the opportunity to amalgamate theory and experience into a solution that is supported by all.

Of course these are only stereotypes, with many scholars having an operational background and many practitioners being accomplished academics. Regardless of who brings what perspective to the discussion, the need for innovation couched in realism requires the traditional virtues of both the "ivory tower" and "the field." Academics and operational attorneys must make an effort to bridge the divide between their two distinct cultures. The interaction created will result in relationships and eventually, effective solutions to difficult problems. Undoubtedly, creating a framework to regulate autonomous weapons will require collaborative effort between scholars and practitioners.

The need for collaboration between scholars and practitioners, however, goes beyond simply discussing autonomous weapons. Uncertainty in warfare is becoming commonplace, with ambiguity in armed conflict becoming the norm rather than the exception.[68] As the "pace of change continues to accelerate,"[69] the complexities of the modern battlefield risk overwhelming the understandings that have traditionally regulated warfare. "Increasingly, the treaties and customary laws of the past century that comprise the Law of Armed Conflict, while recognized as extremely meaningful, have proven incapable of satisfactorily resolving the myriad of legal issues arising from modern warfare."[70] The international community cannot afford to allow the Law of Armed Conflict to become an anachronism incapable of addressing the challenges of contemporary conflicts.[71] Ensuring the law does not slip into irrelevance requires a proactive and broad approach to problem-solving. Partnerships—like those being developed between scholars and practitioners to find answers to the difficulties arising from autonomous weapons—are perhaps the best hope of ensuring that the primacy of the Law of Armed Conflict remains unquestioned.

V. Conclusion

The rise of autonomous weapons understandably creates concern for the international community, as it is impossible to predict exactly what will happen with the technology. Yet the emergence of a new means of warfare is not a unique phenomenon and is assumed within the Law of Armed Conflict.[72] The international community has seen the cost of

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[65] The prohibitive regime likely worked to encourage states to assume the view that aerial bombardment fell under a different legal regime than other methods of attack. The derivative argument is as follows: If the existing law of armed conflict regime for land warfare applied to aerial bombardment, then activists would likely not need to seek a prohibitive international agreement; therefore, states are free to assume that the existing customary international law principles for land warfare do not apply in an aerial campaign. *See also* Lippman, *supra* note 50, at 15–20. It was not until the Additional Protocols to the Geneva Conventions of 1949 that states truly recognized that the fundamental principles of the law of land warfare apply equally to aerial bombardment.

[66] *Lex Lata* is defined as "what the law is." *See* Major J. Jeremy Marsh, *Lex Lata or Lex Ferenda? Rule 45 of the ICRC Study on Customary International Humanitarian Law*, 198 MIL. L. REV. 116, 117 (2008). *Lex Ferenda* is defined as "what the law should be." *Id.*

[67] For example, an operational law attorney's understanding of the collateral damage estimate methodology (CDEM) would inform any discussion on autonomous weapons and proportionality. *See, e.g.*, Schmitt, *supra* note 15, at 19–20.

[68] *See* ARMY OPERATING CONCEPT 2016–2028, *supra* note 3, ¶ 2-2(a); QDR, *supra* note 3, at iii.

[69] QDR, *supra* note 3, at iii.

[70] Reeves & Barnsby, *supra* note 6, at 17.

[71] *Id.* (discussing the ramifications if the Law of Armed Conflict becomes inconsequential due to stasis).

[72] AP I, *supra* note 21, art. 36. Article 36 requires that "in study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party." *Id.* Though the United States has not ratified AP I, it classifies many portions of the protocol as customary international law. *See generally* Michael J. Matheson, *Remarks on the U.S. Position on the Relation of Customary International Law to the 1977 Protocols Additional to the 1949 Geneva Conventions*, 2 AM. U.J. INT'L L. & POL'Y 419 (1987). Article 36 is considered customary international law and therefore obligatory for all state actors. *See* Schmitt, *supra* note 15, at 28. For a more detailed discussion on Article 36, see Michael N. Schmitt & Jeffrey S. Thurnher, *"Out of the Loop": Autonomous Weapon Systems and the Law of Armed Conflict*, 4 HARV. NAT'L SEC. J. 231, 271 (2013).

prohibitive regimes that deny the reality of necessity in the development of aerial bombardment. Further, those exploring the idea of autonomous weapons are sensitive not only to their legal obligations, but also to the various ethical and moral questions surrounding the technology.[73] Joining the drive for technology with the drive for humanity can only improve both, while a divergence of the two could cause a repetition of past calamities. Rather than attempting to preemptively ban autonomous weapons before understanding the technology's potential, efforts should be made to pool the collective intellectual resources of scholars and practitioners to develop a road forward. Perhaps this would be the first step to a more comprehensive and assertive approach to addressing the other pressing issues of modern warfare.

[73] *See* Reeves & Thurnher, *supra* note 16, at 9 ("[S]tates recognize the unique legal implications associated with autonomous weapons and are implementing the measures they deem appropriate to manage this emerging technology. States are entitled to the time and flexibility necessary to fully examine these issues and establish responsible norms.").