

Book Reviews

Wired for War: The Robotics Revolution and Conflict in the Twenty-First Century¹

Reviewed by Major Michael P. Baileys²

*Man's monopoly of warfare is being
broken. We are entering the era of robots
at war.*³

I. Introduction

In *Wired for War*, P.W. Singer demonstrates that twenty-first century robots have left Deep Blue (“IBM’s chess-playing supercomputer”)⁴ in the dust, and that humankind needs to pay attention, lest it suffer the same fate.⁵ Bolstered by four years of research and investigation,⁶ Singer explores everything from the history of robotics⁷ to the plausibility of a “robot revolt.”⁸ The result is a provocative gem that challenges readers from all walks-of-life to consider the consequences of creating robots with “artificial intelligence,”⁹ arming them with extremely accurate weapons systems,¹⁰ and deploying them into battle.¹¹ This review examines Singer’s primary arguments, the potential impact of these developments on military commanders, and the challenges the operational legal community will face because of these technological innovations.

II. Robots Will Change Everything We Know About War¹²

Singer argues that robots that participate in war are not only the “most important weapons development since the atomic bomb,”¹³ but also that society may be in the midst of a “[robotic] revolution in warfare and technology that will literally transform human history”¹⁴ In *Wired for War*, he contemplates future battlefields where robotic warriors¹⁵ order shape-shifting¹⁶ Howitzers to fire on enemy androids protected by a rocket-wielding droid with the appearance of R2-D2 in the acclaimed *Star Wars* series.¹⁷ Through such far-fetched scenarios, Singer compels readers to consider the possibility that human Soldiers may eventually surrender their role in war to sentient robots, capable of thinking, acting, and killing on their own.¹⁸

Singer distinguishes autonomous robots’ participation in war from the development of other historical weapons by emphasizing a simple fact: robots have the capability to remove humans altogether from particular segments of the battlefield.¹⁹ Before fully autonomous robots like the “Polecat,”²⁰ a machine that “will be able to carry out its mission from takeoff to landing without any human instruction,”²¹ or the proposed “Vulture,”²² which experts hope will remain aloft for five years, man has controlled the human or robot entities that fight.²³ Although scientists and

¹ P.W. SINGER, *WIRED FOR WAR: THE ROBOTICS REVOLUTION AND CONFLICT IN THE TWENTY-FIRST CENTURY* (2009).

² Judge Advocate, U.S. Army. Student, 58th Judge Advocate Officer Graduate Course, The Judge Advocate Gen.’s Legal Ctr. & Sch., U.S. Army, Charlottesville, Va.

³ SINGER, *supra* note 1, at 41.

⁴ *Id.* at 45.

⁵ *Id.* at 41.

⁶ *Id.* at 12 (detailing the various sources used: history books, military and technology journals, Internet sites, as well as interviews of various scientific, military, government, and media experts).

⁷ *Id.* at 42.

⁸ *Id.* at 413.

⁹ *Id.* at 77; Interview by P.W. Singer with Sebastian Thrun, Dir. of the Artificial Intelligence Lab., Stanford Univ. (Mar. 18, 2007) (“[A]rtificial intelligence is the ‘the ability of a machine to perceive something complex and make appropriate decisions.’”).

¹⁰ SINGER, *supra* note 1, at 31.

¹¹ *Id.* at 37.

¹² *Id.* at 41.

¹³ *Id.* at 10.

¹⁴ *Id.* at 11.

¹⁵ *Id.* at 89 (describing the advances in “humanoid” robotics, where the robots have two arms and legs).

¹⁶ *See id.* at 93 (“[S]cientists in Palo Alto have already made the Polybot, which uses hinged cubes to shape its entire body into all sorts of forms, such as shifting from a snake into a spider.”).

¹⁷ *Id.* at 38 (“[T]he Counter Rocket Artillery Mortar technology, or CRAM for short . . . is basically R2-D2 taken off of a ship and crammed (mounted) onto a flatbed truck.”).

¹⁸ *Id.* at 120 (“Drone versus drone may be the next step in warfare.”).

¹⁹ *Id.* at 117.

²⁰ *Id.*

²¹ *Id.*

²² *Id.* (defining the “VULTURE” as a “Very-high-altitude, Ultra-endurance, Loitering Theater Unmanned Reconnaissance Element drone.”).

²³ *Id.* at 41.

military experts vehemently affirm that humans will always be “in the loop,”²⁴ Singer suggests future robots may not only assume the nation’s toughest military missions, but they may also execute fully autonomous operations.²⁵

III. People Win and Lose Wars . . . Especially Counterinsurgencies

Few would argue against the tactical utility of a robot that can “. . . run four-minute miles for five hours, carrying one hundred pounds of gear,”²⁶ or a reconnaissance drone that may remain aloft for up to five years.²⁷ Even fewer would object to hunting down our country’s most wanted terrorists with drones that never have to sleep, eat, or refuel. Nevertheless, military and political leaders should ask whether these twenty-first century creations are helping us win our current conflicts?

Commanders and legislators alike are clamoring for additional unmanned systems to employ on various tactical (reconnaissance, explosive ordinance disposal, targeting, and intelligence gathering) missions.²⁸ However, neither the scientific community nor the deep thinkers at the Defense Advanced Research Projects Agency (DARPA)²⁹ have developed robots who can master the human subtleties required for Counterinsurgency (COIN) operations. Robots cannot sit down and have tea with a local sheik,³⁰ or listen to the grievances of a local governing council with the requisite mix of shrewdness and empathy required to marshal allies in a COIN environment.³¹ The conflicts in Iraq and Afghanistan require commanders to show tremendous care and tact while prosecuting the war effort. Thus, commanders should endeavor to use robots, drones, and unmanned aerial vehicles (UAVs) with great caution, lest

our enemies turn our technological strength into an operational weakness.

Tactically, unmanned systems yield impressive results, such as the exploits of the Sky Warrior, which helped Task Force Odin kill more than 2400 insurgents in one year.³² However, they are not perfect and, at times, fatally inaccurate.³³ Collateral damage fuels insurgent recruitment,³⁴ which poses challenges for commanders fighting for the confidence of the local populace.³⁵ One expert on Middle Eastern affairs told Singer, “[t]he average person sees it [use of unmanned systems] as just another sign of the coldhearted, cruel Israelis and Americans, who are cowards because they send out machines to fight us.”³⁶ Another Pakistani Army officer noted “One cannot deny the effect of the drones in taking out senior leadership, the militancy’s centre of gravity . . . [b]ut at the same time it has become a huge motivation to fight against the Government and the army . . . [a]ll combined, it creates a very negative impact.”³⁷ Accordingly, commanders must reflect on these observations while weighing the risks of utilizing machines in COIN campaigns. While overreliance on unmanned systems could lose the “hearts and minds”³⁸ of the local people, avoiding the use of these same systems could put more U.S. troops at risk.

The U.S. aversion to losing troops (and the military’s attempts to mitigate that risk) has created a vulnerability³⁹ that the proliferation of unmanned systems may exacerbate.⁴⁰ One scholar sees inherent dangers in the

²⁴ *Id.* at 123.

²⁵ *See id.* at 126.

²⁶ *Id.* at 24.

²⁷ *Id.* at 117

²⁸ *Id.* at 65, 216.

²⁹ *Id.* at 140 (“DARPA’s overall mission is to support fundamental research on technologies that might be common twenty years from now, and to try to make them happen earlier to serve the needs of the U.S. military today.”).

³⁰ *Id.* at 76 (highlighting the current reality that robots have difficulty with certain simple human tasks, like distinguishing an apple from a tomato).

³¹ U.S. DEP’T OF ARMY, FIELD MANUAL 3-24, COUNTERINSURGENCY para. 7-8 (15 Dec. 2006) [hereinafter FM 3-24] (“Another part of analyzing a COIN mission involves assuming responsibility for everyone in the AO. This means that leaders feel the pulse of the local populace, understand their motivations, and care about what they want and need. Genuine compassion and empathy for the populace provide an effective weapon against insurgents.”).

³² SINGER, *supra* note 1, at 222 (“Task Force Odin (the chief Norse god, but also short for “Observe-Detect-Identify-Neutralize) . . . was able to find and kill more than 2400 insurgents either making or planting bombs, as well as capture 141 more, all in just one year.”).

³³ *Id.* at 125, 397 (citing examples where innocent civilians died because of drone errors).

³⁴ FM 3-24, *supra* note 31, para. 1-141] (“An operation that kills five insurgents is counterproductive if collateral damage leads to the recruitment of fifty more insurgents.”).

³⁵ *See id.* para. 1-142 (“In a COIN environment, it is vital for commanders to adopt appropriate and measured levels of force and apply that force precisely so that it accomplishes the mission without causing unnecessary loss of life or suffering.”).

³⁶ SINGER, *supra* note 1, at 309; Interview by P.W. Singer with Rami Khouri, Dir. of the Issam Fares Inst. of Pub. Policy and Int’l Affairs, Am. Univ. of Beirut (Aug. 26, 2006).

³⁷ Anthony Loyd, *US Drone Strikes in Pakistan Tribal Areas Boost Support for Taleban*, LONDON TIMES, Mar. 10, 2010.

³⁸ FM 3-24, *supra* note 31, app. A, para. A-26.

³⁹ SINGER, *supra* note 1, at 59; Major General (Ret.) Robert H. Scales, *Urban Warfare: A Soldier’s View*, MIL. REV., Jan.–Feb. 2005, at 9 (“[D]ead soldiers are America’s most vulnerable center of gravity. . . .”).

⁴⁰ SINGER, *supra* note 1, at 60.

overreliance on technology to produce “riskless wars.”⁴¹ Comparing present robotic advances and past technologies, Dr. Douglas Peifer warns, “betting that the latest iteration of revolutionary technology will magically compel a resolute enemy to come to terms is unwise [because] [t]hinking opponents have a way of unmasking magic and bedeviling the best laid plans for riskless war.”⁴² Commanders should heed this warning by considering the limitations of our space-age arsenal while engaged in a war against enemies who consistently exploit the technological advances of their opponents to gain an upper-hand on the battlefield.

There is no blueprint for commanders to consult when trying to balance COIN principles with the proliferation of unmanned systems.⁴³ However, no matter how accurate a robot can fire or how fast it can “run,” commanders ultimately decide which systems to use against a given enemy. The balance commanders establish will set the stage for success in a COIN environment. Judicious use of unmanned systems may limit the enemy’s ability to propagandize technical mishaps causing collateral damage. Alternatively, the less a commander employs unmanned systems, the more risk Soldiers assume while performing dangerous duties. Singer envisions “a combination of the age-old methods with the new technology . . . in these complex fights.”⁴⁴ Regardless of the implementation plan, the decision remains in human hands, and with that power a commander can manage the impact unmanned systems have in war.

IV. Lawyers Beware

As the military fields more and more unmanned systems, uniformed attorneys will find it increasingly difficult to reign in the use of these new weapons without a workable legal framework. Singer notes the shortcomings of the current state of the law by remarking generally, “while technologic change is speeding up exponentially, legal

change remains glacial.”⁴⁵ He continues by noting the International Committee of the Red Cross (ICRC) has not studied how robots fit into the body of International Law,⁴⁶ and Human Rights Watch is silent on the issue as well.⁴⁷ Yet, one U.S. military expert proclaims, “The lawyers tell me there are no prohibitions against robots making life-or-death decisions.”⁴⁸ Another opines, “There is no consensus yet on anything new and, unfortunately, I don’t think we are due for a breakthrough until something terribly bad happens.”⁴⁹

As technology pushes against the barriers set by international law, military attorneys must strive to remain one-step ahead of organizations, DARPA and its cabal of experts, turning science fiction into reality.⁵⁰ Lawyers will have to consider cases similar to the following hypothetical: If a drone pilot in Nevada directs an aircraft to drop a bomb on a group of unarmed civilians in Afghanistan, and that bomb injures or kills those people, then who can the military hold accountable?⁵¹

Singer refers to (but does not cite) a policy that holds the pilot responsible, as if he flew the plane and dropped the bomb.⁵² However, what if the drone malfunctioned? Would the analysis be the same if the pilot fired on the wrong group of people based on the direction of an on-scene commander? Which command handles the investigation and potential court-martial?⁵³ Would the Government have a viable breach of contract suit against the company that designed the robot?⁵⁴ From jurisdiction and command responsibility to products liability and negligence, unmanned systems pose more questions than answers.

Nonetheless, the United States, as the de facto leader in fielding “warbots,”⁵⁵ must adopt a workable standard to ensure compliance with the basic principles of the laws of

⁴¹ See Douglas Peifer, *Riskless War: Technology, Coercive Diplomacy, and the Lure of Limited War*, SMALL WARS J., May 12, 2009 (comparing robotic advances to other historical weapons developments that dupe nations into thinking “riskless wars” produce victories).

⁴² *Id.* at 9.

⁴³ See FM 3-24, *supra* note 31, app. B, para. B-7, app. E, paras. E-7, E-16 (noting “unmanned aircraft systems” utility in providing imagery, intelligence, surveillance, and target acquisition capabilities); see also U.S. DEP’T OF ARMY, FIELD MANUAL 3-24.2, TACTICS IN COUNTERINSURGENCY para. 6-79 (21 Apr. 2009) (acknowledging the ability of “robotics” to assist Soldiers in route clearance operations. Neither FM 3-24 nor FM 3-24.2 discusses the proposition raised in the text.

⁴⁴ SINGER, *supra* note 1, at 223 (citing the mission that led to Abu Musab al-Zarqawi’s demise).

⁴⁵ *Id.* at 387.

⁴⁶ *Id.* at 385.

⁴⁷ *Id.* at 388.

⁴⁸ *Id.* at 387; Tim Weiner, *A New Model Army Soldier Rolls Closer to the Battlefield*, N.Y. TIMES, Feb. 16, 2005, at A4 (quoting Mr. Gordon Johnson of the U.S. Military Joint Warfare Center).

⁴⁹ SINGER, *supra* note 1, at 387; Interview by P.W. Singer with Steven Metz, Professor, U.S. Army War Coll. (Sept. 19, 2006).

⁵⁰ SINGER, *supra* note 1, at 140.

⁵¹ See *id.* at 386.

⁵² *Id.*

⁵³ At the very least, attorneys assigned to units utilizing unmanned systems should seek theater-specific guidance concerning applicable policies, practices, and procedures involving robots.

⁵⁴ SINGER, *supra* note 1, at 399.

⁵⁵ *Id.* at 297.

war.⁵⁶ Singer supports the idea of a legal framework, when considering armed, autonomous robots: “[E]ither enact a legal ban on such systems soon or start to develop some legal answers for how to deal with them.”⁵⁷ A ban at this time seems implausible, given the tactical utility of various unmanned systems. However, the Department of Defense could direct service attorneys to conduct weapons reviews for every unmanned system in use, and develop guidelines to educate both commanders and lawyers on the legal employment of, and proper accountability procedures for, robots in war.

One final practical challenge for lawyers grappling with the legal implications of the exponential increase in unmanned systems⁵⁸ is the jaundiced view many military leaders hold toward lawyers. Singer corrals a herd of naysayers who complain the expanding role of lawyers in modern operations is akin to “Monday-Morning Quarterbacking.”⁵⁹ Unfortunately, this negative chorus adds little to do the discussion concerning the proliferation of robot use in warfare. The “Mullah Omar” story, which involves the alleged missed opportunity to engage a vehicle convoy carrying the Taliban leader apparently for the purpose of demonstrating how military lawyers have grown “too powerful” is neither new nor fully recounted, and arguments decrying “lawfare”⁶⁰ by the enemy do not help to define the legal issues involved when a nation employs robots to do Soldiers’ work.⁶¹ Singer overlooks the real

“Monday-Morning Quarterback” (the commander), whose duties require him to order an investigation into subordinates’ errors,⁶² decide whether to punish those Soldiers involved, and require all personnel under his command to abide by the laws of war.⁶³ Despite objections to the contrary, lawyers are a valid part of operations, and they will continue to play a key role in defining robots’ roles in war.

V. Conclusion

Wired for War is a well-written and well-researched book that should be on every military officer’s shelf. In an engaging, funny, and informative style, Singer leaves no stone unturned as he guides the reader through the momentous discoveries and monumental failures of the robotics revolution. The provocative second half of this work focuses on the manifold political, moral, ethical, and legal issues governments and individuals face as these unmanned systems find their way to different battlefields all over the world. The robotics revolution is here to stay, so purchase a copy of this book and determine if you agree that “[s]adly, our machines may not be the only things wired for war.”⁶⁴

⁵⁶ *Id.* at 410 (positing the application of pet law as a means of understanding autonomous system accountability).

⁵⁷ *Id.* at 409.

⁵⁸ *Id.* at 37; Lieutenant General David A. Deptula (USAF), *Unmanned Aircraft Systems: Taking Strategy to Task*, JOINT FORCES Q., No. 49 (2d Quarter 2008), at 50 (projecting “tens of thousands” of UAVs in future conflicts).

⁵⁹ SINGER, *supra* note 1, at 390.

⁶⁰ *Id.* at 391; *see also* Lawfare, the Latest in Asymmetries (transcript of Fiscal Year 2003 National Security Roundtable), Council on Foreign Relations, Mar. 18, 2003, *available at* <http://www.cfr.org/publication.html?id=5772> (“Lawfare is a strategy of using or misusing law as a substitute for traditional military means to achieve military objectives.”).

⁶¹ SINGER, *supra* note 1, 390, 391.

⁶² *See generally* U.S. DEP’T OF ARMY, REG. 15-6, PROCEDURES FOR INVESTIGATING OFFICERS AND BOARDS OF OFFICERS (2 Oct. 2006).

⁶³ MANUAL FOR COURTS-MARTIAL, UNITED STATES, R.C.M. 303 (2008) (“Upon receipt of information that a member of the command is accused or suspected of committing an offense or offenses triable by court-martial, the immediate commander shall make or cause to be made a preliminary inquiry into the charges or suspected offenses.”).

⁶⁴ SINGER, *supra* note 1, at 436.