Strategic Significance of Drone Operations for Warfare

The Growing Strategic Significance of Drone Operations for Warfare

Introduction

For over a decade, America's drone campaign has been driven by short-term objectives: the degradation of al Qaeda and militant groups like the Taliban through the use of targeted killings on a tactical scale. The targeted strikes, which occur in both battlefield settings and countries where the United States does not have troops deployed, are possible due to the lethal precision of armed drones. With their unprecedented reconnaissance capabilities and ability to stalk a target for hours, drones have become the hallmark innovation in the U.S. "War on Terror." Unmanned aerial vehicles (UAVs) have proven themselves to be the asymmetric tactical response to the asymmetric threat of militant networks, insurgencies, and other non-conventional targets.[1]

Both the U.S. military and Obama administration's embrace of drones, as well as drone development programs, signify that UAVs are outgrowing their tactical niche within the strategic framework of counterterrorism operations- instead they may soon become a common characteristic of modern militaries. In order to embrace the paradigm shift in the character of warfare brought about by drones, a UAV strategic framework is needed. However, growing public discourse regarding current drone use has obscured this larger military-technical development. Therefore, policymakers must look past the current drone debate in order to recognize the growing strategic role of future drone systems.

The following argument provides evidence for the evolution from the tactical to strategic nature of the platform. I will provide a history of drone technology and its development over the course of the 20th and early 21st century in order to create a foundation for discussing modern UAV deployment. Following the historical framework is an analysis of the turning point of drone use that occurred after the 9/11 attacks. I then turn to the contemporary drone debate and how it must be adjusted to fully capitalize on the emerging potential of the platform. Finally, I conclude with an outlook on the drones of the future, how they will change the nature of warfare, and the role of policy-makers in framing advances in military technology.

Historical Overview

While drones have only recently become a topic of public conversation, they have a lengthy history. UAVs claim a lineage as the progenitor of manned flight that dates back to the dawn of aerial warfare. The earliest cited example of the military application of UAVs dates back to the mid-19th century, when the Austrian military attacked the Italian city of Venice using balloons laden with explosives that were controlled by timed fuses.[2] Although balloons do not generally meet today's definition of a UAV, the concept was strong enough that once winged aircraft had been invented, the effort to fly them unmanned for military purposes was not far behind.

The early years of unmanned flight were indistinguishable from missiles. Rather than debating single-use versus reusable vehicles, military planners were investigating whether pilotless aircraft had any military purpose at all. At the turn of the twentieth century, the American military was studying the idea of unmanned, automatically controlled "aerial torpedoes." Shortly before WWI, the U.S. Navy was involved in the development of the Navy-Sperry "Flying

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Bomb," the first technology that demonstrated the concept of an unmanned aircraft. In another case, the Navy hired Elmer Ambrose Sperry, the inventor of the gyroscope, to develop a fleet of unmanned Curtis biplanes designed to be launched by catapult and fly over enemy positions.[3] The "aerial torpedoes," an early version of today's cruise missiles, were filled with TNT and guided towards an enemy position using a predetermined distance. Upon reaching the known distance of the target, the craft would essentially fall out of the sky onto the target. Research and development continued from 1915 to 1922, when the program's lack of progress along with a lack of funds forced the Navy to cancel the effort.[4]

While the Navy struggled with Sperry's invention, the U.S. Army developed a slightly more successful "flying bomb." The Army's Kettering Bug, the precursor to cruise missile technology, was a biplane that flew on a pre-set course using an on-board gyroscope and altimeter. Like the Navy, the Army cancelled the program soon after the end of WWI due to a lack of funding.[5]

During the Second World War, UAVs participated in a similar fashion to their use during WWI- retrofitted aerial vehicles designed to carry high explosives. For example, in 1944 the U.S. Navy launched a UAV program designed to destroy German bunkers. It used refitted B-24 bombers filled to double capacity with explosives and guided by remote control devices, crashing them at selected targets in Germany and Nazi-controlled France.[6]

The most infamous use of WWII UAVs was the German V-1 "flying bomb," which devastated London and other British cities.[7] The V-1 is considered the first cruise missile, was cost-effective, and employed in large numbers by German forces. In 1944 the United States reverse-engineered the V-1 from fragments of rockets that had landed in Britain to produce its own cruise missiles, almost identical to those of the Nazis.[8] Due to his wartime encounters with the crude rockets, Commanding General of the Army Air Forces Hap Arnold predicted that the future emphasis in air power would shift from pilots to scientists and machinery.[9] Arnold's endorsement of replacing soldiers with machines was a distinct break from traditional military culture, as American missile and assault drone production was not allowed to interfere with any other elements of the war effort during WWII. Nonetheless, Arnold's forecast represents the early discerning of a tactical and technological system that would not achieve its potential for over half a century.

Two different examples of pilotless aircraft emerged after WWII. The first example was cruise missiles or proto-drones, miniature versions of what the U.S. military had attempted to manufacture as far back as 1917. These autonomous missiles could be fired at the enemy from a great distance and at high velocity, but could also be guided using cameras. However, cruise missiles could not linger over a battlefield in the manner of a holding pattern nor could they return to base. Their weapons delivery was the missile itself- blunt and inflexible. The second example of unmanned aircraft was assault drones, which were slower than cruise missiles and could not operate outside one's line-of-sight. They lent themselves to roles in surveillance where television capability was used to gather intelligence. Similar to the contemporary development of UAVs, drones at the onset of the Cold War were relegated to ancillary roles, since the destructive capacity of cruise missiles occupied the attention of modern militaries. Despite resistance to the nascent technology, the slow progression of both drone and cruise missile technology represent the universal evolution of a growing distancing between soldier and weapon, as well as a desire for a precision strike capability.

"Flying bombs" became officially known as drones during the early years of the Cold War, and were used as aerial targets to train fighter pilots. The word "drone" was used because it denoted the aircraft's limited abilities, giving it a connotation of being disposable.[10] It was not until the Vietnam War in Southeast Asia that UAV technology had advanced to allow for a new combat role and a redefinition of the unmanned concept. Drones were given combat roles to replace manned reconnaissance flights due to concerns about American pilots being shot down over enemy territory. As a result, U.S. forces were estimated to have flown more than 5,000 surveillance missions using the plane-launched AQM-34 Ryan Firebee drone.[11] The Firebee was controlled by a ground operator using a remote control camera and was able to launch air to ground missiles as well as conventional bombs. The jet-powered drone could fly at subsonic speeds and accommodate numerous modifications and a variety of payloads. In addition to their reconnaissance and bomb damage assessment roles, the Firebee was used to bait and reveal North Vietnamese anti-aircraft installations, and was later used by the CIA to develop electronic countermeasures for such defenses.[12]

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The new application of pilotless aircraft marked a shift in the American military's conception of the drone platform: UAVs were developed to fill a role previously occupied by manned aircraft. From this point forward, UAVs would operate in roles traditionally occupied by manned aircraft, and began to be referred to as "remotely piloted aircraft," or RPAs.[13] This change in lexicon reflects a decisive shift from the general WWI and WWII label of "flying bombs" to a force-multiplying platform with the advantage of being able to take over functions of traditional manned aircraft. While UAVs were frequently deployed during the Vietnam War, they were not publicized nor recognized as a significant military platform worth developing. This was due to cultural resistances within the U.S. Air Force, which resulted in drone technology being largely abandoned until late in the 20th century.[14]

In 1973 war broke out in the Middle East in what came to be known as the Yom Kippur War. Israel employed UAV systems similar to those the U.S. deployed in Vietnam, but with greater accentuation and unprecedented effectiveness. Israeli forces integrated UAVs in joint operations with piloted aircraft to provide reconnaissance that was vital in helping the Israeli Defense Force halt the Arab advance and eventually repel the invading armies.[15] Impressed by Israel's success, general awareness and military-wide acceptance of UAV utility spread throughout the U.S. defense community. The United States quickly acquired a number of Israeli UAVs, which it used to develop the first modern American UAVs: the Hunter and the Pioneer. These drones underwent research and development in the late 1970s and 80s, making their combat debut during the Gulf War.

Modern American combat drones were first utilized during Desert Storm, or "the first UAV war."[16] According to a May 1991 Department of the Navy report, at least one UAV was airborne at all times during Desert Storm.[17] During military operations, with most of the U.S.'s manned tactical reconnaissance assets committed, UAVs emerged as a critical tool for gathering intelligence at the tactical level. These systems were employed for battlefield damage assessment, targeting, and surveillance missions, particularly in high-threat airspace. According to a 1993 congressional report from the House Oversight and Investigations Subcommittee, "The Pioneer unmanned aerial vehicle provided substantial imagery support to Marine, Army, and Navy units during Operation Desert Storm. They were so good many that more could have been used."[18] The intelligence officer for a Marine Division that was "blessed" with more UAVs than any other unit in-theater commented, "UAVs were great for target validation and battlefield damage assessment, but we could have used three times as many as we had."[19] The war confirmed the military utility of drones, both as a force multiplier as well as its utility in previously manned aerial operations.

After the Gulf War successfully demonstrated the effectiveness of UAVs, modern militaries began to invest in the research and development of combat UAVs, perhaps none more so than the U.S. military. The U.S. Predator drone was developed in the early 1990s through a program called the Advanced Technology Demonstrator Program for reconnaissance and forward observation roles.[20] While the pace of development of UAVs had reflected the pace of technology in general, major improvements in computing and electronic controlling systems in the 1980s and '90s made modern-day drones like the Predator possible. The invention of Global Positioning System technology, along with advances in micro-computing, ushered in the possibility of greatly advanced and automated unmanned flight. Due to these developments, it was in the late '90s that the U.S. Air Force made great strides in the technical aspects of arming unmanned aircraft with guided missiles.[21] Though the tactical usefulness of armed drones was still unknown, the emergence of network terrorism and their unconventional tactics soon predicated the need for a platform that could survey and strike select targets.

The Modern Drone Campaign

While U.S. drones were first used for battlefield reconnaissance, since the 9/11 attacks drones have evolved into America's preferred killing machines in the "War on Terror" as well as for locations where the U.S. military does not operate openly on the ground. Just months after 9/11, the first operational armed strike by an unmanned aerial vehicle took place in Afghanistan.[22] Since that first attack, the use of armed drones has risen dramatically to the point where drone strikes are now a common occurrence not only in battlefield settings, but also in neighboring countries where militants have attempted to seek refuge.

Though the evolution of UAVs has occurred rapidly over the past decade, scholars Leila Hudson, Matt Flannes, and Colin Owens divide the post-9/11 drone campaign's development into four phases.[23] The following sections

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describe these phases in order to highlight the embrace of drones by consecutive presidential administrations.

Phase One

The first phase, coinciding with the invasion of Afghanistan, served as a testing period of limited strikes on high-value targets like members of al Qaeda and the Taliban. It was during this phase that the first use of remotely piloted drones for missile attacks outside identified warzones took place. This attack occurred in northeastern Yemen in 2002, killing al Qaeda member Salim Sinan al-Harethi, who was suspected of masterminding the 2000 *USS Cole* bombing in Aden.[24] It also marked the beginning of the covert component of the drone war, which was kept out of view from the public and many government officials.

Phase Two

The second phase, coinciding with the 2007 surge in Iraq, consisted of a slight increase in strikes but retained the same target set: high-value terrorist suspects.[25] With combat operations and resources focused on salvaging what was left of the war in Iraq, American forces were stretched thin in terms of combat capabilities in the expansive and difficult terrain of Afghanistan. Drones provided a highly valuable force multiplier that made up for resources that were transferred from the Afghan theater to Iraqi battlefields. This phase is also characterized by the proliferation of attacks from warzones in Afghanistan to insurgent sanctuaries in the volatile tribal regions of Pakistan.[26]

Phase Three

The third phase of the drone war took place during the end of the Bush Administration. It consisted of an acceleration of attack frequency: 37 drone strikes occurred during 2008, compared to a total of nine from 2001-2007.[27] The success of the drone program during its first two phases gave the Bush Administration the impression that if limited drone strikes were successful in disrupting terrorist organizations, then increasing the use of unmanned precision strikes could play a pivotal role in combating the diffuse threat posed by militants on both sides of the Afghan-Pakistani border. Similar to the application of counterinsurgency doctrine in Iraq and subsequently Afghanistan to combat asymmetric insurgencies, drone warfare was seen as an emerging asymmetric tactical solution to asymmetric militant operations.

Phase Four

The most rapid proliferation of drone attacks occurred under the Obama Administration. Phase four of the drone program therefore consists of an expanded target list and attack frequency. The list expanded to include unidentified militants of dubious rank and other targets of opportunity like known militant safe houses.[28] It has been calculated that the Obama Administration has conducted roughly 370 drone strikes in Yemen and Pakistan (undeclared combat zones) since 2009. This is compared to close to 50 similar strikes during the Bush Administration.[29]

The Current Campaign

The growth in drone use has culminated in what Micah Zenko of the Council on Foreign Relations calls "America's third war."[30] This war, consisting of targeted killings in non-battlefield settings, has been a defining feature of post-9/11 American military policy as much as the conflicts in Iraq or Afghanistan.[31] Based on open source reporting, drones have conducted lethal strikes in six countries: Iraq, Afghanistan, Libya, Pakistan, Yemen, and Somalia. Of these countries, Iraq, Afghanistan, and Libya have been declared combat zones by the United States.

The two main actors in America's third war are Joint Special Operations Command (JSOC) and the CIA. Each organization runs their own drone program, utilizing similar technology and operational tactics but for very different purposes. The JSOC program is the military's version of the drone war. This part of the ongoing conflict is publicly acknowledged and operates in the recognized warzones of Afghanistan and Iraq, targeting U.S. enemies.[32] It is an extension of the conventional battle waged by American forces in Afghanistan and Iraq. In these two theaters, drones have functioned in a support role to combat operations: they primarily provide surveillance, and secondly they strike

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targets using precision-guided munitions. In declared combat zones, JSOC operates drones overtly, under a specific chain of command, and according to rules of engagement.

The CIA conducts the second campaign of the third war. The agency targets terror suspects around the world, including countries where U.S. troops are not actively operating. This campaign has been characterized by a lack of transparency and accountability on the part of U.S. officials. As a result it has become the focal point of public discourse on drone use. The program is classified as covert- the agency declines to provide any information to the public about where it operates, how it selects targets, who is in charge, or how many people have been killed.[33] Similarly, the deployment of drones to non-combat environments is not acknowledged by the government and therefore does not function under explicit public rules of engagement or chain of command. In Pakistan and Somalia, the CIA's lethal drone strikes are the primary tool used against suspected terrorists. In Yemen, the agency covertly operates drones in conjunction with special operations forces and the Yemeni Air Force to target suspected members of al Qaeda in the Arabian Peninsula.[34]

It is not difficult to understand the appeal of a "push-button" approach to fighting terrorist and militant groups like al Qaeda. However, the Obama Administration has embraced the drone program while maintaining the minimal governmental oversight that was present during the Bush Administration. As a result, the burgeoning drone debate reflects broad discontent among the population directed at the hidden bureaucracy that has directed the drone strike program.

The public outcry first began following the killing of Anwar Awlaki, the first time since the Civil War that the United States government deliberately killed an American citizen as a wartime enemy and without a trial.[35] The event caused a change in both the volume of coverage, which increased dramatically, and also the tone and depth. After the strike, journalists at *The New York Times*, *The Washington Post*, and other media outlets began to write more analytical and investigative articles about the targeted-killing program.[36] Since then, the debate has grown; information pertaining to presidential directives, target selection, and the institutionalization of drone policies has slowly leaked to the public, spurring a public consensus for disclosure as well as reform. Due to the Obama Administration's lack of transparency regarding the drone program, critics argue that the administration's failure to provide legal justification for the assassination of individual targets that are not declared combatants or operate within defined battlefield implicates the United States in violating international legal frameworks regarding the use of force.

Justification for the Third War

The Obama Administration has drawn on international law to justify the use of drones in response to public calls for transparency regarding targeted killings. Under the terms of the Laws of Armed Conflict and International Humanitarian Law, first the Bush Administration and now Obama Administration have argued that the attacks of 9/11 and the global campaign against groups like al Qaeda should be viewed as an ongoing war. As former U.S. State Department legal advisor Harold Koh put it, "As a matter of international law, the U.S. is in an armed conflict with al Qaeda, as well as the Taliban and associated forces, in response to the horrific 9/11 attacks, and may use force consistent with its inherent right to self-defense under international law."[37]

The Bush and Obama Administrations have also cited Article 51 of the UN Charter as further justification for drone use. The article cites that a state may use force if either a foreign nation agrees to the use of force within its territory or fails to take action against threats emanating from within its borders.[38] In the cases of Pakistan, Somalia, and Yemen, both conditions are satisfied; all three countries have consented to the United States operating drones within their territories, and all three are safe havens for groups that have launched violent attacks against the United States and American interests. [39] In Afghanistan, Iraq, and Libya, the United States was already engaged in combat operations. Therefore, the issue of legality regarding the use of drones does not apply.

Since 2011, the drone debate has expanded from concerns regarding legality to focusing on the moral and ethical challenges created by the Obama Administration's controversial growth of the drone program in what is shaping up to be a landmark episode in American history and both domestic and international law. Drone critics believe that

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strikes will soon occur in the United States, even though U.S. Attorney General Eric Holder, the primary defender of the drone program's legality, pledged in writing that this would never happen unless armed conflict breaks out on American soil.[40] This concern highlights public fears regarding war conducted behind a classified veil, relying on missile strikes rarely acknowledged by the American government, and a president with unprecedented authority to authorize drone strikes with little congressional oversight. It goes to the heart of a deeply rooted American suspicion about the government, the military and the surveillance state; the specter of drones streaking through the skies above American cities and towns, controlled by faceless bureaucrats and equipped to spy or kill. According to Brookings scholar Ben Wittes, "Over the last year or so, this thing that was the province of a small number of technologists and national security people has exploded into the larger public consciousness."[41]

In Defense of Drones

There are many benefits for the increased use of drones. Cruise missiles, fighter planes, and bombers work against fixed targets such as enemy forces or installations. They are not as useful, however, in today's asymmetric wars that are fought against insurgents and terrorists. Drones can loiter and maintain an "unblinking stare" over a chosen area for hours.[42] Thanks to the drone's ability to watch and wait, its operator, often thousands of miles away, can patiently choose the best moment to fire its missiles. This increases the chances of success while minimizing collateral damage and harm to civilians. As a result, drones are relatively more ethical than other weapons systems because they can be more discriminant.

The unique capabilities of drones are evident in their operational flexibility. While there is significant public backlash against American UAV use, the alternatives of using troops or manned systems to combat the threat emanating out of terrorist havens in Pakistan or Yemen is almost unthinkable. Alternative options would cause more unintended casualties due to lack of precision. With unreliable local security forces, an American ground attack would be even more costly in human, military, and political terms than employing drones. Unmanned strikes are America's least-worst option for pursuing terrorists in terms of cost and risk to American military personal. In addition, an analysis of acquisition and operating costs reveal that drones are more cost effective to acquire and operate than conventional manned aircraft.[43]

Drone technology has advanced to a point of sophistication that will likely give them a greatly expanded role in future wars. All currently employed drones are characterized by their staple roles in surveillance and reconnaissance operations. In addition, platforms like the Predator and Reaper have been outfitted with precision-guided munitions in order to reduce the strike time between target acquisitions and strike approval. The evolution of drone technology has been rapid, with new developments allowing for longer flight, heavier payloads, vertical takeoff from ships, and deployment to more areas of the world. While the Predator MQ-1 and Predator B (Reaper) MQ-9 are the most used and recognizable members of the drone fleet and have carried out most surveillance missions and attacks, new platforms are being deployed, like the RQ-4 Global Hawk and the MQ-8B Fire Scout.[44]

Ethical questions regarding current drone use are distracting us from an understanding of the significance and future implications of drones or Remotely Piloted Aircraft (RPA). In order to recognize the growing strategic framework of the technology, we need to separate the platform from impediments such as emotional and ethical concerns. The current debate prevents a clear understanding of the technology's potential on the part of American leadership- it distracts the administration and Congress from how drones can integrate into strategic planning beyond counterterrorism operations.

While the administration is focused on institutionalizing a drone strike "playbook," drone development is far outpacing attempts at formalization. The military is already addressing the future role of UAVs, which may make any ongoing attempt to codify drone use obsolete in the near future. Thus the playbook for the tactical use of drones as well as the public debate will soon become irrelevant as drones take on their own strategic framework. In order to embrace the paradigm shift of the UAV role within military force structure, it is best to adapt policymaking and accept the technology in breaking from traditional understandings of warfare.

The Drones of the Future

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In November 2012, the U.S. Navy loaded an X-47B, officially labeled an "unmanned combat air system," aboard the USS *Harry S. Truman* for the drone's first carrier-based testing.[45] The testing represents the beginning of developing successors to contemporary drones, which will be integrated into combat platforms like aircraft carriers. This signifies a remarkable break with current practices of operating drones in a strictly tactical, non-integrated capacity. Thus the X-47B illustrates the early stages of the U.S. military's long-term vision for drone warfare through the development of an unmanned combat aerial vehicle, or UCAV. Within this program the U.S. Air Force envisions a wide array of UAVs, from insect-like robots to tanker size pilotless planes, all of which are designed to perform the functions of traditional military aircraft while replacing the human pilot.[46]

The Air Force's plan to develop advanced drones and integrate them into an increasingly autonomous platform is laid out in their roadmap for the future titled, "Air Force Unmanned Aerial System (UAS) Flight Plan 2009-2047."[47] The Air Force envisions small-and medium-sized drones with lethal combat capabilities that would be almost unrecognizable compared to today's drone fleet. Today's medium-sized Reapers are set to be replaced by next generation MQ-Ma drones that will be "networked, capable of partial autonomy, all-weather and modular with capabilities supporting electronic warfare, close air support, strike, and intelligence, surveillance and reconnaissance missions."[48]

The MQ-Ma generation will be supplanted by the MQ-Mb, theoretically capable of taking over even more roles once assigned to traditional fighter-bombers and spy planes, including the suppression of enemy air defenses, bombing and strafing of ground targets, and surveillance missions. These will fly more autonomously and be better linked-in to other drone platforms for cooperative missions involving many aircraft under the command of a single "pilot." Imagine, for instance, one human operator overseeing a single command drone that in turn holds sway over a small squadron of autonomous drones carrying out a coordinated air attacks.[49]

The year 2047 is the U.S. Air Force's holy grail, "the capstone for its long term plan to turn the skies over to war-fighting drones."[50] By then, the USAF plans to have MQ-Mc dominating the skies with futuristic hypersonic drones. It is possible that 30 to 40 years from now, the MQ-Mc will incorporate all of the advances of the current MQ-M generation while being equipped for mission platforms like aerial combat and missile defense.[51]

Shaping the Future

Currently the United States has more or less a monopoly on drones, which will not likely last any longer than the American monopoly on nuclear weapons did after WWII. Drone technology is already proliferating, suggesting that the United States is not the only country that understands the future strategic significance of drones. Modern military powers such as Germany and India have announced plans to acquire combat drones, while several other countries have growing UAV capabilities, most notably the Chinese, Iranians, and Russians.[52] Of these three countries, China poses the most significant threat in terms of UAV capability.

China is fast developing tactical unmanned aerial vehicles capable of supporting ground, sea, and air forces with similar capabilities to American platforms.[53] According to a 2013 report by the Project 2049 Institute:

In a worrisome trend, China has ramped up research in recent years faster than any other country… It displayed its first unmanned system model at the [annual] Zhuhai air show five years ago, and now every major manufacturer for the Chinese military has a research center devoted to unmanned systems.[54]

The report, which said "the military significance of China's move into unmanned systems is alarming," suggested that China could "easily match or outpace U.S. spending on unmanned systems, rapidly close the technology gaps and become a formidable global competitor in unmanned systems."[55] Two Chinese drones that closely resemble the American Reaper and Predator UAVs were unveiled at the Zhuhai air show in China in November of 2012. The Chinese arsenal also possesses a larger drone that Western experts say is modeled after the American RQ-4 Global Hawk.[56] The proliferation of armed drones in other nations is indicative of the platform's increasing strategic significance as countries recognize UAVs as a valuable war fighting tool that will play a vital role in future conflicts.

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Paralleling the proliferation of drone technology as well as the rapid pace of American drone capabilities is an organizational shift that symbolizes the growth of the UAV role within U.S. military force structure. The Air Force is beginning to recruit separately for drone programs since the type of individual operating a drone is extremely different from those piloting fighter jets both mentally and physically. A new talent pool is drawing on a generation that has grown up surrounded by technology and therefore has a greater aptitude for dealing with unmanned systems.[57] The move to identify new skill sets represents a profound cultural change within the Air Force and U.S. military as a whole. The growth of the RPA community and its integration within the Air Force indicates a larger organizational shift within the military to embrace the rising RPA platform.

Further evidence of the drone's strategic evolution within the military is a growing tension between the Department of Defense and clandestine drone operators. In a *National Journal* article, journalist Michael Hirsh argues that current CIA Director John Brennan thinks that, "the drone program has run its course as a CIA operation" and that moving the a program to the Department of Defense (DoD) is the way of the future.[58] A proposed transfer of the operational network to the DoD would unify the command and control structure of targeted killings and create a uniform set of rules and procedures. According to *The Daily Beast* reporter Daniel Klaidman, the move could potentially toughen the criteria for drone strikes, strengthen the program's accountability, and increase transparency, as the military would have operational control over targeting. Lethal missions would take place under Title 10 of the U.S. Code of Laws, which outlines the role of the armed forces, rather than Title 50, which outlines the legal authority for intelligence activities and covert operations.[59] This possible organizational modification represents the growth of the program from a simple tool of counterterrorism to assuming a broader role within the U.S. military and defense community.

Will drones lead to more war in the future? Or a "space race" within drone technology, leading up to a world filled with drone warfare on all sides?[60] It has been argued that virtual technologies make it easier for democracies to wage war because they eliminate the risk of blood sacrifice that once forced prudence. Indiana Congresswoman Susan Brooks wrote in *The Washington Post*:

Drones will not reduce conflict. Their very ease of use will tempt nations, our own very much included, to engage in automated conflict. The problem with automated conflict, however, is that it doesn't stay automated. People die in drone wars, just like they died from the automation of arrows when the crossbow was invented. War machinery has a terrible capacity to tempt us to think it's something else.[61]

Proponents of this line of thought argue that technology disengages the public and instead turns war into something merely to be watched and not weighed with great seriousness. Without public debate or risking troops, the decision of war may reflect a nation that does not care due to the lack of lives invested in a conflict.

Others have dismissed the idea that drone weaponry by itself will subtract humanity from warfare. According to Adam Elkus in his article *Weapons Don't Make War*, human psychology and human emotions are still a primary driving force behind wars, and technological advances have not substantially curbed that element of warfare in the past. He argued:

Despite the nearly century-long prevalence of airpower, we have not become numb to war. Airpower, drones included, has not erased emotion from war because war is a complex mixture of irrational forces, chance, and rational policy. And as long as humans are involved in conflict, these forces will continue to exert themselves on the theory and practice of war.[62]

Thus, rather than drones determining the frequency of future conflicts, they will likely define its characteristics. As unmanned systems become more prevalent, militaries will be more likely to use force, but also will be less willing to conduct operations that expose soldiers to danger. As a result, the experience of going to war is changing. Humans are increasingly functioning "on the loop" of combat systems, overseeing the autonomous actions of vehicles rather than participating directly. Simultaneously, advances in artificial intelligence will enable systems to make combat decisions without necessarily requiring human input.[63] Such weapons seem advanced, but represent just the beginning. "There has been a game change in weaponry over the last several years," Peter Singer and Thomas

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Wright say, "with a new generation of advanced technology that moves the point of critical human decision, both geographically off the battlefield and also, increasingly, chronologically away from the time of kinetic action."[64]

New UAV technology will be like every other in initiating a new evolution in military platforms and doctrine. However, unlike previous military "revolutions," Peter Singer writes that "the introduction of unmanned systems to the battlefield doesn't change simply how we fight, but for the first time changes who fights at the most fundamental level. It transforms the very agent of war, rather than just its capabilities."[65] He goes on to say, "In the dismaying history of war machinery, armed drones are a game-changing technology, akin to gunpowder, the steam engine, the atomic bomb, opening up possibilities that were fiction a generation earlier but also opening up perils that were unknown a generation ago."[66]

Therefore, while drones currently present a narrow tactical benefit, they posses tremendous potential that could spur the U.S. military to an onset of a decades-long technological transformation in warfare that will be defined by the strategic use of unmanned aerial platforms. UAV technology could spur a paradigm shift in the nature of warfare, comparable to the introduction of mechanization and airpower in WWII.

Conclusion

The application and integration of unmanned aircraft in the early 21st century mirrors the rise of manned planes in the early 20th century. Historically, the drone platform has faced skepticism and cultural opposition, followed by limited use in reconnaissance roles. RPAs were slowly integrated into ad-hoc roles, and now they are at a pivotal point in their evolution from operating in a tactical niche to occupying a defining role in future battles.

In the words of a U.S. Army colonel, "We are building the bridge to the future while standing on it."[67] Policy-makers must formulate a strategic framework for drones as a first step towards being prepared to act in a rapidly advancing technological world with complex strategic implications for U.S. military strategy and power projection. The speed and difficulty of policy making must be accounted for in order to create an effective doctrine for using unmanned aircraft. If the U.S. military and policy-making community get the strategic framework right, it will win the wars of the future. If it does not, it might build what one U.S. Army officer called, "The Maginot Line of the 21st century."[68]

As the United States' strategic landscape changes, new technologies are integrated into American planning efforts. Platforms like drones have evolved within the strategic framework of the U.S. defense and policymaking community, and are now poised to play a focal role in the future of American power. However, the current policy debate and public discourse lags behind the evolution of the technology. Policy-makers are fixating on the use of the platform for targeted killings. This use is not indicative of the significance of neither drones nor their future use. With the proliferation of remotely operated and automated combat aircraft, the trend in military technology is moving toward missions carried out by automated warriors, with the human operators battling safely behind computer terminals miles away. Leaders must recognize that being on the leading edge of technology uncovers new societal questions. Thus one of the biggest effects of the UAV is in reshaping the narrative of warfare in how we conceptualize war, how we talk about it, and how we report it. Future campaigns will feature new questions about what is legal and ethical, resulting in dilemmas that will challenge many of the codes that have long shaped and regulated the practice of warfare. Therefore we are in the beginning of a process that will be of historic importance, as drones are forcing societies to reexamine what is possible and proper in war and politics.

Given the rapid advancement of UAV technology and its global proliferation, it is time to start thinking about the future strategic implications of the platform. As the situation surrounding these once science fiction-like weapons has changed, so too must the public debate to reflect the growing presence of drones within military force structures. We are on "terra incognita" and must create a new approach to warfare that is characterized by rapidly advancing technological systems.

[1] The UAV, referred to as a drone in media and public circles, is an aviation system that at its core is an uninhabited, reusable aircraft that sustains flight using onboard propulsion and aerodynamic lift. UAVs do not include lighter-than-air craft such as balloons, blimps, or airships, or systems like ballistic missiles that do not employ

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Written by: Jack Miller
Written at: University of Pennsylvania
Written for: Dr. Kathryn Tenpas
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