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The Birth of a Drone Nation: American Unmanned Aerial Vehicles Since 1917

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THE BIRTH OF A DRONE NATION: AMERICAN UNMANNED AERIAL VEHICLES SINCE 1917

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ABBREVIATIONS

ARGUS-IS: Autonomous Real-time Ground Ubiquitous Surveillance-Imaging System

CORDS: Civil Operations and Revolutionary Development Support

DARO: Defense Airborne Reconnaissance Program

DARPA: Defense Advanced Research Project Agency

DARP: Defense Airborne Reconnaissance Program

DHS: Department of Homeland Security

FAA: Federal Aviation Administration

GVN: Government of Vietnam

JSOC: Joint Special Operations Command

JUSPAO: Joint United States Public Affairs Office

ICEX: Intelligence Coordination and Exploitation Program

MOE: Measures of Effectiveness

MOP: Measures of Performance

NRO: National Reconnaissance Office

PRU: Provincial Reconnaissance Units

UAV: Unmanned Aerial Vehicle

USAAC: United States Army Air Corps

USAAF: United States Army Air Force

VCI: Viet-Cong-Infrastructure

ABSTRACT

Drones have entered American consciousness and society. Little attention, however, has been paid to how America got here, how it became a drone nation. This thesis seeks to counter the "New Drone" misconception, the general ignorance of drone history present in the historiography, and popular perception of the subject.

Chapter one, "The "New Drone" Misconception: Unmanned Aerial Vehicles in the World Wars," examines America's first experiments with military drones. Charles Kettering, "Hap" Arnold, and Reginald Denny were among the first to recognize UAV potential and garner American support. The main motivation for drone use--removing American soldiers from danger--was first recognized during this period. These overlooked early drones suggest that contemporary parallels, such as imprecision and civilian casualties, are not new.

Chapter two, "The 'Inevitability' of Drones and the Cold War" questions the inevitability of drone adoption. Such perceived inevitability creates a futuristic image, with connotations of superiority leading to blanket acceptance. Examining drone development during the Cold War reveals a very different reality. Drones faced major obstacles, including technical limitations, expense, and competition from other emerging technologies.

Just as drone technology is not new, neither are the facile policies which guide its use. Chapter three, "American Counterinsurgency: The Phoenix Program in Vietnam and Contemporary Drone Policy," is a comparative analysis of American counterinsurgency efforts. The integration of drone strikes into counterinsurgency efforts, especially in unofficial war zones such as Pakistan, has led to popular interest and concern. Many of the same problems

(inefficiency, civilian casualties, corruption, and public outrage) that plague drone use also haunted America's efforts with the Phoenix program.

Because of the potential drones hold today, careful consideration of their problematic history is essential. Protecting Americans from war by replacing soldiers with drones has been a century long effort. Yet drone use has consistently produced the same warping effect on American experiences in war. Expensive and technologically limited UAVs have been deployed inefficiently. The covert nature of many drone programs bred distrust, encouraged immoral use, and shielded those responsible from condemnation. Even worse, these efforts accomplished little and were typically counter-productive.

INTRODUCTION:
THE BIRTH OF A DRONE NATION

In 2001 America first fired a Hellfire missile from a Predator drone. The initial test came in February, before the September 11th terrorist attacks which became the impetus for the contentious conflicts in which drones have become so common. The Global War on Terror led to quick military adoption of armed Predators, and their more capable incarnation, the Reaper. These Unmanned Aerial Vehicles (UAVs), capable of waging war without endangering American troops, were used extensively in the official war zones of Iraq and Afghanistan as well as covertly in Somalia, Yemen, and Pakistan. [1] Secret operations have often been controversial; questions concerning precision, civilian casualties, and international law are frequently raised. The wide adoption of this seemingly revolutionary technology has had a major impact on America's military, foreign policy, and image at home and abroad.

Drones have lodged themselves into American consciousness and society. Drone strike stories make the twenty-four hour news cycle regularly. They either successfully proclaim the assassination of a major terrorist leader, or decry the unintended death of civilians.

UAVs inundate American popular culture. Filmmakers include them in their movies, frequently offering a moral message. The 2013 film *Oblivion* stars Tom Cruise as a drone repairman in a dystopian future. The drones are revealed to be evil, killing the innocent remnants

[1] Terminology is a tricky subject when dealing with drones. Most military personnel and aeronautical engineers would use the term drone to reference simplistic target drones which "fly in a persistently dull, monotonous, and indifferent manner." These groups are so stringent in their pursuance of correct terminology that they prefer to use an overwhelming number of acronyms (a practice substantiated by an interview with a military commander[2]) sure to confuse casual readers. Various terms are Unmanned Aerial System (UAS), Remotely Piloted Aircraft (RPA), Remotely Piloted Vehicle (RPV), and Unmanned Aerial Vehicle (UAV), but the word "drone" is unpopular with the military. However, the media, American public, and politicians, have widely adopted "drone." This study will use the term "drone" for general understanding, but also "UAV" since it is considered the correct reference to any unmanned aerial vehicle. Paul Fahlstrom and Thomas Gleason, *Introduction to UAV Systems*, 4th ed. Aerospace Series, (Chichester; Wiley, 2012), Accessed February 8, 2013, LSU Libraries, 7; Anonymous Air Force, Colonel, "UAV Q and A," e-mail interview by author, April 3, 2013.

of humanity.[2] *Zero Dark Thirty*, which tells the story of "the greatest manhunt in history," as the CIA pursues Osama Bin Laden, features drones and more drones.[3] Predator drones were even used to spy on Superman. The man of steel crashes a Predator drone in front of a General's car, insisting on his privacy.[4] Many more examples exist, many in production.

Television is not immune to this fascination with drones. One of the primary antagonists in the premiere season of Showtime's *Homeland* is fictional Al-Qaeda leader Abu Nazir whose vengeful pursuits are inflamed after his son is killed in a CIA drone strike.[5] *Homeland* won two Golden Globes and six Emmys in 2012, including Outstanding Drama Series and Best Television Series-Drama.[6] The second season of HBO's *Newsroom*, which retroactively discusses the past year's major stories from the perspective of a cable news team, focused attention on President Obama's drone policy.[7] The primary antagonist of Fox's 2014 reincarnation of *24* is fictional Al-Qaeda operative Margot Al-Harazi. After her husband is killed in a drone strike, she plots to assassinate fictional U.S. President James Heller with stolen drones.[8]

The recent iterations of the Call of Duty videogames also include drones. As one of the most successful franchises of all time, selling nearly 140 million copies worldwide, its cultural prevalence is immense.[9] In competitive multiplayer, gamers are given "Killstreak" rewards after killing enough people on the other team. The "UAV Recon" killstreak reward calls in a

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[2] *Oblivion*, dir. Joseph Kosinski, perf. Tom Cruise and Morgan Freeman (New York: Universal Pictures, 2013), film.

[3] *Zero Dark Thirty*, dir. Kathryn Bigelow, perf. Jessica Chastain (Chandigarh, Punjab, India: Columbia Pictures, 2012), film.

[4] *Man of Steel*, dir. Zack Snyder, perf. Henry Cavill (Lone Pine, California: Warner Bros., 2013), film.

[5] Howard Gordon and Alex Gansa, writers, "Homeland," Showtime, 2011.

[6] "Homeland-Awards," IMDb, accessed April 27, 2014, http://www.imdb.com/title/tt1796960 /awards?ref_=tt_awd.

[7] Aaron Sorkin, writer, "The Newsroom," HBO, 2013.

[8] Robert Cochran and Joel Surnow, writers, "24: Live Another Day," Fox, 2014.

[9] "Call of Duty Franchise Game Sales Statistics," Statistic Brain RSS, February 19, 2014, accessed May 15, 2014, http://www.statisticbrain.com/call-of-duty-franchise-game-sales-statistics/.

reconnaissance UAV, revealing the location of opposing players. The "Predator Missile" killstreak lets users guide a Hellfire missile fired from a Predator drone. They are among the most easily acquired and frequently used killstreaks in the game.[10]

Drones are also venturing into daily life. The ACLU has directed its ire at the Federal Aviation Administration's (FAA) regulation changes which enable greater drone use by local law enforcement. Concerns include privacy protection as well as drones equipped with non-lethal weapons, including rubber bullets and Tasers.[11] The Department of Homeland Security (DHS) uses drones for border patrol. Congressional hearings revealed that the Customs and Border Protection Agency has repeatedly lent drones to local law enforcement, a practice which Secretary Jeh Johnson supported.[12] Drones were reportedly used during the manhunt for cop-killing ex-cop Christopher Dorner, though the DHS said this was false. An unarmed Predator drone was used in 2011 to find the Brossart family, a group of anti-government separatists.[13]

Drone policy, at home and abroad, has inspired satirical critiques. One of the most inventive came from fashion designer Adam Harvey who designed a line of anti-drone clothing. It features a hoodie, scarf, and burqa made of metalized material which impedes thermal imaging cameras.[14] Online retailer Amazon made headlines, and faced ridicule, when it introduced its

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[10] *Call of Duty 4: Modern Warfare* (Xbox 360). Developer: Infinity Ward, Publisher: Activision, 2007; *Call of Duty: Modern Warfare 2* (Xbox 360), Developer: Infinity Ward, Publisher: Activision, 2009; *Call of Duty: Modern Warfare 3*, (Xbox 360), Developer: Infinity Ward, Publisher: Activision, 2011. The original Call of Duty 4: Modern Warfare has the "Radar" killstreak which deploys a reconnaissance UAV, Call of Duty: Modern Warfare 2 and 3 both have the "UAV Recon" and "Predator Missile" killstreaks.

[11] "Domestic Drones," American Civil Liberties Union, accessed April 26, 2014, https://www.aclu.org/blog/ tag/domestic-drones.

[12] Stephen Dinan, "Jeh Johnson Wants Homeland Security Drones Focused on Border," *Washington Times*, February 26, 2014, accessed May 3, 2014, http://www.washingtontimes.com/news/2014/feb/26/jeh-johnson-wants-homeland-security-drones-focused/.

[13] "Dorner: A Drone Target on U.S. Soil," Salon, February 11, 2013, accessed May 1, 2014, http://www.salon.com/2013/02/11/dorner_a_drone_target_on_u_s_soil/.

[14] Amanda Kooser, "Anti-drone Hoodie and Burqa Hide You from Surveillance," CNET, April 4, 2013, accessed April 27, 2014, http://www.cnet.com/news/anti-drone-hoodie-and-burqa-hide-you-from-surveillance/.

Prime Air delivery service, making use of drones to deliver packages. There was justifiable skepticism. The FAA is waiting until 2020 to begin certifying commercial drones. Amazon's announcement also came the Sunday before Cyber Monday, thus gaining attention right before the largest online shopping day of the year.[15]

Average citizens also use drones. A large hobbyist community enjoys building and tinkering with them. Drones are making farming easier. Farmers use camera equipped-UAVs to conduct autonomous crop monitoring. This makes monitoring large swaths of land much easier, and aids in determining fertilizer and pesticide use. The FAA is concerned and still drafting the regulations for agricultural drones. Near-collisions with passenger jets have occurred.[16]

Drones have clearly entered American consciousness and society. Little attention, however, has been paid to how America got here, how it became a drone nation. This thesis seeks to counter the "New Drone" misconception, the general ignorance of drone history present in the historiography, and popular perception of the subject. Actually, there has been nearly a century of American drone development.

Chapter one, "The "New Drone" Misconception: Unmanned Aerial Vehicles in the World Wars," examines America's first experiments with military drones. Charles Kettering, Henry Harley "Hap" Arnold, and Reginald Denny were among the first to recognize UAV potential and garner American support. Arguably the main motivation for drone use--removing American soldiers from danger--was first recognized during this period. These overlooked early

[15] Nicholas Carlson, "The Real Reason Amazon Announced Delivery Drones Last Night: $3 Million In Free Advertising On Cyber Monday," *Business Insider*, December 02, 2013, accessed May 5, 2014, http://www.businessinsider.com/why-amazon-announced-delivery-drones-2013-12.

[16] Steve Henn, "High-Ho, The Derry-O, The Farmer And The Drone," NPR, May 10, 2014, accessed May 20, 2014, http://www.npr.org/blogs/alltechconsidered/2014/05/10/311143655/high-ho-the-derry-o-the-farmer-and-the-drone.

drones suggest that contemporary parallels, such as imprecision and civilian casualties, are not new.

Chapter two, "The 'Inevitability' of Drones and the Cold War" questions the assumption that drone adoption was inevitable. Such perceived inevitability creates a futuristic image, with connotations of superiority leading to blanket acceptance. Examining drone development during the Cold War Era reveals a very different reality. Drones faced major obstacles, including technical limitations, expense, and competition from other emerging technologies. It took until the 1990s for drones to truly prove themselves.

Just as drone technology is not new, neither are the facile policies which guide its use. Chapter three, "American Counterinsurgency: The Phoenix Program in Vietnam and Contemporary Drone Policy," is a comparative analysis of American counterinsurgency efforts. The integration of drone strikes into counterinsurgency efforts, especially in unofficial war zones such as Pakistan, has led to popular interest and concern. Many of the same problems (inefficiency, civilian casualties, corruption, and public outrage) that have plagued drone use also haunted America's efforts with the Phoenix program.

Because of the potential drones hold today, careful consideration of their problematic history is essential. Protecting Americans from war by replacing soldiers with drones has been a century long effort. Yet drone usage has consistently produced the same warping effect on American experiences in war. Expensive and technologically limited UAVs have been deployed inefficiently. The covert nature of many drone programs bred distrust, encouraged immoral use, and shielded those responsible from condemnation. Even worse, these efforts accomplished little and were typically counter-productive.

CHAPTER ONE:
THE "NEW DRONE" MISCONCEPTION: UNMANNED AERIAL VEHICLES IN THE WORLD WARS

Popular perception of America's drones sees them as a new technology, a seemingly futuristic revolution of warfare which allows unmanned aircraft to perform important military tasks without a pilot physically present in the vehicle. In reality, this belief is a misconception. Few realize how long Unmanned Aerial Vehicles (UAVs) have been a part of the American military. First receiving military backing in World War I and continuing throughout the 20th century, drones have long been used for combat, training, and reconnaissance tasks by the American military. This history of drone use can provide perspective for modern drone policy. Recent expansion of drone use has received a great deal of attention from citizens, media, and politicians. Their primary utilization in the Middle East for surveillance and assassination has created concerns over international law and civilian casualties. There is a price to be paid: the more drones are used for questionable military actions, the worse their public perception becomes. This chapter examines early UAVs to refute the "new drone" misconception, demonstrate that drones have accomplished more than their latest uses, and show how issues concerning drone policy were dealt with in the past.

America's use of drones greatly expanded during the War on Terror. Drones are valuable military technology, recognized for their combat and surveillance uses. News sources frequently portray drones as the wave of the future in military aeronautics, forgetting significant earlier uses of drones.

This misconception of UAVs as new has been perpetrated by respected media outlets such as *The Washington Post*, *The Economist*, and *The New York Times*. A documentary for the Public Broadcasting Service's (PBS) Nova series, "Rise of the Drones" claims to expose viewers

to "a new chapter of aviation history."[17] In this pursuit of the new, the documentary ignores decades of early drone use as too costly and technologically limited for meaningful examination. Not only does "Rise of the Drones" ignore history, but it does not note that modern drones have these same problems. Similarly, a *New York Times* article entitled "A History of Drone Warfare" only goes back to 2001 with the initial weapons testing of the Predator drone.[18]

The media give aeronautical engineer Abe Karem and the Defense Advanced Research Project Agency (DARPA) the credit for America's drones. Karem, whose drone prototype Amber was the basis of the modern Predator drone, and DARPA, which developed many of the technologies used by modern drones, have certainly made important contributions, but presenting only their recent accomplishments is misleading. *The Economist* calls Karem "The dronefather," giving him sole credit for creating "the robotic plane that transformed the way modern warfare is waged."[19] Similarly, the *Washington Post*'s treatment of the history of UAVs focuses only on Karem's contributions.[20]

Past scholarship on early drones is frequently incomplete. Most accounts begin with those built by Ryan Aeronautical Company for use in the Cold War. Thomas P. Ehrhard's *Air Force UAVs: The Secret History* gives a short history of America's drones, but does not consider pre-Vietnam drones worthy of coverage. Kenneth P. Werrell's, *The Evolution of the Cruise Missile,* discusses precursors, but as the title of his 1985 book suggests, in relation to cruise missiles, not UAVs. Aeronautic enthusiasts are devout compilers of data but offer little more

[17] *Rise of the Drones*, Directed by Peter Yost, (2013), Television Broadcast, Accessed February 24, 2013, http://www.pbs.org/wgbh/nova/military/rise-of-the-drones.html.

[18] "A History of Drone Warfare," *New York Times* (New York), May 24, 2013, A8 sec.

[19] "Brain Scan: The Dronefather," Economist.com, (December 1, 2012), Accessed January 30, 2013.

[20] Peter Finn, "Rise of the Drone: From Calif. Garage to Multibillion-dollar Defense Industry," Washington Post, (December 23, 2011), Accessed January 31, 2013.

than factual information. America has been using drones for most of the 20th century, something largely ignored by these sources.

Though Abe Karem has been deemed the "dronefather" by the media, other people such as Charles Kettering, Reginald Denny, and especially Henry Harley "Hap" Arnold were instrumental in developing UAVs. Hap Arnold's contributions to early UAVs are briefly mentioned in biographies but are overshadowed by his numerous other accomplishments. Frequently called a pioneer[21], Arnold was one of America's first military pilots. He learned to fly directly from the Wright brothers and received the second-ever pilot's license issued by the military.[22] As a pilot he was a two-time winner of the Mackey trophy, awarded for "the most meritorious flight of the year."[23] By 1938 he had become the commanding officer of the United States Army Air Corps (USAAC), a position he held throughout World War II, as the Air Force became a separate service arm, the United States Army Air Force (USAAF). Arnold expanded America's pitiful air power of "2,000 airplanes and 21,000 personnel" to the largest aeronautical war machine the world had ever seen with "79,000 airplanes and 2,300,000 personnel."[24] Arnold should also be recognized for his support of early drones which paved the way for later innovations and aided the development of today's drones.

[21] "Hap Arnold Lecture Series, Air War College, Air University," Hap Arnold Lecture Series, Air War College, Air University, accessed February 19, 2013, http://www.au.af.mil/au/awc/outreach-program/index.htm; Flint O. DuPre, "Biographies : General Henry H. Arnold," The Official Website of the U.S. Air Force, accessed February 19, 2013, http://www.af.mil/information/bios/bio.asp?bioID=4551.

[22] Thomas M. Coffey, *HAP: The Story of the U.S. Air Force and the Man Who Built It, General Henry H. "Hap" Arnold* (New York: Viking Press, 1982), 48-53.

[23] "Trophies and Awards at the National Air and Space Museum," Smithsonian: National Air and Space Museum, accessed April 23, 2013, http://airandspace.si.edu/research/aero/trophy/mackay.cfm.

[24] *Gen. Henry H. Arnold*, National Museum of the US Air Force, Accessed March 1, 2013, http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=8526.

The Kettering Bug

The first UAV to receive military support was developed during World War I. The official name for this early drone was "Liberty Eagle," but it is more commonly referred to as the Kettering "Bug" to honor its inventor, Charles F. Kettering, who had been assigned to evaluate the possibility of developing an aerial torpedo. Kettering, eventually a major figure at General Motors, had already established himself as an outstanding engineer. He invented the Electric Self-Starter which helped Cadillac win the Dewar Trophy in 1913, the highest automotive prize at the time.[25] He witnessed the successful flight of a small pilotless plane guided by a simple auto-pilot system. Kettering insisted that this proof of concept flight demonstrated the plausibility of aerial torpedoes, and he personally directed the Bug's expansion.[26]

Fig. 1 Charles Kettering[27]

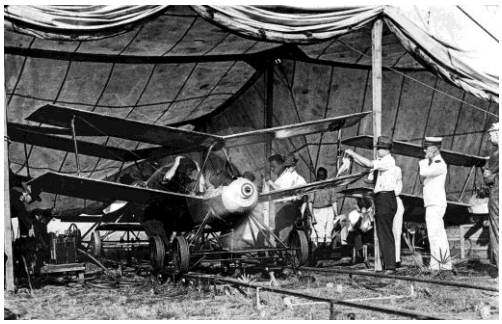

Fig 2. The Kettering "Bug"[28]

As seen in Fig. 2, the Kettering "Bug" was launched with a four-wheeled dolly and portable track. The Bug had an internal system of "pre-set pneumatic and electrical controls" which acted like modern auto-pilot systems, stabilizing and guiding the drone to its target. The

[25] "Kettering, Charles F.," Generations of GM RSS, accessed February 27, 2014, http://history.gmheritagecenter.com/wiki/index.php/Kettering%2C_Charles_F.

[26] Andreas Parsch, "Dayton Wright/Kettering Liberty Eagle "Bug," (May 12, 2005), Accessed April 01, 2013, http://www.designation-systems.net/dusrm/app4/bug.html.

[27] *Charles F. Kettering, Engineers Club of Dayton, Dayton, Ohio, accessed January 30, 2014, http://www.daytoninnovationlegacy.org/kettering.html.*

[28] "KETTERING AERIAL TORPEDO "BUG,"" National Museum of The US Air Force, March 21, 2007, Accessed February 11, 2013. http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=320.

amount of flight time needed to reach a target was programmed into the Bug, and once it had flown for that amount of time, presumably reaching its target, the engine shut off. After deactivation, the wings released, plunging the drone and the explosives it carried to the ground where it detonated on impact.[29]

Built to be a self-sacrificing weapon, the Kettering Bug was constructed of cheap materials. The body was made of papier-mâché, its wings made of cardboard. Despite its disposable nature, the Bug's 40-horsepower engine allowed it to carry up to 300 pounds of explosives and reach a speed of 50 mph.[30]

Though the Kettering Bug bears Charles Kettering's name, Hap Arnold was also instrumental in its development. Despite frequent requests for a combat position during the war, he was kept in Washington, D.C. During World War I, Arnold was the second-highest ranking officer in the War Department's Air Division, and for a majority of the war, the highest ranking pilot in Washington. He had become a Colonel by August 1917, the youngest in the Army at the time.[31] His relatively-rare expertise was likely the reason for his appointment to multiple aviation boards such as the Joint Army and Navy Technical Board, for which he was to "investigate new types of air-craft and accessories and to make recommendations covering types that would be placed into production by the Army and Navy."[32] He saw the potential that an unmanned-plane

[29] *Ibid*.

[30] *Splendid Vision, Unswerving Purpose: Developing Air Power for the United States Air Force during the First Century of Powered Flight* (Wright-Patterson Air Force Base, OH: History Office, Aeronautical Systems Center, Air Force Materiel Command, 2002), 22.

[31] Henry Harley Arnold, *Global Mission.* (New York, NY: Harper, 1949), 48.

[32] Henry H. Arnold, *World War I Duties,* Journal, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989,* Microfilm, reel 3.

bomb would have for World War I's trench warfare, and used his position in the War Department to support the Kettering Bug.[33]

Driven by a passion to advance aeronautical technology, Arnold also pushed military leaders to support the Bug.[34] Arnold invited military leaders to witness a test flight of the Bug at the Dayton air field. However, the Bug malfunctioned, sputtered in the air, and fell dangerously close to those who had assembled. No one was seriously injured; a second test flight went as planned.[35]

The Bug never saw combat. Its successful October 2, 1918, flight test took place just a month before the Armistice with Germany.[36] According to Arnold, "it was planned to launch thousands every day against German strong points, concentration areas, munitions plants, etc."[37] Reports of the Bug's flight tests boast of its range and accuracy. Despite this optimism, there were concerns over the Bug's reliability, particularly if it flew over Allied troops.[38] It is unclear what the origins of concern were, though a failed test before military leaders in Dayton surely did not help. The Bug's cheap components and the revolutionary nature of the project itself may have also worried military leaders.

Since the Bug was never used in combat, it has largely been ignored. Fewer than fifty were built before the Armistice. Even though the Kettering Bug did not actively contribute to the war effort, it was still significant. It reveals the American military's desire for a relatively accurate way of bombing targets from the air without risking the lives of pilots. It was the first

[33] Arnold, Global Mission, 74-75.
[34] DeWitt S. Copp, *A Few Great Captains: The Men and Events That Shaped the Development of U.S. Air Power* (Garden City, NY: Doubleday, 1980), 118.
[35] *Ibid*, 23.
[36] *Splendid Vision, Unswerving Purpose*, 22.
[37] Arnold, Global Mission, 76.
[38] Splendid Vision, Unswerving Purpose, 22.

instance in which UAVs, as opposed to piloted aircrafts, received military backing and financial support.[39] Experience gained with the Kettering Bug would also be important in coming years, once remote-controlled UAVs were developed.

Experiments with the Kettering Bug continued into the 1920s but ended because of a lack of funding. After World War I, Kettering returned to developing cars rather than planes. However, when America entered World War II, Kettering wanted to give his Bug another go.

Kettering Bug Part II

Throughout 1942, Charles Kettering struggled to get the USAAF to support the Kettering Bug. His motivation is unclear. Perhaps he wanted to have his invention receive the combat experience denied earlier. His communications with the USAAF suggest he had high-hopes for the Bug and believed it capable of being an effective weapon against the Germans. However, all of his supposed optimism should be tempered by the fact that he had become General Motors' head of research; production of the bug would mean the purchase of General Motors products. Another reason to discount Kettering's confidence was the numerous problems with the project.

Over twenty years had passed between the WWI Bug and the new attempt during WWII. The time lapse meant new technology would be used. The initial Bug's 40-horsepower engine was replaced by a new "8-cylinder 2-cycle 200 horsepower liquid cooled engine."[40] The improved capabilities increased the Bug's speed from 50mph to 200mph, and it could now carry 500, rather than 300, pounds of explosives.[41]

[39] "KETTERING AERIAL TORPEDO "BUG,"" National Museum of The US Air Force.

[40] *Mr. Kettering's "Flying Bug"*, Report to Gen. Arnold, April 16, 1942, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 128, 2.

[41] *Splendid Vision, Unswerving Purpose*, 22; *Mr. Kettering's "Flying Bug"*, 2.

Despite these improvements, plans for the Bug's implementation still relied on outdated targeting technology. The new prototypes were still using the World War I era targeting system. This meant the drone would fly a preset distance and then plunge to the ground and explode. Army-Air Force analysis showed this to be wildly inaccurate. If the weather were properly forecast, and the Bug only had to travel 50 miles, then it could strike within a half mile of the target. However, Army-Air Force projections said that in uncertain weather conditions, or when traveling longer distances, the Bug could end up landing up to 20 miles away from the target.[42]

Even at short distances, the Bug's preset data targeting was too inaccurate to fit into America's strategic bombing campaign in 1942. An April 16, 1942 USAAF analysis prepared at Commanding General Hap Arnold's request[43] rejects the idea of using Bugs to indiscriminately bomb the enemy, fearing it would increase their resistance. Arnold underlined the section of the report suggesting no Bugs be produced using the preset data targeting, further damning the program. However, Arnold was optimistic that the Bug could be implemented if the accuracy of its targeting improved.[44]

Ambitious new technologies were considered to improve the Bug's accuracy. Homing devices were under development. So were controls which used heat, light, sound, and radar transmissions. However, in mid-1942 when the Bug was being evaluated, these new targeting technologies were unfinished. Instead, it was decided that the Bugs, if implemented, would need to be radio controlled to be accurate. The Navy hoped to improve the Bug's accuracy by

[42] *Ibid*, 2-3.
[43] Gen. Arnold, *Mr. Kettering's "Flying Bug"*, Report Request from Gen, Arnold to Gen. Harmon, April 7, 1942, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 128, 1.
[44] *Mr. Kettering's "Flying Bug"*, 3.

installing television cameras to improve guidance. Arnold seemed favorable to radio controlled Bugs, adding a hand-written note that accuracy would be "very much" improved.[45]

There were other problems with the Kettering Bug. Special facilities and squadrons would need to be created for the Bug operators. Operators needed training to hone the skills required to operate the Bugs accurately. Control airplanes would be needed to carry operators as they remotely piloted the Bugs. The Bugs would require storage space, and their design was more cumbersome than the traditional ordinance it was essentially replicating. Ultimately, the fact that the Bug only carried 500 pounds of explosives with a limited range of 400 miles led the Army-Air Force to label it "inadequate."[46]

Kettering did not give up. In response to the critique of the Bug's size and limited capabilities, Kettering devised a "Double Bug." The Double Bug would be able to travel 1,000 miles and carry 2,000 pounds of explosives. However, even these capabilities were considered to be the bare minimum in order to "warrant the trouble and expense."[47]

Still undeterred, Kettering appealed directly to military brass. Beginning his letter with "My dear Colonel," Kettering promoted the Bug to Colonel Grandison Gardner, at the Air Force Proving Ground Command, Eglin Field, Florida. Kettering pointed out that the Bugs General Motors had produced fit the specifications requested by the Air Corps, specifications which had previously been "thought to be sufficient." Kettering termed the Bug an efficient weapon, saying it "uses no strategic material and consists of only the essential parts necessary to fly." However, the Bug was supposed to crash into its target and explode, meaning the sacrifice of a small plane, a TV camera, equipment for radio control, and a sophisticated new engine. Indeed, it was this

[45] *Ibid,* 3.
[46] *Ibid,* 4.
[47] *Ibid,* 4.

engine Kettering cared about the most. Kettering argued that "The only reason we were willing to undertake this job" was the utilization of the sophisticated motor General Motors had created. Its development had cost over 1,000 man hours and, without specifics, he claimed it had "characteristics never before obtained." Hoping an old acquaintance would be more receptive, Kettering asked Gardner to forward his pro-Bug letter to General Arnold.[48]

Gardner sent a harsh report about the Bug along with the forwarded letter. Gardner told Arnold that five experimental Bugs had been tested, though he only mentions the most recent as having "performed very well." Gardner pointed out that takeoff was still an issue for the Bugs.[49] They were launching them with a catapult.[50] The proposed use of television cameras to improve accuracy had not yet been proven effective. The Bug had not demonstrated that it could hit its target. Gardner seemed annoyed with Kettering, saying "Although those connected with the development of this weapon are highly optimistic as to the results they expect to obtain, it is felt that any decision to put it in production should be withheld pending the demonstration of its practicability."[51]

With General Motors behind the Bug, large-scale production was not an issue. However, the numerous problems raised during the testing process seem to have ended the efforts to use the Bug. Arnold conducted a meeting with Kettering and William Knudsen, also from General Motors, to discuss the Bug's strategic merit. The three men discussed several issues raised including "the availability of bases; of targets; the cost; production; comparison of production between the Bugs and heavy bombers; raw materials needed for the two types of weapons." The

[48] Charles F. Kettering, *Charles F. Kettering to Grandison Gardner, May 12, 1942*, Letter, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 5.

[49] Grandison Gardner, *Kettering Power Bomb*, Report, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 5.

[50] *Mr. Kettering's "Flying Bug"*, 2.

[51] Gardner, *Kettering Power Bomb*.

three agreed to terminate the project because even with several technological improvements, the Bug's short range only allowed it to hit occupied cities in France, Belgium, and Holland; not the desired target of interior Germany.[52] Despite the efforts of Charles Kettering, Hap Arnold, and others within the Air Corps, the Bug had failed to be combat-ready in both World Wars. Although the Kettering Bug failed, the experience gained influenced the development of the first military drone to actually be deployed in combat.

Operation Aphrodite

In late 1943, about a year and a half after the experiments with the updated Kettering Bug, General Arnold ordered Grandison Gardner, now a Brigadier General, to conduct a new UAV project.[53] Officially named Operation Aphrodite, the project produced the most significant UAVs yet developed. Overseen by Hap Arnold, the new drones had elements of the Kettering Bug and newer drones. Arnold's support of Operation Aphrodite stemmed from his continued fascination with developing new technologies for warfare. [54] Though both attempts with the Kettering Bug had failed, his autobiography reveals he desperately wanted to develop combat drones.[55] Arnold and Gardner's link to the Kettering Bug is significant because the new drones borrowed heavily from earlier drone projects.

During World War II, the USAAF repeatedly attempted to conserve aircraft resources. A major focus was placed on conserving aircraft through repairs before they would finally be

[52] Global Mission, 260-261.
[53] Dik A. Daso, Maj, *Architects of American Air Superiority: Gen. Hap Arnold and Dr. Theodore Von Karman* (Maxwell Air Force Base, Alabama: Air University Press, 1997), PDF, 72.
[54] Conrad C. Crane, *Bombs, Cities, and Civilians,*(Lawrence; University Press of Kansas, 1993), 78-79.
[55] Arnold, *Global Mission.* 76.

designated "War Weary," removed from tactical deployment, and replaced by functioning aircraft. Operation Aphrodite took the USAAF's conservation efforts one step further.[56]

The idea behind Operation Aphrodite was to use surplus, war-weary B-17 and B-24 planes, remove their weapons, armor, and interiors, and pack the planes with explosives. The use of these war-weary planes led to the explosive drones being nicknamed "Weary Willies."[57] This rather unprepossessing nickname was a reference to the popular tragic clown, Weary Willy, played by Emmett Kelly in the Ringling Brothers Circus.[58] Weary Willies functioned similarly to Japanese Kamikaze planes, crashing into their targets and exploding. However, Weary Willies did not require the sacrifice of human pilots. Weary Willies were not completely unmanned, requiring pilots to take off. However, the pilots then bailed out, and the planes could be remotely controlled into their targets.[59] During operations, Weary Willies were not controlled from the ground but from a plane that followed.[60]

It is unsurprising that Aphrodite's Weary Willies borrowed heavily from the Kettering Bug. Operationally speaking, the two drones were nearly identical; both were explosive-stuffed planes guided by radio control to their targets. However, Aphrodite avoided many of the problems which plagued the Kettering Bug. Aphrodite's use of elderly planes meant new planes were unnecessary. Aircraft storage space would be created. Aphrodite's recycled planes had

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[56] Colonel J. S. Fisher, *Supply and Maintenance: Procedure for Redesignation and Disposition of Aircraft as War Weary*, Memorandum 65-45, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 128; Brig. Gen. V. H. Strahm, *Supply and Maintenance: Aircraft Permanently Unfit for Tactical Use*, Memorandum 65-9, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 128; Colonel John S. Allard, *Supply and Maintenance: Designation, Identification, Marking and Disposal of Aircraft Permanently Unfit for Tactical Use*, Memorandum 65-21. From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 128.

[57] Daso, 72.

[58] "Emmett Kelly," Emmett Kelly, accessed April 01, 2013, http://www.ringling.com/ContentPage.aspx?id=45838.

[59] Daso, 72-73.

[60] Kenneth P. Werrell, *The Evolution of the Cruise Missile* (Maxwell Air Force Base, Ala.: Air University, Air University Press, 1985), PDF, 32.

sufficient operational range. Unlike the Bug, the 14,000[61]-18,500[62] pounds of explosives Weary Willies could carry was satisfactory.

Fig 3. Henry "Hap" Arnold[63]

Fig. 4 A Weary Willie drone taking off.[64]

Fig. 5 Joseph P. Kennedy Jr.[65]

Initially, the goal of Operation Aphrodite was to destroy German V-1 missile sites. Traditional American bombers had had little luck destroying these heavily-protected locations, considered "practically invulnerable to normal bombing attacks." The hope was that unmanned, bomb-stuffed planes would be able to crash into the missile sites, and destroy them without risking the lives of pilots.[66]

The Weary Willies did not live up to these high hopes. In combat, Weary Willies did not fare any better than piloted aircraft against the German defenses. The fact that Weary Willies were recycled, deteriorating aircraft that had been stripped of their armor contributed to their lack of success. Limited maneuverability through remote control lessened the chances for Weary

[61] Grandison Gardner, *Brig. Gen. Grandison Gardner to Gen. H. H. Arnold,* Letter, Eglin Field, Florida, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 5.

[62] Werrell, 32.

[63] *Gen. Henry H. Arnold,* National Museum of the US Air Force

[64] *Aphrodite-drone,* Wikipedia, Accessed March 1, 2013. http://en.wikipedia.org/wiki/File:Aphroditie-droneb17.jpg.

[65] *Joseph P. Kennedy Jr*., John F. Kennedy Presidential Library, Accessed March 1, 2013, http://www.jfklibrary.org/JFK/The-Kennedy-Family/Joseph-P-Kennedy-Jr.aspx.

[66] Crane, 78-79.

Willies to succeed. German anti-aircraft gunners were able to shoot down the drones before they reached their target destinations.[67]

Weary Willies also suffered from safety issues, one of which altered the course of American political history. By 1944 the U.S. Navy had developed an offshoot of Operation Aphrodite, Operation Anvil. The Navy felt that attaching television cameras and monitors to the Weary Willies would improve the aim of the operators using remote controls.[68] The pilot in the Navy's first use of Aphrodite drones was Joseph P. Kennedy Jr., the older brother of John F. Kennedy. Kennedy's role as a Weary Willie pilot has falsely been described as a "suicide mission."[69] While piloting an explosive-packed plane specifically designed to blow up was certainly risky, Kennedy was only supposed to get the plane off the ground and then bail out, once operators using remote controls in the accompanying mother plane had taken over. An unknown technical problem, perhaps related to malfunctioning circuitry, caused the premature detonation of the explosives in Kennedy's plane, killing him and his co-pilot Wilford Willy.[70] This deadly mishap would have caused second thoughts about Operation Aphrodite no matter who the pilot was. Because it was Joseph Kennedy Jr., fear of his politically-connected father's reaction "caused much consternation at many military headquarters."[71]

The final problem with Operation Aphrodite was that Weary Willies contradicted America's strategic bombing doctrine, to use precision bombing against military and industrial sites, and attempt to avoid civilian casualties. As the Weary Willies were used, it became

[67] Daso, 72.
[68] Crane, 80.
[69] Robert A. Caro, *The Passage of Power: The Years of Lyndon Johnson*, (New York; Knopf, 2012), 146.
[70] Martin O. Collins, dir., "Weird Weapons: The Allies," in *Modern Marvels*, History Channel, February 8, 2006.
[71] Crane, 80.

apparent that they "would fall on the Germans indiscriminately."[72] In October 1944, the United States Strategic Air Forces decided to use Weary Willies against German cities. [73] Arnold was very supportive of this idea.

Something had clearly shifted in Arnold's thinking. A report evaluating the Kettering Bug in 1942 attacked the idea of using it for indiscriminate bombing. The report states "there is considerable evidence to show that its (indiscriminate area bombing) results may be harmful from the stiffened moral resistance of the victims." Arnold even underlined the section of the report which said none of these inaccurate Kettering Bugs should be produced.[74] However, by November 1944, Arnold's interactions with Aphrodite suggest he was no longer concerned with the death of enemy civilians.

Allied losses by late 1944 were a major factor for Arnold's support of Aphrodite, something which was lacking when he dismissed the Kettering Bug. On November 23, 1944, Arnold wrote a letter to Lieutenant General Carl "Tooey" Spaatz, outlining his ideas for Weary Willy use. Though Weary Willies were primarily used against military targets, such as the V-1 missile sites, Arnold wanted to use them "as an irritant and possibly a means of breaking down the morale of the people of interior Germany." He approved of Britain's nighttime area bombings and wanted to emulate their actions. He specifically designated Cologne as a target, suggesting they simply launch the plane, have the pilot bail out, and let it fall anywhere within

[72] Crane, 78.
[73] Werrell, 34-35.
[74] *Mr. Kettering's "Flying Bug"*, 4.

the city limits. Arnold told Spaatz that he was ready to organize the logistics: pilots, crews, experts, and planes in order to carry out this assault on the German populace.[75]

Arnold seems bitter and vengeful for the terror Germany wreaked on Britain during The Blitz. Arnold wrote "My idea would be to turn them loose to land all over Germany so that the Germans would be just as much afraid of our war weary planes on account of not knowing just where they were going to hit, as are the people in England from the buzz bombs and rockets." Arnold said the unmanned-planes should simply be launched towards a German city. As the war-weary planes were shot down, and aircraft debris rained on the city, the indiscriminate danger meant "the psychological effect on the morale of the German people would be much greater." The strategic justification for this random assault was that the Germans would have to be constantly prepared. The ever-present need to shoot down incoming planes meant the Germans would have to commit fighter pilots and functioning aircrafts for defense. America would only sacrifice decrepit planes. Even if Arnold's plan would tie up German resources, it is disconcerting that he would consider a strategy essentially identical to that of the Nazis as acceptable. He does not voice any concern for German civilians in the letter.[76]

On January 1, 1945, one of the drones crashed into a residential area.[77] Operation Aphrodite was ended around a month later, after the Yalta Conference. Officials recognized that the program contradicted the official, often ignored, American strategy of attempting to avoid civilian casualties. The British also feared that Aphrodite would prompt the Germans to expand

[75] General H. H. Arnold, *General H. H. Arnold to Lieutenant General Carl "Tooey" Spaatz,* November 23, 1944, Letter, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989,* Microfilm, reel 128.
[76] *Ibid*.
[77] Werrell, 34-35.

their terror bombing.[78] Lt. General James Doolittle dismissed the operation, saying "this whole project is put together with baling wire, chicken guts, and ignorance."[79]

Hap Arnold's evaluation of Operation Aphrodite was more favorable. Arnold's first justification of the program combined economy and efficiency. Arnold saw that recycling the B-17 and B-24 planes would make space in crowded American Air fields. Reusing and destroying old planes would also guarantee that new and improved planes would be manufactured. Arnold insisted that non-precision bombing was acceptable as long as it caused damage to the enemy.[80] As late as February 6 1945, two days into Yalta, Arnold was still actively supporting Aphrodite. He sent orders to Gardner that equipment should be developed that would make Weary Willies completely unmanned by eliminating the need for the pilots who got the planes airborne before bailing out.[81]

Perhaps the most significant contribution Arnold made to the development of drones was the argument he made in support of Operation Aphrodite. Arnold asserted that one should "try and kill as many men and destroy as much property as you can. If you can get mechanical machines to do this, then you are saving lives at the outset."[82] Even today, performing combat missions without risking the lives of American servicemen remains one of the strongest justifications for the use of drones.

This is the obvious explanation for Arnold's persistent commitment to Operation Aphrodite. Arnold wanted to spare as many Americans as he could from the horrors of war. In

[78] Daso, 72.
[79] Crane, 78.
[80] Daso, 72-73.
[81] Gen. H. H. Arnold, *Gen. H. H. Arnold to Gen. Grandison Gardner, February 6, 1945*. Military Mail Log. From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*. Military Mail Card.
[82] Daso, 73.

1943 Arnold spent December in Italy. Despite his long military career, Arnold seems shaken by the things he witnessed. His journal entry for December 11, 1943, is filled with disturbing imagery. Entitled "Modern battle," he describes war-ravaged Naples. Arnold first emphasizes the mechanized nature of the war: "Modern battle – jeeps and mud, trucks and tanks, more mud, trucks and road jams… Villages and towns demolished, partly demolished. Destruction and devastation everywhere." He then turns to the devastation this mechanization wreaks on man:

> Hospitals, field and evacuation, ambulances, operating room, removing bomb and shell splinters from the soldier's head, pulling a mangled hand together, tying a body together after a shell fragment tore loose a hip and almost all of a buttock, wounds in the abdomen, holes in back and abdomen the size of a football, blood transfusions. . . Nurses doing their part, working overtime, smiling. . . A man with only half his innards dying, but still smiling and saying, "I'm all right."[83]

Arnold had been spared from combat. He attended West Point, served briefly in the Philippines, and then became one of America's first military pilots. His aeronautical expertise obliged him to spend WWI in Washington where his service was considered more valuable than in battle. [84] It is unlikely that his experience in Italy was the first time he witnessed the carnage caused by war, but considering his visceral experience, his enthusiasm for using drones rather than risking lives is understandable.

Operation Aphrodite and Weary Willies had little impact on the outcome of World War II. Despite this, it was still the first instance in which America deployed drones for combat purposes. Though Aphrodite failed, it elicited a philosophy of war from Hap Arnold similar to collateral damage, the questionable military doctrine employed for drone use in modern times.

[83] Arnold, General Henry Harley, *Account from December 11, 1943,* War Log, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989*, Microfilm, reel 3, 32.
[84] Arnold, Global Mission, 48.

The Radioplane

Also during World War II, Reginald Denny, a British immigrant, made another important contribution to America's development of drones. Denny had two passions, acting and aeronautics. In a career spanning from 1915-1966 he had 186 acting roles, and it was his pursuit of Hollywood success which brought him to America.[85] However, Denny had served as a British pilot during World War I and he also found success in American aeronautics. Though he was not a major player, Denny fed his aeronautical interests and capitalized on his fame by opening "Reginald Denny's Hobby Shop" to sell radio-controlled airplanes. [86]

His hobby shop continued to function as a retailer for RC airplane enthusiasts, but by 1935 Denny's business had expanded to include the "Radioplane" company.[87] Denny realized that his cheap RC planes could be used for target practice in training anti-aircraft gunners. In 1935 he successfully demonstrated his RP-1(Radioplane) prototype to the U.S. Army. Within four years he had produced four iterations of the Radioplane for military use. [88] Though some Radioplanes were purchased by the U.S. Army in the late '30s; America's entrance into World War II led to large orders, nearly 1,000 in 1943, from both the Army and Navy. Demand was so high that throughout the war other manufacturers were used to produce thousands of Denny's Radioplanes.[89] With his Radioplane, Denny had created the first UAV to be widely adopted by the American military.

[85] "Reginald Denny," IMDb, accessed February 9, 2014, http://www.imdb.com/name/ nm0219666/.
[86] Greg Goebel, "[1.0] Early US Target Drones," [1.0] Early US Target Drones, (February 1, 2012), Accessed March 01, 2013, http://www.vectorsite.net/twuav_01.html.
[87] *Ibid*.
[88] Greg Goebel, Early US Target Drones.
[89] "RADIOPLANE OQ-2A," National Museum of The US Air Force, February 4, 2011, Accessed March 1, 2013, http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=486.

Fig. 6 Denny's Hobby Shop in 1961[90]

Fig. 7 Denny in his workroom,[91]

Fig. 8 The Radioplane[92]

Launched from a catapult, the Radioplane was remotely controlled from the ground. If not destroyed during target practice it could deploy a parachute and be recovered.[93] The Radioplane had a simple two-cylinder, two-cycle engine with six horsepower. Despite its weak engine, its top speed was 85 miles per hour because the Radioplane was small and light.[94]

Denny's UAVS were target drones, rather than combat drones, such as the Kettering Bug or Weary Willies. Numerous different target drones would be produced throughout the 20th century and continue to be used today. Eventually, Denny's Radioplane Company was obsolete, thanks to more complex target drones produced by other manufacturers. In 1952 the defense technology company Northrop purchased the rights to the Radioplane.[95] Though he was no longer involved with the Radioplane, Denny's early target drone led to important advances in UAV technology during the Cold War.

During the World Wars, drones produced few tangible results on the battlefield. However, Arnold's extensive experience with drones and other new war technologies (long-

[90] Pete Soule, *Reginald Denny's Hobby Shop*, 1961, Hollywood, http://www.ctie.monash.edu.au/hargrave/dennyplane.html

[91] Jim Dunkin, *Reginald Denny in His Workroom*. Hollywood, http://www.ctie.monash.edu.au/hargrave/dennyplane.html.

[92] "RADIOPLANE OQ-2A," National Museum of The US Air Force.

[93] *Ibid.*

[94] "Radioplane OQ-2 Aerial Target Drone (1941)," Military Factory, January 20, 2014, section goes here, accessed February 9, 2014, http://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=331.

[95] *Ibid.*

range bombers and atomic bombs) had a significant impact on his thinking, contributing to his advocacy for a more intelligent and modern approach to warfare. Arnold would retire soon after the end of World War II, but he had dedicated his career to advancing the future of aviation. During both World Wars he helped push aeronautical innovation through UAV development. These experiences convinced him that drones would play a major role in American military aviation. In his V-J (Victory over Japan) day speech, Arnold sought to convince his fellow servicemen as well. Congratulating his listeners on their victory, Arnold said "We have just won a war with a lot of heroes flying around in planes." He then turned to the future and, likely reflecting on his experiences with UAVs, said "The next war may be fought with airplanes with no men in them at all. It certainly will be fought with planes so far superior to those we have now that there will be no basis for comparison." Arnold recognized the potential that drones would have for the future of warfare and took steps to help later drones to succeed.[96]

A significant and long-lasting contribution came in December 1945 when Arnold successfully lobbied the War Department and Congress to create Project RAND (Research and Development), an experimental "one year study on the future of warfare." Arnold explained to the War Department that it was necessary to bring in civilian scientists and researchers to help drive technological innovation for the military. He complained that previously there had not been enough collaboration toward innovation among the different branches of the military, governmental agencies, and industry. In his appeal for Project RAND, Arnold argued that "scientific planning must be years in advance of the actual research and development work." [97]

[96] Jay M. Shafritz, *Words on War: Military Quotations from Ancient times to the Present* (New York, NY: Prentice Hall, 1990), 104.

[97] Harry S. Laver and Jeffrey J. Matthews, *The Art of Command: Military Leadership from George Washington to Colin Powell* (Lexington, KY: University Press of Kentucky, 2008), 174.

Arnold also advocated for the future of drones in his official War Reports. Published along with those of Army General George C. Marshall and Fleet Admiral Ernest J. King, Arnold's contributions reflect a sense of hesitant optimism. The Army and Navy were long established branches of the military; the Air Force was not. Though air power had performed well during World War II, when the War Reports came out in 1947 it was still the subservient "Army Air Force." Within the year the Air Force would separate from the Army, but Arnold had spent his life serving a subservient military branch. He cautions against allowing America's military might to deteriorate, and echoing his experience with Project RAND, insists on the necessity for greater scientific research and development to produce more advanced aircraft. Notably, advanced pilotless planes are listed first in his "New Concepts" to be developed.[98]

Project RAND was renewed until 1948 when it became the independent RAND Corporation, to this day one of the most important military think tanks. Drones helped convince Arnold of the necessity of RAND; RAND helped convince the military of the potential of drones in years to come.[99]

[98] George C. Marshall, Ernest J. King, and H. H. Arnold, *The War Reports*(Philadelphia, PA: Lippincott, 1947), 462-466.

[99] "History and Mission," RAND Corporation, accessed May 15, 2014, http://www.rand.org/about/history.html.

CHAPTER TWO:
THE "INEVITABILITY" OF DRONES AND THE COLD WAR

The Cold War, along with the 1990s, was the most significant period for drone development. Driven by covert surveillance needs, there were numerous attempts to produce a viable drone, but with little success. The failures are often ignored by enthusiasts. Technological determinism--the unquestioning belief in the ability of new technologies to solve society's problems--has taken hold today. This can be seen in the misconception of the inevitability of drone adoption. Earlier unsuccessful models are overlooked, focusing on the birth of the successful Predator. The relative ignorance of this drone history creates a specious air of inevitability. New technologies are rarely questioned, especially if their record seems successful. In reality, during the Cold War, drones faced numerous obstacles, including technological limitations, expense, and competition from manned aerial surveillance (the U-2) and satellites. In addition, when the potential of UAVs finally emerged in the 1990s, the threat of foreign drones was quickly integrated into American military analysis.

The military currently sees increased drone use as the inevitable future of aerial warfare. In 2013, the air force predicted that, within a decade, a third of all its attack planes would be unmanned. More drone pilots are being trained than fighter and bomber pilots combined.[100] Drones have surpassed manned planes in flight hours.[101] Drones are being promoted so heavily that it is difficult to find enough pilots, though some problems are tied to poor promotion rates or negative comparisons to conventional pilots.[102] Military think tanks, such as the International

[100] *Rise of the Drones*, dir. Peter Yost (2013), television broadcast, accessed February 24, 2013, http://www.pbs.org/wgbh/nova/military/rise-of-the-drones.html.

[101] "Flight of the Drones," *The Economist*, October 08, 2011, accessed March 23, 2014, http://www.economist.com/node/21531433.

[102] Chris Carol, "Unmanned Now Undermanned: Air Force Struggles to Fill Pilot Slots for Drones," *Stars and Stripes*, August 25, 2013, accessed March 12, 2014, http://www.stripes.com/news/unmanned-now-undermanned-air-force-struggles-to-fill-pilot-slots-for-drones-1.236906.

Institute for Strategic Studies, fully support this drone expansion, recognizing that drones have proven themselves and are becoming cheaper.[103] Increased integration of drones seems likely now and for the twenty-first century.

Why Drones?

The surveillance needs of the Cold War were the primary motivation for drone development. In 1954 President Eisenhower first authorized reconnaissance missions using the U-2 spy plane. The plane was revolutionary at the time, capable of flying at 70,000 feet and up to 4,000 miles without refueling. The altitude was initially too high for Soviet anti-air defenses. Eisenhower limited his use of the U-2 during most of his administration, but in early 1960, seeking information on Soviet Intercontinental Ballistic Missiles (ICBM) development, he authorized more missions in Soviet airspace. This resulted in the 1960 Gary Francis Powers U-2 incident, in which the pilot was shot down. The Soviet Union recovered incriminating evidence: Powers alive, remnants of the plane, and the film. International scandal erupted after American denials of guilt and Soviet revelations, ruining a summit in Paris between the United States, Soviet Union, Britain, and France, as well as intensifying Cold War tensions.[104] Avoiding these dangers, both political and to pilots, was a major factor in greater American drone development.

The dangers of aerial surveillance were frequently revealed. During the Cuban Missile Crisis, two years after the Powers incident, Maj. Rudolph Anderson Jr.'s U-2 was shot down. No longer able to hide at 70,000 feet, U-2s faced a serious threat from anti-air defenses. Air Force leaders considered but rejected reconnaissance drone prototypes. Officials did not want to risk

[103] "Think Tank: Use of Drones Spreading as Cost Falls," *Defense News*, February 5, 2014, accessed February 12, 2014, http://www.defensenews.com/article/20140205/DEFREG03/302050019/Think-Tank-Use-Drones-Spreading-Cost-Falls.

[104] James R. Arnold and Roberta Wiener, *Cold War: The Essential Reference Guide* (Santa Barbara, CA: ABC-CLIO, 2012), 221-222, accessed May 5, 2014, EBook Collection (EBSCOhost).

revealing this new technological development to the Soviet Union.[105] Discussions in 1965 between Secretary of Defense Robert McNamara and Deputy Secretary of Defense Cyrus Vance led to a memo which recognized that "The use of U-2's over Communist China is becoming increasingly hazardous because of SAMS and MIG 21 attack techniques." McNamara and Vance would have preferred using drones to U-2s, but could not because of technical difficulties.[106] On April 18, 1968, a manned surveillance plane was shot down over North Korea, killing thirty-one Americans. President Nixon was criticized for sending airmen into such a hostile situation; drones were considered the answer.[107]

The drone solutions contemplated in Cuba, and implemented in Korea, were actually modified target drones, Reginald Denny's original concept. Operating out of San Diego California, Ryan Aeronautical manufactured target drones for weapons testing and training.[108] By 1962, the company had turned its Fire Bee target drone into the Fire Fly reconnaissance drone. Over time, Ryan Aeronautical would produce more than twenty variations of the Fire Bee. The Fire Fly was soon replaced with a more complex iteration, the Lightning Bug, the only drone success story of the Cold War.[109]

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[105] Thomas P. Ehrhard, *Air Force UAVs the Secret History* ([Arlington, Va]: Mitchell Institute Press, 2010), PDF, 7.

[106] United States of America, Central Intelligence Agency, *Memorandum for Record: Discussion with Secretary McNamara and Secretary Vance concerning Aerial Reconnaissance over Communist China*, by Robert McNamara and Cyrus Vance, U.S. Intelligence and China: Collection, Analysis, and Covert Action (March 18, 1965), accessed February 2, 2014, Digital National Security Archive.

[107] Ehrhard, *Air Force UAVs the Secret History*, 14.

[108] "Historical Overview," Ryan Aeronautical, accessed April 08, 2013, http://www. ryanaero.org/ history.html.

[109] Ehrhard, *Air Force UAVs the Secret History*, 6-8.

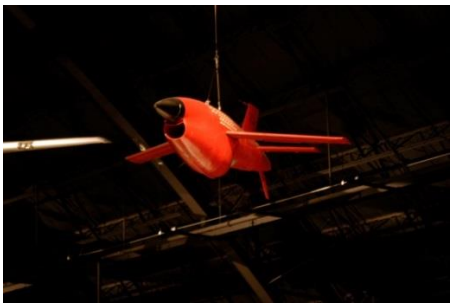

Fig. 9. An original Fire Bee drone[110]

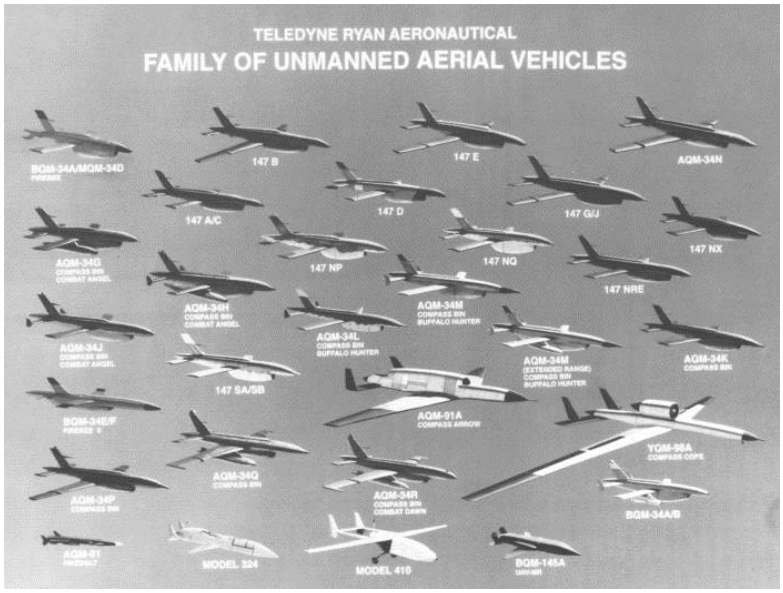

Fig. 10. UAVs made by Ryan Aeronautical.[111]

The Lightning Bug

The Lightening Bug reconnaissance drone was used extensively during the Vietnam War to monitor China, North Vietnam, and North Korea. It was capable of flying at high altitudes, similar to the U-2 spy plane, and was virtually untraceable by radar. These drones, which were both remotely-controlled and auto-piloted over their targets, took pictures and proceeded to predetermined locations where they would parachute for later recovery. In total, 3,435 Lightening Bug missions were flown throughout South East Asia between 1964 and 1975.[112]

The Lightning Bug's success was not typical of Cold War drones, but the obstacles it faced (technical limitations, competition from other surveillance technologies, and expense) were. The UAVs often veered off their preprogrammed courses, producing pictures of no

[110] *RYAN BQM-34 FIREBEE*, Cold War Gallery, National Museum of the U.S. Air Force, Dayton, Ohio. Accessed March 1, 2013. http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=3363.

[111] *Teledyne Ryan Aeronautical Family of Unmanned Aerial Vehicles*. Teledyne Ryan Aeronautical, Accessed March 1, 2013. http://www.designation-systems.net/dusrm/m-34.html.

[112] Greg Goebel, "[3.0] The Lightning Bug Reconnaissance Drones." [3.0] The Lightning Bug Reconnaissance Drones. (February 1, 2012), Accessed March 01, 2013. http://www.vectorsite.net/twuav_03.html.

strategic value. They were damaged when parachuting to the ground, resulting in the implementation of midair retrieval system (MARS). This solution not only made operations more complex but also less effective. Initially, forty percent of lightning bugs were lost due to midair recovery. The problems were resolved by 1972, when operations had a ninety-eight percent recovery rate.[113]

Though not specified in their report, the drones discussed by McNamara and Vance in 1965 were definitely Lightning Bugs. Despite the drone failure, aerial reconnaissance over China was still needed, and U-2s chosen for the task. Rather than drones, emphasis was put on further developing another manned reconnaissance technology, project OXCART.[114] OXCART was designed to be the successor to the U-2, capable of higher altitudes and flight speeds.[115]

In a study for the Air Force Association's Mitchell Institute, Thomas P. Ehrhard argues the Lightning Bug only succeeded thanks to the opportunity provided by the Vietnam War, including covert funding. The Air Force and CIA conducted joint drone research and development under a classified organization called the National Reconnaissance Office (NRO). Lightning Bug production alone cost $1.1 billion, equivalent to $5.8 billion in 2010 when Ehrhard wrote his study. Maintenance and operational costs greatly increased this figure, making the Lightning Bug the most expensive UAV of its time.[116]

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[113] Ehrhard, *Air Force UAVs the Secret History*, 26.

[114] United States of America, Central Intelligence Agency, *Memorandum for Record: Discussion with Secretary McNamara and Secretary Vance concerning Aerial Reconnaissance over Communist China*, by Robert McNamara and Cyrus Vance.

[115] Thomas P. McIninch, "The Oxcart Story," Central Intelligence Agency, August 04, 2011, accessed March 2, 2014, https://www.cia.gov/library/center-for-the-study-of-intelligence/kent-csi/vol15no1/html/v15i1a01p_0001.htm.

[116] Ehrhard, *Air Force UAVs the Secret History*, 2, 28.

Why not Drones.

Only the Lightning Bug managed to overcome these problems. Numerous other drones were developed during the Cold War but were unsuccessful. Arguably the most ill-conceived Cold War drone was the Lockheed D-21B, developed under the codename Tagboard. Test flights began in 1964 with operations lasting until the program was canceled in 1971. Tagboard was designed to conduct deep penetrating reconnaissance missions in hostile airspace.[117] It could reach an altitude of 95,000 feet and fly at a top speed of Mach 4, over 2,500 miles per hour.[118] Tagboard's primary target was the Chinese nuclear facility at Lop Nor, a remote salt lake in Northwestern China. Since Lightning Bug drones were not feasible for reconnaissance at Lop Nor, Tagboard's importance grew as the Chinese conducted nuclear weapons tests during the mid to late 1960s.[119]

There were major conceptual flaws with the Tagboard drones. Initially, the drones would be "piggybacked" by an M-12 plane and launched before reaching dangerous airspace. The first few launches were successful. During a flight on July 30, 1966, the drone collided with the manned carrier; both aircrafts were destroyed and a crew member was killed. No more piggyback missions were attempted. The carrying plane became the larger, more capable, B-52, which could carry it like a bomb.[120] These drones were also sacrificial. They would fly over the target, photograph it, and return to a recovery zone. At the recovery zone, the film, camera,

[117] "Factsheets : Lockheed D-21B," National Museum of the U.S. Air Force, October 22, 2013, accessed February 23, 2014, http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=396.

[118] "LOCKHEED GTD-21 TAGBOARD DRONE," Grissom Air Museum, accessed April 15, 2014, http://www.grissomairmuseum.com/gallery/drones/plane-27.

[119] Ehrhard, *Air Force UAVs the Secret History*, 9.

[120] "Factsheets : Lockheed D-21B," National Museum of the U.S. Air Force.

guiding system, and avionics would be ejected, but the drone itself would self-destruct.[121] Willfully wasting these highly complex drones was not cost-effective.

Fig. 11. The Tagboard drone alone, carried by an M-12, and two carried by a B-52.[122]

An NRO document from March 20, 1970, detailed thirteen different Tagboard test flights; they oft experienced technical difficulties. On November 6, 1967, the drone failed to sustain its proper cruise flight; poor engine performance was suspected. On December 2, 1967, "Flight," was "terminated prematurely after failure of the hydraulic system and subsequent loss of control." Flight was "terminated prematurely" again on January 19, 1968. A flight on April 30, 1968, had a successful launch and boost but "was unable to sustain cruise and lost altitude and speed due to low thrust from the engine." The drone was destroyed. Only a few of the thirteen test flights succeeded.[123]

[121] Ehrhard, *Air Force UAVs the Secret History*,9-10. Ehrhard says the project codename was changed to "Senior Bowl" when the carrying aircraft was changed in 1966 but I have documents from 1970 still referring to the program as Tagboard.

[122] *Lockheed D-21B*, National Museum of the U.S. Air Force, Dayton, Ohio, accessed February 13, 2014, http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=396; *D-21*, Wikipedia, accessed March 3, 2014, http://en.wikipedia.org/wiki/Lockheed_D-21#cite_ref-Donald_p154-6_1-0; *B-52 with Two D-21s*, Wikipedia, accessed March 4, 2014, http://en.wikipedia.org/wiki/Lockheed_D-21#cite_ref-Donald_p154-6_1-0.

[123] United States of America, National Reconnaissance Office, Office of the Director, *Tagboard Missions*, U.S. Intelligence and China: Collection, Analysis, and Covert Action (March 20, 1970), accessed March 5, 2014, Digital National Security Archive.

On December 17, 1970, a Tagboard reconnaissance mission over South China failed. The drone successfully launched and flew its preprogrammed route. The "recovery package" with the film was ejected at the correct location and on time. Recovery failed when the package descended far too rapidly and crashed into the water. Searches followed, but the recovery package appeared to have broken and sunk.[124]

A February 26, 1971, teleconference between then Secretary of State William Rogers and National Security Advisor Henry Kissinger reveals the attitude of high level officials towards Tagboard. President Nixon wanted to conduct a reconnaissance operation over China with drones. Rogers had previously questioned the wisdom of using drones there, but subsequent events changed his mind. He still noted that there was concern whether they would even work. Kissinger remarked that "It was a flap both times." With Rogers' support, and opinion united, Kissinger resolved to take the drone operation to the President.[125]

The last two of four Tagboard missions directed at the Lop Nor facility were conducted in March 1971. They failed, just like the first two attempts. In the end, the drone provided no reconnaissance intelligence on the Chinese nuclear facility.[126] Supposedly, Tagboard had a handful of other successful reconnaissance missions, but details remain classified. The program was canceled in 1971, the remaining drones put in storage.[127]

More than technical problems plagued Tagboard. A 1965 document, which amounts to a to-do list, includes part requisitions, development projections, and organizational goals. The

[124] United States of America, Department of Defense, *Tagboard Mission Resume*, U.S. Intelligence and China: Collection, Analysis, and Covert Action (December 17, 1970), accessed March 2, 2014, Digital National Security Archive.

[125] Henry Kissinger and William Rogers. "*U.S. Flights over China."* Memorandum of Telephone Conversation. U.S. Intelligence and China: Collection, Analysis, and Covert Action. Digital National Security Archive.

[126] Ehrhard, *Air Force UAVs the Secret History*, 10.

[127] "Factsheets : Lockheed D-21B," National Museum of the U.S. Air Force.

document reveals the divided attention among multiple aerial surveillance projects, as well as efforts placed on conserving resources. The needs of four different aerial reconnaissance projects are discussed including: Tagboard, Dragon Lady (the codename for U-2 spy planes), SR-71 Blackbird, and Oxcart (the Lockheed A-12-- the proposed U-2 replacement). All were trying for high altitude reconnaissance, but Tagboard was the only drone mentioned. Great attention was put into trying to consolidate the needs of the different projects. Conservation efforts included identifying "which Oxcart sensors… can be used in the SR-71 program" and determining "the number of Y-J engines, if any, which the SR-71 program would want to acquire from the Oxcart program." A shopping list of spare Oxcart parts was to be prepared to supply the SR-71 program, Tagboard, and Dragon Lady. These actions were prudent, but nonetheless reveal the concern over the cost of these programs and the need to conserve resources.[128]

According to Ehrhard, Tagboard began with a budget of $31 million and costs increased tenfold over the project's history. He details numerous other Cold War drone projects including: Compass Rose, the Advanced Airborne Reconnaissance System (AARS), the Elevated target acquisition system (ELTAS), other Fire Bee variants, Condor, and more. They accomplished little, but revealed the same problems: technical limitations, expense, and competition from other aerial reconnaissance technologies. In 1974, the NRO dropped all of its drone projects in favor of focusing on satellite reconnaissance.[129]

[128] United States of America, United Stated Air Force, *Scope Cotton Actions*, U.S. Espionage and Intelligence (1965), accessed February 8, 2014, Digital National Security Archive.
[129] Ehrhard, *Air Force UAVs the Secret History*, 10, 19.

Rise of the Predator

Other than the Lightning Bug, only one other significant drone emerged from the Cold War though it did not prove itself until the 1990s.[130] In the late 1970s, the Defense Advanced Research Projects Agency (DARPA) began the Teal Rain program focused on the "research, development, test and evaluation of experimental long endurance vehicles."[132] Aeronautical engineer Abe Karem led a development team in the creation of a UAV prototype. He based its design around the anatomy of an albatross, and named it after the bird. Karem criticized the designs of other drones for copying manned aircraft and thus not being as aeronautically efficient as possible. The albatross' long wingspan was the primary inspiration, allowing more efficient and longer flights.[133] Looking to nature for technical innovation continues today: the military is currently funding the study of dragonflies for possible drone applications.[134] After a successful demonstration in which an Albatross prototype stayed in flight for fifty-six hours, Karem's company, Leading Systems, received funding from DARPA. [135] The primary strategic advantage of Karem's prototype was its long flight times, which enabled it to "loiter" over targets when conducting reconnaissance missions.[136] The military's choice to use the word loiter is interesting; it suggests the machines are up to no good. Karem and Leading Systems developed two more

[130] The Navy's Pioneer UAV was also developed during the Cold War. It was primarily used to aid in naval bombardment targeting. However, it was not nearly as important as Predator has proven to be. Pioneer's main claim to fame came during the first Iraq war when Iraqi troops attempted to surrender to it, fearing they would soon be hit by more shelling from the gunships.[32]

[131] "RQ-2A Pioneer Unmanned Aerial Vehicle (UAV)," The US Navy, September 9, 2013, accessed March 15, 2014, http://www.navy.mil/navydata/fact_display.asp?cid=1100&tid=2100&ct=1.

[132] United States of America, Defense Advanced Research Projects Agency, *Security Classification Guide for Teal Rain Program*, U.S. Espionage and Intelligence (March 6, 1979), accessed February 26, 2014, Digital National Security Archive.

[133] Abe Karem in *Rise of the Drones*, Directed by Peter Yost.

[134] Natalie Angier, "BASICS; Dragonflies, Nature's Deadly Drone, but Prettier," The New York Times, April 02, 2013, accessed April 02, 2013, http://www.nytimes.com/2013/04/02/science/ dragonflies-natures-deadly-drone-but-prettier.html?pagewanted=1.

[135] "The Dronefather," The Economist, December 01, 2012, accessed January 26, 2014, http://www.economist.com/news/technology-quarterly/21567205-abe-karem-created-robotic-plane-transformed-way-modern-warfare.

[136] UAV Pilot Chad, Quoted in *Rise of the Drones*, dir. Peter Yost.

iterations, the Amber and Gnat 750, but financial problems led Karem to sell his designs to defense contractor General Atomics, which eventually developed the drone into the most significant yet, the Predator and Reaper.[137]

Fig. 12. Abe Karem and the Albatross prototype.[138]

Fig. 13. The modern Predator drone.[139]

Though Karem conceived of the drone in the late 1970s, the Predator did not prove itself until the Bosnian conflict in the mid-nineties. By this time, UAV development was consolidated and managed by the Defense Airborne Reconnaissance Program (DARP), part of the larger Defense Airborne Reconnaissance Office. DARO published a UAV annual report for fiscal year 1996, including events from 1995. The report praised Predator's accomplishments. UAV

[137] Peter Finn, "Rise of the Drone: From Calif. Garage to Multibillion-dollar Defense Industry," Washington Post, December 24, 2011, accessed March 12, 2014, http://www.washingtonpost.com/national/national-security/rise-of-the-drone-from-calif-garage-to-multibillion-dollar-defense-industry/2011/12/22/gIQACG8UEP_story.html.

[138] *Karem Drone*, accessed March 30, 2014, http://geographicalimaginations.com/tag/fred-kaplan/.

[139] Chad Slattery, *Predator Drone*, Electronic Warfare & Reconnaissance Aircraft, CHECK 6 Aviation Photography Stock Agency, accessed April 03, 2013, http://www.check-6.com/gallery/electronic/Predator-Drone-by-Chad-Slattery.php.

operations in Bosnia were the year's main "success story" and Predator had been the most active of the various UAVs discussed.[140]

In fiscal year 1996, Predator flew over 530 missions for over 2,500 flight hours; 159 of the missions and 1,169 of the hours were over Bosnia. The drone's video streams sent the long-sought "common picture of the battlefield" to receiving sites in-theater and in the US. The DARO report claimed that Predator use "helped determine the course of the Bosnian conflict." Predator's ability to loiter in the air and provide long term surveillance revealed Serbian weapons movement as well as confirming that there had been no effort at withdrawal. The DARO report says this Predator-provided intelligence was the key to convincing NATO commanders to resume the bombing campaign, which led to the Dayton peace accord in December 1995.[141] Congressional review of the Department of Defense's drone use also mentions Predator contributions to maintaining the cease-fire in Bosnia including "detecting troop movements in unauthorized areas, discovering previously unknown weapons factories or depots, and locating units that were breaking the peace."[142] The military now had a drone with potential.

Predator's successes went beyond Bosnia. In 1995 and 1996, it was the first UAV to utilize both SAR (Synthetic Aperture Radar) and advanced satellite links.[143] Predators were also tested in naval exercises. A Predator demonstration involved a drone being controlled by a

[140] United States of America, Defense Airborne Reconnaissance Office, *UAV Annual Report, FY 1996*, U.S. Espionage and Intelligence (November 6, 1996), accessed February 14, 2014, Digital National Security Archive, 7.

[141] United States of America, Defense Airborne Reconnaissance Office, *UAV Annual Report, FY 1996*, 1, 7-8.

[142] United States of America, Congressional Budget Office, *Options for Enhancing the Department of Defense's Unmanned Aerial Vehicle Programs*, Terrorism and U.S. Policy, 1968-2002 (September 1998), accessed February 25, 2014, Digital National Security Archive, 4.

[143] Specifically, Predator was the first to use Ku Band satellite links, also used by NASA.

submerged Submarine; the drone transmitted its video stream back to the underwater vessel. Another test included a Predator supporting a carrier battle group.[144]

Despite these accomplishments, Predator still faced the same obstacles as the drones that preceded it. Predator's full, weaponized potential wasn't revealed until 2001 when it first fired a Hellfire missile.[145] In the 1990s, DARO's UAV vision was limited; a report has their presumptive slogan "Supporting the Warfighter" on every page.[146] Restricting UAV development solely to support roles made Predator secondary to other UAVs. In the same 1996 DARO UAV report which praised Predator's accomplishments in Bosnia and its various new feats, "program prioritization" was placed on other projects. "The number one priority for UAVs remains the tactical UAVs (Outrider and Pioneer)." Predator came second to the drones which provided immediate tactical aid to battlefield forces.[147] This nonetheless demonstrates progress for drone adoption. Cold War drones had been outdone by manned reconnaissance planes and satellites. Finally, viable drone choices existed.

Predator also faced technical issues. Initially, the UAV had operational limitations based on weather. During missions the drone's wings would ice up, though a remedy was quickly found. After the Bosnian missions, technical improvements were needed including "an all-weather sensor" and the need for "all-weather flight capability." The communication links also needed development, to enable conversations between drone pilots and air traffic control, as well

[144] United States of America, Defense Airborne Reconnaissance Office, *UAV Annual Report, FY 1996*, 1.

[145] "Factsheets : General Atomics Aeronautical Systems RQ-1 Predator," National Museum of the U.S. Air Force, September 15, 2010, accessed February 17, 2014, http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=344.

[146] United States of America, Defense Airborne Reconnaissance Office, *NMIA Defense Intelligence Status '96*, U.S. Espionage and Intelligence (November 19, 1996), accessed February 9, 2014, Digital National Security Archive.

[147] United States of America, Defense Airborne Reconnaissance Office, *UAV Annual Report, FY 1996*, 1.

as better utilization of the video streams provided by Predators. These issues were overcome, though problems still remain.[148]

Predator adoption was not inevitable; it took over two decades for its potential to be recognized. Like the Lightning Bug, the Predator faced the same problems as other drones. These drones' successes, however, were brought on because they proved their capabilities at opportune moments: Vietnam for the Lightning Bug, Bosnia and especially the War on Terror for the Predator. Besides greater adoption, the Predator's demonstration of UAV potential had an even wider effect on American foreign policy and military analysis.

Foreign Drone Proliferation

American recognition of UAV potential in the mid-1990s coincided with concern over international drone proliferation. Previously, foreign interest in drones had been recognized. America supplied Israel's drone needs. In a July 27, 1970, conversation, during the Egyptian-Israeli War of Attrition, then Ambassador Yitzhak Rabin complained to Kissinger about Egyptian and Soviet interception of Israeli Skyhawk planes. A reconnaissance drone shipment had just been delivered, for operations too dangerous for manned planes. The type of drones were not specified, but, based on the year, they were most likely Lightning Bugs.[149]

Chinese interest in drones was not welcome. In 1976, China wanted to purchase twenty Fire Bee drones, the base target drone from which the Lightning Bug was modified, from Teledyne-Ryan Aeronautical Company.[150] Ryan Aeronautical had been sold to Teledyne in

[148] *Ibid*, 7.

[149] United States of America, *Delivery of Drone Aircraft to Israel*, by Yitzhak Rabin and Henry Kissinger, Kissinger Telephone Conversations (July 27, 1970), accessed February 3, 2014, Digital National Security Archive.

[150] United States of America, Department of State, Bureau of East Asian and Pacific Affairs, *China Policy, Firebee Drones for the ROC*, Kissinger Transcripts (July 12, 1976), accessed February 18, 2014, Digital National Security Archive.

1969.[151] On July 12, 1976, the prospect of selling drones to China was debated in a State Department meeting with Secretary Kissinger, Under Secretary Philip C. Habib, and other advisors. The primary concern was that China would modify the simple Fire Bee target drone to something more advanced, as America had done. The conversation, however, shows the disparaging attitudes towards drones at the time:

> Kissinger: We have to draw the line somewhere, though drones don't really bother me.
>
> (East Asian expert) William H. Gleysteen Jr.: They're a waste of money.
>
> Under Secretary Habib: It's their money.

Politics, not the fear of Chinese drone development, was the deciding factor. Kissinger wanted to delay until after the Republican National Convention. Habib noted Teledyne's persistence, saying "they'll be up on the Hill." He had already received calls from the congressman who represented the factory's district. Ultimately, Kissinger did not want to have Chinese pursuit of American military technology as an issue for the next six weeks and decided to "spin it out" with Teledyne.[152]

This early concern was minimal. If America, the superpower, could not create viable drones, there was little concern as to what other nations might make. The shift came in the 1990s once drones had actually proven themselves. In 1996, DARO noted the rapid international proliferation of drones over the previous decade. In 1986, there were eighteen nations with UAV programs. By 1991, thirty-three nations were working on drones; fifty nations had them by 1996.

[151] "Historical Overview," Ryan Aeronautical.

[152] United States of America, Department of State, Bureau of East Asian and Pacific Affairs, *China Policy, Firebee Drones for the ROC.*

DARO's objective was for America to stay ahead and have domestic UAVs to set the world standard.[153] It was recognized, however, that "Adversaries have UAVs."[154]

Though not directly stated, one of these adversaries was China. In 1997 the Secretary of Defense submitted a report to Congress detailing China's efforts to modernize its military. The report argued that "China's long-term goal is to become one of the world's great powers." UAV development was one, among many, pieces of evidence used to show China's progress. The report singled out specific drones, "particularly those with extended ranges or loitering times." These were the capabilities which Predator had recently proven to be of value.[155] The report was taken seriously. Congressman Floyd D. Spence, Chairman of the House National Security Committee, issued a press release equating the report to "the clearest official acknowledgment to date that China views the United States as the greatest obstacle to its ambition to become a great power and that China is developing the military capabilities needed to achieve its goal."[156] Chinese drones were mentioned in the next year's analysis as well. Drones with "potential strike capabilities" were the new threat.[157]

Similarly, concern over foreign weaponized drones seems to have emerged once America had proven this capability. Predator drones were first made lethal during a February 2001

[153] United States of America, Defense Airborne Reconnaissance Office, *UAV Annual Report, FY 1996*, 6.

[154] United States of America, Defense Airborne Reconnaissance Office, *NMIA Defense Intelligence Status '96.*

[155] United States of America, Department of Defense, *Report to Congress Pursuant to Section 1305 of the FY97 National Defense Authorization Act*, China and the U.S. (April 2, 1997), accessed February 14, 2014, Digital National Security Archive, 6.

[156] United States of America, House National Security Committee, *China: U.S. Obstacle to Superpower Status*, by Floyd D. Spence, China and the U.S. (April 8, 1997), accessed February 17, 2014, Digital National Security Archive.

[157] United States of America, Department of Defense, *Report to Congress Pursuant to Section 1226 of the FY98 National Defense Authorization Act*, China and the U.S. (January 1998), accessed February 11, 2014, Digital National Security Archive, 12.

weapons test in which the drone fired a laser guided hellfire missile at a stationary target.[158] Former CIA operative Henry A. Crumpton suggests that this deadly turn was prompted by a significant missed opportunity. In the late 1990s unarmed Predators had spotted Osama Bin Laden during a surveillance mission but lacked the ordnance to execute him themselves. An attack from another source would have taken too long.[159]

By the end of 2001, the American military focused on UAVs from other nations which had the same potential. In December 2001, the National Air Intelligence Center produced classified reports analyzing foreign drone development. One was a datasheet on general UAV developments; it noted that "Operational weaponized UAVs are starting to proliferate" and that "a few countries have attempted to convert manned aircraft to unmanned weapon delivery vehicles." The majority of the report was spent detailing the capabilities of over one-hundred foreign drones. Most of the details were redacted.[160] A second report dealt specifically with weaponized foreign drones which were considered "one of the most versatile weapon systems available to foreign battlefield commanders of today." The report argued that "weaponized UAVs pose an immediate airborne threat because of development and production activities in high-interest countries." America had developed lethal drones; now it worried about others.[161]

Drones struggled to succeed during the Cold War. As with the Kettering Bug and Operation Aphrodite, when drone programs faced overwhelming problems, whether from

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[158] "Factsheets : General Atomics Aeronautical Systems RQ-1 Predator," National Museum of the U.S. Air Force.

[159] Henry A. Crumpton, *The Art of Intelligence: Lessons from a Life in the CIA's Clandestine Service* (New York: Penguin Press, 2012), 154-155.

[160] United States of America, National Air Intelligence Center, *Unmanned Aerial Vehicle System Datasheets*, Weapons of Mass Destruction (December 2001), accessed February 11, 2014, Digital National Security Archive.

[161] United States of America, National Air Intelligence Center, *Foreign Weaponized Unmanned Aerial Vehicles*, Weapons of Mass Destruction (December 2001), accessed February 9, 2014, Digital National Security Archive.

expense, technical limitations, or superior competing technology, they were recognized and misguided efforts were suspended. This should not be seen as a failure but as the military recognizing its own limitations and accepting them, a relevant lesson for today.

CHAPTER THREE:
AMERICAN COUNTERINSURGENCY: THE PHOENIX PROGRAM IN VIETNAM AND CONTEMPORARY DRONE POLICY

The development of technologically-advanced UAVS has led to an expansion of their use, much of it controversial. The most contentious use of drones has been their integration into counterinsurgency efforts, serving as assassination tools against militants, often outside of official warzones, in places such as Yemen, Somalia, and, most frequently, Pakistan. Recent Drone policy has been much-criticized. Just as UAVs are not new; the flawed policies which govern their contemporary use are not new either.

The Vietnam War suggests an important parallel-- The Phoenix Program. This was a counterinsurgency initiative to neutralize an American enemy, the Viet-Cong-Infrastructure (VCI.) The historical parallels between these two programs are numerous, both suggesting conceptual flaws. Phoenix's relevance to contemporary counterinsurgency efforts with drones goes beyond historical parallels. David Kilcullen, a distinguished counterinsurgency advisor, criticizes America's drone use in Pakistan, advocating traditional counterinsurgency as the solution.[162] He feels the solution to the spread of militant Islam is a "Global Phoenix Program."[163] Kilcullen is not the only one who clings to the memory of Phoenix as a successful operation. Alfred McCoy discusses Phoenix's influence on the CIA and high level officials such as Donald Rumsfeld during the War on Terror.[164] Others in the military recognize the flaws in traditional counterinsurgency, viewing drones as the solution. The Strategic Studies Institute and U.S. Army War College published a study on drone effectiveness by political scientist James

[162] David Kilcullen and Andrew Mcdonald Exum, "Death From Above, Outrage Down Below," The New York Times, May 16, 2009, accessed March 15, 2014, http://www.nytimes.com/2009/05/17/opinion/17exum.html?pagewanted=all&_r=0&gwh=C861FFD7293B018BA4797DFE3DCBBAA0&gwt=pay.

[163] David Kilcullen, *Countering Global Insurgency*, report (November 30, 2004), 40.

[164] Alfred W. McCoy, *Torture and Impunity: The U.S. Doctrine of Coercive Interrogation* (Madison, WI: University of Wisconsin Press, 2012), 113.

Walsh. He advocates drones as the solution to the issues of counterinsurgency: avoiding American loss of life, improved intelligence gathering, and improved precision when using deadly force.[165] In reality, an examination of Phoenix not only reveals it to be a poor program, but that contemporary drone use suffers from many of the same problems. Both lacked adequate military intelligence resulting in few strategically significant accomplishments. Such counterinsurgencies, waged amongst the populace, caused excessive civilian casualties. Local hearts and minds turned against American action. The covert nature of these programs also led to corruption. Media revelations produced local public outrage, further turning the populace against the overall military operation. These problems not only demonstrate misguided policy but suggest the difficulties in such programs.

What is a successful counterinsurgency? Simply put, it is an attritional effort which grinds down the opposing insurgency, while enabling the local populace to execute its own security needs. The assumption is that the insurgency's limited resources will bring the greater power success. Winning the hearts and minds of the populace is also an essential goal. The occupation and security force provided by the occupying power cannot last forever; the local population must be prepared, eventually, to protect and govern itself. There is a great deal of justified cynicism concerning America's invasions, often likening them to neo-colonialism. In Vietnam, America ostensibly tried to stop the spread of communism by creating a puppet state. Recent American action in the Middle East is frequently dismissed as an effort to control oil. Were it possible to have a successful counterinsurgency it would be an inherently anti-colonial

[165] James Igoe Walsh, *The Effectiveness of Drone Strikes in Counterinsurgency and Counterterrorism Campaigns*, report (U.S. Army War College, Strategic Studies Institute, 2013), 2.

effort, first expelling troublemakers, then preparing the locals to handle their own security.[166] American counterinsurgencies in Vietnam and the Middle East failed to accomplish these goals.

As is common with the Vietnam War, the legacy of the Phoenix program is heavily debated, with competing interpretations on virtually every aspect. Phoenix was a counterinsurgency effort carried out by the CIA, American military, and South Vietnamese military which targeted the VCI, a group composed of civilians who provided political support to the military efforts of the Viet Cong. Phoenix began as a hodgepodge of American efforts, later organized into ICEX (Intelligence Coordination and Exploitation Program) in 1967. Later that year ICEX was renamed Phoenix, or Phung Hoang in Vietnamese, with CIA and American military funding and oversight of the largely Vietnamese effort. It was one of many programs within the overall Pacification effort, to strengthen the South and weaken the North. Pacification's support for the South ranged from economic and social reform to traditional military support against the Communist North.[167]

The stated goal of the Phoenix program was to "eliminate" or "neutralize" the VCI. Eliminate was changed to neutralize, because of public outrage in America.[168] Neutralization came about when a member of the VCI had been captured, rallied, or killed. The ideal situation for Phoenix operations was to capture someone in the VCI and convert them to supporting the American effort. Committed members of the VCI who would not cooperate were often coerced through torture to provide information. According to official Government of Vietnam (GVN)

[166] Vietnam and the War on Terror are the inherently anti-colonial counterinsurgencies to which I am referring. These occupational conflicts were paternalistic but used anti-colonial rhetoric. However, a counterinsurgency could be a precursor to a permanent occupation from the invading power.

[167] Richard A. Hunt, *Pacification: The American Struggle for Vietnam's Hearts and Minds* (Boulder: Westview Press, 1995), 2.

[168] House, Subcommittee of the Committee on Government Operations, *U.S. Assistance Programs in Vietnam, Hearings*, by Richard S. Winslow, 92nd Cong., 1st sess., H. Doc. (Washington DC, July 21, 1971), 244, accessed February 12, 2014, http://homepage.ntlworld.com/jksonc/docs/phoenix-hcgo-19710721.html#rsw.

numbers, Phoenix "neutralizations" resulted in 40,994 deaths.[169] The differing interpretations of Phoenix largely stem from which aspect of the program is emphasized and how much is acknowledged. Phoenix defenders, such as Guenter Lewy, or its director, William Colby, emphasize the positives (intelligence-gathering efforts); critics such as Douglas Valentine and Alfred McCoy, emphasize deaths and torture. The flaws in counterinsurgency efforts that arose during Phoenix have been carefully documented.[170]

There are contemporary parallels. Recent drone policy has utilized combat UAVs in Afghanistan, Iraq, Somalia, and Yemen, but this study focuses on their use in Pakistan. North Waziristan, on the border with Afghanistan, has been the primary target for American drone strikes outside of official warzones. At the time of writing, The Bureau of Investigative Journalism has counted 383 drone strikes in Pakistan between 2004 and 2014. This dwarfs the some seventy confirmed drone strikes in Yemen, or up to 8 in Somalia.[171] The Obama administration has been primarily responsible for America's drone war, which peaked in 2010, when 122 drone strikes were launched in Pakistan.[172] The primary goal of these drone operations has been the targeted killing of terrorists.

A comparison of Phoenix with contemporary drone use reveals the self-defeating problems of counterinsurgency. The obstacles can be divided into three broad categories:

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[169] Alfred W. McCoy, *Torture and Impunity.*

[170] For information on Phoenix see Douglas Valentine, *The Phoenix Program* (New York: Morrow, 1990); or Mark Moyar, *Phoenix and the Birds of Prey: The CIA's Secret Campaign to Destroy the Viet Cong* (Annapolis, MD: Naval Institute Press, 1997). Guenter Lewy, *America in Vietnam* (New York: Oxford University Press, 1978). has a chapter on Phoenix. Alfred W. McCoy, *Torture and Impunity: The U.S. Doctrine of Coercive Interrogation* (Madison, WI: University of Wisconsin Press, 2012). also has a chapter on Phoenix, dealing specifically with its use of torture.

[171] "Get the Data: Drone Wars," The Bureau of Investigative Journalism, accessed January 22, 2014, http://www.thebureauinvestigates.com/category/projects/drones/drones-graphs/. Exact data on the number of drone strikes and those killed is imprecise and typically presented as a range.

[172] "Drone Wars Pakistan: Analysis," The New America Foundation, accessed February 29, 2014, http://natsec.newamerica.net/drones/pakistan/analysis.

inefficiency, civilian casualties, and corruption. These mistakes often feed into each other, weakening the overall effectiveness of the programs.

1. Inefficiency: Inadequate Intelligence, Imprecision, and Low-Level Deaths

Inefficiency plagued the Phoenix program and contemporary drone use. A lack of intelligence about the enemy contributed to imprecision, resulting in low-level or innocent people being harmed.

A. Intelligence Inadequacy

The first major reason for inefficient drone policy has been a lack of military intelligence. This is ironic-- Abe Karem's Predator prototypes were designed for surveillance and intelligence-gathering. While drones have provided valuable Intel, both in and out of combat, their lethal uses have often been misguided.

America's disinclination to commit troops to military efforts in Pakistan is the primary reason for the lack of intelligence. Our campaign to date has relied mostly on UAVs to target and kill insurgents. After years of unpopular war in Iraq and Afghanistan, political and military leaders have been wary to commit ground troops to a counterinsurgency effort in Pakistan. Nor would Pakistani officials have consented to an American occupation. Traditional counterinsurgency, however, calls for a ground deployment allowing troops to gain intelligence through local interaction.

The absence of a ground presence in Pakistan led to a heavy reliance on technology. Using National Security Agency documents leaked by Edward Snowden and the accounts of drone operators, Jeremy Scahill and Glenn Greenwald reported that the NSA has been heavily involved with drone strike targeting. One NSA project, code named "GILGAMESH," uses a

device implanted on a Predator drone to geolocate the SIM (Subscriber Identity Module) card inside cell phones. The GILGAMESH program is primarily used by the Joint Special Operations Command (JSOC) to track and target insurgents for execution. A second NSA program called "SHENANIGANS" used a different instrument to collect data from wireless routers, computers, smart phones, or other electronic devices for the CIA. As impressive-- or intimidating-- as this spy technology sounds, there are numerous problems which hamper their value for accurate intelligence-gathering.[173]

According to a former JSOC drone operator, military incompetence and ingenuity from targeted insurgents frequently made the NSA's intelligence-gathering devices ineffective. Many drone strikes were based solely around the cell-phone's SIM card, not the content of phone calls. Insurgents recognized America's ability to manipulate technology against them, and devised practices to protect themselves from targeting. Numerous militants simply purchased multiple SIM cards, making their cell phone difficult to track. Insurgent leaders also distributed their old cell phones to others within their organization, friends, or family members, making the previous connection of a targeted militant and their SIM card inaccurate. This has led to drone strikes on civilians who possessed a cell phone which had previously been connected to a legitimate militant target. A former drone operator also said that during meetings, insurgents would put all of their SIM cards into a bag, mix them, and then take a new random one, defeating the NSA's efforts to connect specific militants to traceable SIM cards.[174]

Ultimately, this reliance on technology amounts to the targeting of cell phones, not people; inaccuracy is worsened by the lack of other intelligence sources. Supposed safeguards

[173] Jeremy Scahill and Glenn Greenwald, "The NSA's Secret Role in the U.S. Assassination Program," The Intercept, accessed February 23, 2014, https://firstlook.org/theintercept/article/2014/02/10/the-nsas-secret-role/.
[174] *Ibid*.

were in place to maintain precision. Before carrying out a drone strike, the target is supposed to be identified by at least two intelligence sources. However, both sources often originated in NSA technology, not human intelligence. Another safety measure was that drone strikes had to be carried out within sixty days after being approved by the President. However, one former drone operator believes this restriction led military commanders to act rashly, approving drone strikes when civilians were present, fearing otherwise being unable to kill the targeted insurgents.[175]

This hands-off approach to intelligence-gathering resulted in inadequate information about the majority of those killed. The identities of major terrorist leaders executed by drones are obviously known because more effort is put into their assassination; their deaths bolster the success of the overall drone program. However, according to analysis of drone strikes from The New America Foundation, only two percent of the people killed in drone strikes have been high level targets.[176] The majority of people killed in drone strikes are labeled "militants." However, this label is misleading. The Obama administration classifies any adult male killed in Pakistan by a drone strike as a militant, unless posthumous intelligence clears his name. This approach to targeting suggests disinterest in accumulating intelligence before someone is targeted. A former senior intelligence officer concluded that "they count the corpses and they're not really sure who they are."[177]

[175] *Ibid.*

[176] "Drone Wars Pakistan: Analysis," The New America Foundation.

[177] Glenn Greenwald, "'Militants': Media Propaganda," Saloncom RSS, May 28, 2012, accessed February 13, 2014, http://www.salon.com/2012/05/29/militants_media_propaganda/.

Former CIA director Leon Panetta championed his agency's efforts with drones as "the most effective weapon" against terrorism. However, many within the administration consider drone operations in Pakistan to simply be the best of several unpalatable choices.[178]

Fig. 14. North Waziristan, Pakistan, where most drone strikes occur.[179]

Traditional military thinking claims that a ground presence would resolve America's intelligence issues in Pakistan. A 2009 US Army Combined Arms Center briefing by Col. Trey Turner and Major Jay Adair reveals how drones were supposed to be implemented into counterinsurgency efforts. The briefing reviewed operations in Kandahar, Afghanistan in 2008. One of the main conclusions: "Optimal employment of UAVs demands a nuanced understanding of the environment gained only through interaction with the population on the ground." Interaction with the Kandahar locals was a requirement for proper intelligence gathering. According to the briefing, the UAVs would primarily be used for "Targeting" and "Precision

[178] Mark Mazzetti, "The Downside of Letting Robots Do the Bombing," The New York Times, March 21, 2009, accessed February 20, 2014, http://www.nytimes.com/2009/03/22/weekinreview/15MAZZETTI.html?fta=y&_r=0&gwh=8C24D5D9DDA7C314387899EE18BC74BC&gwt=pay.

[179] "North Waziristan, Pakistan," map, CNN, August 14, 2010, accessed March 29, 2014, http://www.cnn.com/2010/WORLD/asiapcf/08/14/pakistan.drone/. Edited by author.

collection" and to "Understand the Environment," or "Find the enemy." Adequate intelligence efforts would utilize both local population and drone technology. Destruction would come from ground forces, conducting "Fix and Finish" operations against insurgents. The briefing's suggestions for UAV implementation counter America's lethal implementation of drones in Pakistan.[180]

The tactical briefing warns against the adoption of the one-sided approach developed in Pakistan. In its discussion of proper UAV implementation, it asserts "If all you have is a hammer, everything looks like a nail." It asserted that proper intelligence and understanding is necessary, impossible without ground assistance. General Stanley McChrystal is quoted as saying "Air power contains the seeds of our own destruction if we do not use it responsibly, we can lose this fight." In both lethal and non-lethal encounters, whether the force came from a drone or soldiers, the importance of further intelligence-gathering with ground troops engaging in face-to-face communication was emphasized as an essential part of the overall counterinsurgency effort.[181]

A strategic research project written by then-Lieutenant Colonel Ken Tovo for the United States Army War College also emphasizes the necessity of a human presence in proper counterinsurgency. Though Tovo's paper is not discussing UAV use, his argument is similar to that presented in the UAV briefing and remains relevant. Tovo emphasizes the importance of local cooperation and participation. He essentially advocates the necessity of winning the hearts and minds of the local population. He says:

[180] Col. Trey Turner and Maj. Jay Adair, *Deadly Persistence: Integrating Armed UAV's and Ground Forces in Kandahar*, issue briefing (United States Army Combined Arms Center, October 16, 2009).
[181] *Ibid.*

> Focused operations require a level of cultural understanding and local area knowledge that only a native can achieve. Attempts to operate unilaterally, without such expertise, can result in indiscriminate use of force and firepower, lost opportunities and a disenchanted, anti-American civilian population.

The lack of an American presence in Pakistan, as UAVs rain laser guided missiles on the inhabitants, has resulted in just what Tovo cautions against.[182]

Arguably the most important and influential critic of America's drone policy has been David Kilcullen. An expert on counterinsurgency, he served as Chief Strategist in the Office of the Coordinator for Counterterrorism at the State Department in 2005 and 2006, senior counter-insurgency advisor for General David Petraeus in 2007 and 2008, special advisor for counter-insurgency to Secretary of State Condoleezza Rice, and, more recently, as an adjunct professor in International Studies at Johns Hopkins University. Kilcullen's critiques of drones echo Tovo's thoughts on counterinsurgency efforts, emphasizing the necessity of involving the populace. Kilcullen's ideal counterinsurgency effort relies on local partnerships which would allow the Pakistani people to begin handling their own security needs and isolate extremists from the communities they inhabit. This directly contrasts America's top-down efforts, distancing its soldiers by exclusively using lethal UAV force.[183]

Intimidation is at the heart of insurgency, extremists wielding power over those they terrorize. According to Kilcullen, the key to defeating insurgency is removing an insurgent's power to intimidate, "something that strikes cannot do." He insists a troop presence is required in proper counterinsurgency. He uses a burglar allusion:

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[182] Ken Tovo, Lt. Col., *From the Ashes of the Phoenix Lessons for Contemporary Counterinsurgency Operations*, report (Carlisle: U.S. Army War College, 2005), 12-13, accessed January 29, 2014, http://www.au.af.mil/au/awc/awcgate/army-usawc/ksil241.pdf.

[183] David Kilcullen and Andrew Mcdonald Exum, "Death From Above, Outrage Down Below."

> Imagine, for example, that burglars move into a neighborhood. If the police were to start blowing up people's houses from the air, would this convince homeowners to rise up against the burglars? Wouldn't it be more likely to turn the whole population against the police? If their neighbors wanted to turn the burglars in, how would they do that, exactly? Yet this is the same basic logic underlying the drone war.

With no American presence in Pakistan, the local population's primary experience with those ostensibly trying to help them are missiles strikes. With no one present to provide aid or improve security, terrorized locals have no choice but to submit to militant rule. Anti-American sentiment will grow when Pakistanis' sole experience is having family and friends killed, or homes destroyed.[184]

Military thinkers place faith in the ability of an American troop presence to improve intelligence collection and counterinsurgency efforts. Cooperation and involvement with the local population is much-valued. America's failure to establish adequate intelligence networks is just one of many factors which make counterinsurgency so difficult. Phoenix's efforts included a direct American presence and heavy Vietnamese involvement but still suffered the same problems.

On November 25, 1967, Directive 381-43 from the U.S. Military Assistance Command, Vietnam (MACV) laid out the proper intelligence gathering practices for ICEX, the program renamed Phoenix later in 1967. Substantial requirements were put in place to ensure only legitimate targets. Provincial Reconnaissance Units (PRUs) initially needed to report a suspect's name, position, rank, and function. Once apprehended, the elimination method of the VCI suspect, whether killed, captured, or convinced to defect, also needed to be filed. ICEX members would conclude their intelligence reports by disclosing the current location and status of the

[184] *Ibid.*

individual, plus any valuable information obtained during the operation. These were the high ambitions at the outset of the program. Though killing VCI members was an acceptable form of elimination, those involved considered intelligence acquisition as the primary goal.[185]

Within three years intelligence-gathering was inadequate. Robert Komer, headed Civil Operations and Revolutionary Development Support (CORDS) which oversaw the Pacification effort, including Phoenix. He wrote an internal report entitled "The Phung Hoang Fiasco" which critiques the intelligence efforts of the Vietnamese branch of the Phoenix Program. Dossiers on VCI targets were described as "incredibly poor." Most neutralization attempts lacked adequate information to justify the pursuit of a supposed VCI target. Fingerprinting, a relatively simple method to document the identity of possible insurgents, was rarely used. The report also noted inadequate information extracted in post-capture interrogations. Ultimately, this lack of information led to the same problem faced with contemporary drones: an indiscriminate effort based on inadequate information which harmed innocent people.[186]

One reason for this failure to conduct informed operations was an unwise quota system, an attempt to quantify results. Internal neutralization statistics from 1970 reveal that the calendar year was divided into four quarters, each with a neutralization goal (one region's goal was 1,050.)[187] This quota system simply put pressure on Phoenix operatives to conduct a high number of operations, rather than encouraging well-informed and fruitful action. The quota

[185] Col. Neil N. Snyder Jr. "*Military Intelligence Reporting on Elimination of Viet Cong Infrastructure*," MACV Directive 381-43, November 25, 1967, The Douglas Valentine Vietnam Collection, Box 5, Folder: Reporting Format, The National Security Archive, Washington D.C.

[186] Robert W. Komer "*The Phung Hoang Fiasco*" July 30, 1970. Box 5, Folder: Komer, Robert Fiasco. Valentine-NSA.

[187] "*Neutralizations- Military region 2 Calendar Year 1970,"* Box 2, Folder: Neutralization Stats, Valentine-NSA.

system also resulted in imprecise sweep operations which detained and persecuted innocent civilians.[188]

America's failure to win the hearts and minds of the populace also contributed to Phoenix's poor intelligence-gathering. Because the population was not favorable to the American cause, few provided information. This meant Phoenix frequently relied on paid informants. The monetary reward for information encouraged informants to provide false reports simply to be paid.[189] America also resorted to torture to force information out of captives.[190]

Phoenix's failures show that American ground troops and local participation is not the cure-all for an ill-informed intelligence effort, or an inefficient program. In reality, it seems unlikely that enough information could ever be gathered to ensure that innocents are never harmed, raising questions of whether a counterinsurgency waged among a population is feasible. Phoenix and drones sought precision in their operations, but additional tactical mistakes reduced accuracy and effectiveness.

B. Imprecision

The precision of UAVs is supposedly one of their greatest assets. President Obama defended his drone-strike-heavy approach to counterterrorism, saying "For the most part they have been precise, precision strikes against al-Qaeda and their affiliates…"[191] Technically he is correct. The ability to launch a single laser guided missile into a target is certainly an improvement over other aerial strikes. However, technical limitations have plagued contemporary drone operations.

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[188] Tovo, *From the Ashes of the Phoenix*, 12.
[189] Guenter Lewy, *America in Vietnam*, 383. Douglas Valentine, *The Phoenix Program*, 108.
[190] McCoy, *Torture and Impunity*, 85-113.
[191] Quoted in Columbia Law School, *The Civilian Impact of Drones: Unexamined Costs, Unanswered Questions*, report (Center for Civilians in Conflict, 2012), 29.

The way drone strikes are carried out, with operators frequently located on the other side of the globe from the war-machine they control, makes the complex camera system extremely important. For Predator and Reaper drones, one operator is solely dedicated to navigating the UAV while another controls the optics and missile targeting. Unfortunately, the optics of Predator and Reaper drones have revealed a phenomenon called the "soda straw" effect. Seeking an accurate missile strike, the targeting operator must zoom in closely on the target. It is this close-up on a target and loss of peripheral vision which causes the soda straw effect, the analogy being that it is "like viewing a small amount of liquid through a soda straw, instead of the entire glass."[192] This reduction in vision damages the accuracy of drone strikes because of individuals walking into the blast radius after a missile has already been launched, resulting in unintended casualties.

Though these deaths are unintentional and caused by a technological limitation, America is hardly absolved of culpability. American military officials are aware of UAV limitations. When mistakes are made because of faulty technology, blame is assigned to the perpetrators. The high demand for drones under President Obama has led major policy makers to encourage rushed production contributing to these technological problems. One example came from former Defense Secretary Robert M. Gates who favored "75 percent solutions over a period of months" rather than waiting an extended period for a "gold-plated" solution. In 2009, Colonel Eric Mathewson, who directed the Air Force's task force on drones, told *The New York Times* that "The context was to do just the absolute minimum needed to sustain the fight now, and accept

[192] *Ibid.*

the risks, while making fixes as you go along." This further places the blame for technical limitations on the military leaders making decisions.[193]

The military had been working on a solution to the soda straw effect, though without much success. Starting in 2007, DARPA supported defense contractor BAE Systems' development of the Autonomous Real-time Ground Ubiquitous Surveillance-Imaging System (ARGUS-IS.)[194] The system's name ARGUS references the mythological Greek figure with 100 eyes.[195] As the reference suggests, ARGUS was a 1.8 billion pixel camera system which could provide drone operators with 65 independent high-definition videos in real time.[196] This would have allowed operators to have both zoomed-in and out video streams as they conducted a drone strike, thus maintaining peripheral vision of the blast area and hopefully eliminating the soda-straw effect. [197] However, the ARGUS-IS has been removed from DARPA's list of active projects and replaced with the ARGUS-IR, focused primarily around Infrared optics.[198]

In early 2013 when DARPA revealed the ARGUS-IS system to the public, it was still being tested and had not yet been incorporated into drone strike operations. Its removal from

[193] Christopher Drew, "For U.S., Drones Are Weapons Of Choice in Fighting Qaeda," The New York Times, March 16, 2009, accessed February 6, 2014, http://www.nytimes.com/2009/03/17/business/17uav. html?adxnnl= 1&fta=y&adxnnlx=1396296297-xLiuFimSeyzJawLW3E4x8w&gwh=16AF9BA09001F4D789 357D0AA2FAA6A0 &gwt=pay.

[194] Doug Beizer, "BAE to Develop Surveillance System," Washington Post, November 12, 2007, section goes here, accessed March 29, 2014, http://www.washingtonpost.com/wp- dyn/content/article/2007/11/11/AR2007 111101348.html.

[195] Michael Kelley, "The NYU Student Tweeting Every Reported US Drone Strike Has Revealed A Disturbing Trend," *Business Insider*, December 12, 2012, accessed February 13, 2013, http://www.businessinsider.com/us-drone-tweets-reveal-double-tap-plan-2012-12.

[196] "Autonomous Real-time Ground Ubiquitous Surveillance-Imaging System (ARGUS-IS)," DARPA RSS, accessed April 01, 2013, http://www.darpa.mil/Our_Work/I2O/Programs/Autonomous_Real-time_Ground_Ubiquitous_Surveillance-Imaging_System_%28ARGUS-IS%29.aspx.

[197] *Rise of the Drones*, dir. Peter Yost (2013), television broadcast, accessed February 24, 2013, http://www.pbs.org/wgbh/nova/military/rise-of-the-drones.html.

[198] "Autonomous Real-time Ground Ubiquitous Surveillance - Infrared (ARGUS-IR)," DARPA RSS, section goes here, accessed March 18, 2014, http://www.darpa.mil/Our_Work/I2O/Programs/Autonomous_Real-time_Ground_Ubiquitous_Surveillance_-_Infrared_%28ARGUS-IR%29.aspx.

DARPA's active projects suggests the project's goals have been abandoned or at least shifted. The soda-straw effect still limits UAV accuracy.

Another major issue with UAV precision is the practice referred to as "double taps," where drones use multiple missiles to destroy targets.[199] Double tap strikes often utilize multiple drones at a time. One example in Pakistan used five drones and led to four missiles launched at a single target.[200] The discovery of this practice was actually revealed by an NYU student, Josh Begley, who has used his twitter account @dronestream to document "Every reported US drone strike" from 2002 to the present. [201] Begley's efforts demonstrate the increasing difficulty of maintaining the secrecy of covert operations. Since the double tap practice was revealed, numerous media sources have investigated further, raising doubt about UAV accuracy. The need for multiple missile strikes already harms UAV's precision image, but increased civilian casualties resulting from this practice has been the main concern. First responders, coming to aid after the initial missile strike, are caught in the blast radius of the subsequent strikes.

There has been at least one instance of friendly fire from a drone strike. On April 5, 2011, drone operators were trying to provide aid to ground troops in Afghanistan as they were attacked by insurgents. Muzzle flashes from the weapons of American troops were thought to be coming

[199] Michael Kelley, "The NYU Student Tweeting Every Reported US Drone Strike Has Revealed A Disturbing Trend."

[200] Zulfiqar Ali, "Two US Drone Strikes Kill 6 Militants in North Waziristan: Officials," The Express Tribune, August 19, 2012, accessed April 07, 2013, http://tribune.com.pk/story/424117/us-drone-strike-kills-four-militants-in-pakistan-officials/.

[201] Josh Begley, "Dronestream," @Dronestream, accessed February 7, 2013, https://twitter.com/dronestream.

from the attacking insurgents. A missile was launched at the Americans, resulting in two deaths.[202]

Phoenix also sought precision and failed. Optimism was high when ICEX, Phoenix's forerunner, was first being organized. An ICEX briefing from August 10, 1967 held the hope that as the program developed "an ever increasing "rifle shot" approach rather than a shotgun approach" would be used to eliminate the VCI.[203] The expected result of this selective use of force would remove enemies without harming the general populace.

In reality, Phoenix operations frequently resembled the blunderbuss rather than rifle. Phoenix's quota system put pressure on operatives to produce numbers. This frequently resulted in cordon-and-sweep operations which affected innocent civilians. Innocent people would be detained as suspected VCI in jails and holding areas, often for weeks or months until they were processed or escaped. These practices ultimately served the VCI more than the American effort. The actual VCI in these jails could indoctrinate their previously neutral civilian cellmates to their ideology and enhance it with the American abuse they were suffering.[204]

Very little was gained from these efforts. The imprecision of Phoenix is apparent in the scores of people it neutralized. American statistics counted 81,740 supposed VCI neutralizations, 26,369 of whom were killed. The GVN said there had actually been 40,994 deaths.[205] By the end of 1969 the US Military Assistance Command, Vietnam estimated that 75-

[202] David S. Cloud and David Zucchino, "Multiple Missteps Led to Drone Killing U.S. Troops in Afghanistan," Los Angeles Times, November 05, 2011, accessed March 30, 2014, http://articles.latimes.com/2011/nov/05/world/la-fg-drone-attack-20111106.

[203] "*ICEX Briefing*," August 10, 1967, Box 4, Folder: SACSA ICEX Briefing, Valentine-NSA.

[204] Tovo, *From the Ashes of the Phoenix*, 12.

[205] McCoy, *Torture and Impunity*, 98.

90 percent of the supposed VCI captured were released or received short jail sentences. Guenther Lewy notes that the majority of suspects "were not neutralized for long, if at all."[206]

C. Low-Level Deaths

A primary goal of American counterinsurgency has been to eliminate the insurgency's leadership, a discriminatory application of force, aimed at egregious offenders. Conventional wisdom holds that an organization minus its leaders is no longer a threat. Contemporary drone policy and the Phoenix Program have championed this approach. However, the actual strategic progress gained from the death of insurgent leaders has been repeatedly challenged. Despite efforts at top-down damage to insurgency groups, the primary result of both programs has been a high, but insignificant, body count.

There are two metrics commonly used to analyze military operations, measures of performance (MOPs) and measures of effectiveness (MOEs.) MOPs are a tactical evaluation of how well an action was executed. MOEs are a more developed, strategic, analysis of an action's effectiveness in achieving overall objectives. Ken Tovo argues that the Phoenix Program mistakenly conflated the two different metrics. Phoenix took an MOP-- the VCI neutralization totals--and considered them to be MOEs. The number of neutralized VCI demonstrated that Phoenix operatives were taking action against the enemy; however it did not analyze the significance of the neutralizations. Numbers alone did not analyze whether the overall goal of reducing the VCI's control of the population had been advanced. In the end, Phoenix neutralized tens of thousands, but the control over the population, and the war, was lost.[207]

[206] Lewy, *America in Vietnam,* 282.
[207] Tovo, *From the Ashes of the Phoenix* , 11-12.

The targeting of insurgent leaders is another instance of conflating MOPs with MOEs. Phoenix and drone policy view killing insurgent leaders as an accomplishment without analyzing how much the enemy has truly been hurt, or the strategic progress made from their deaths. Tovo argues that the death of insurgent leaders means little unless "issues such as replacements, criticality [sic] of losses, or minimum required personnel levels to direct operations" are considered. "Useful MOEs," he notes "require a significant understanding of the enemy, the capability to collect detailed feedback on effects, and major analytical effort." In other words, abundant intelligence is needed to know the effect of a counterinsurgency's actions.[208]

David Kilcullen, discussing drones and the War on Terror, raises another issue resulting from specifically targeting insurgent leaders: personalizing the conflict. He argues that the effort, resources, and bounties devoted to locate terrorist leaders distracts from more important problems and turns the terrorist into a Robin Hood figure. He also notes the insignificance of an insurgent leader's death. Kilcullen uses the death of Abu Musab al-Zarqawi, the head of Al Qaeda in Iraq in 2006, as proof. It took just 18 days for Al Qaeda to replace Zarqawi and resume operations.[209]

The pursuit of insurgent leaders characterizes Phoenix and modern drone policy. Phoenix always sought to neutralize high-level VCI members. When ICEX was first organized in 1967, the "rifle shot" precision was specifically directed towards the elimination of "important political leaders and activists in the VC infrastructure." VCI members were divided into three classes: A for leaders; B for cadre members; and C for low-level supporters. Those in class A or B were supposed to be the main targets.[210] Struggling with this goal, a new experiment was attempted.

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[208] *Ibid*, 12.
[209] David Kilcullen and Andrew Mcdonald Exum, "Death From Above, Outrage Down Below."
[210] "*ICEX Briefing.*"

On June 30, 1971, the Psyop Policy division of the Joint United States Public Affairs Office (JUSPAO) directed Phung Hoang to begin testing a high value rewards program in the Quang Nam, Binh Dinh, Bien Hoa, and Vinh Binh provinces. If successful the program was to be expanded. The goal was to "elicit information leading to the neutralization of specific high level VCI cadre by payment of large cash rewards." In addition to weakening VCI leadership, a primary concern was what effect large rewards would have on the Vietnamese population. Control of the population was a major goal of Phoenix, and counterinsurgencies in general; JUSPAO assumed that in the struggle against communism, capitalism would help.[211]

Phoenix's efforts actually affected insignificant members of the VCI. In January 1969, Richard M. Helms, Director of the Central Intelligence Agency, wrote a report on the overall Pacification effort, including specifics about Phoenix. Helms endorsed Phoenix's pursuit of the VCI, while noting its inefficiency. At this point, thirteen thousand members of the VCI were purportedly killed, captured, or convinced to defect. Helms noted that the total probably included "individuals improperly identified as members of the infrastructure; it certainly includes large numbers of low level cadres who can be replaced fairly easily. The numbers of key cadre eliminated is quite small, since they are the most difficult to find."[212] Poor intelligence hindered operations; legitimate targets went unpunished. Finding replacements for the affected insignificant members, already easy thanks to their simple roles, became even easier as anti-American sentiment grew out of abuse.

These problems remained constant. A Pentagon contract study on Phoenix operations from 1970 through 1971, coinciding with the extra emphasis from the bounty program, found

[211] "*PSYOP Support of GVN Phung Hoang Program (High Value Rewards Program*,)" Supplement No. 2 to Policy Guidance No. 106, July 30, 1971, Box 4, Folder: High Value Rewards Directive, Valentine-NSA.

[212] Helms, Richard M. "*The Pacification Effort in Vietnam*," National Intelligence Estimate Number 14-69, January 16, 1969, Box 2, Folder: CIA Memo NIE The Pacification Effort in Vietnam, Valentine-NSA.

that ninety-seven percent of the Viet Cong targeted were of negligible importance. Fewer than half of the supposed VCI captured or killed by Phoenix were members of the Communist Party. Even Robert Komer, the founder of the Phoenix Program, concluded that it had been a "poorly managed and largely ineffective effort."[213] Non-combatants such as tax collectors and propagandists were targeted for neutralization.[214] From 1968-1971 only twenty-one percent of those targeted for neutralization operated above the local level. All VCI were labeled "dangerous leaders of the insurgency," leading to such abuses as an eighty-year-old woman arrested for part-time commitment as a communist-liaison at the hamlet level.[215]

For all of the deserved criticism Phoenix has received, it at least coincided with an overall Pacification effort which had redeeming qualities. American soldiers carried out civic action programs, taught classes to Vietnamese children, improved hygienic standards in rural villages, and more.[216] In other words, a nominal attempt was made at winning the hearts and minds of the South Vietnamese. Phoenix also attempted, through flawed methods, to accomplish a grand strategic goal of neutralizing the VCI and winning over, or at least controlling, the local population. The same cannot be said for America's counterinsurgency efforts with drones in Pakistan.

Drone policymakers have adopted the same top-down plan which Phoenix attempted, once again with few results. The primary justification for drone use outside of official war zones, in places such as Pakistan, Yemen, and Somalia, has been the pursuit of Al-Qaeda and associated terrorist leaders. Though drones are criticized when mistakes are made, the successful

[213] Lewy, *America in Vietnam*, 285.
[214] Snyder, *Military Intelligence Reporting on Elimination of Viet Cong Infrastructure,* 3.
[215] Lewy, *America in Vietnam*, 281-282.
[216] Dr. John Hoyt Williams, "*The Real War: Marine Pacification in Vietnam,*" August 1983, The Retired Officer, The Douglas Valentine Vietnam Collection, Box 2, The National Security Archive, Washington D.C.

assassinations of terrorist leaders are touted to justify their overall use. Terrorist assassination and civilian casualties are the two primary narratives for America's drone use; individuals tend to emphasize one over the other, depending on their politics and sentiments. In reality, most who are killed in drone strikes are nameless "militants," a term which, as mentioned, has been defined opaquely under the Obama administration. The death of these strategically insignificant individuals has proven counterproductive.

The New America Foundation (NAF), drawing on reputable media reports, has entered every American drone strike, 2004 to 2013, into a database. Their findings counter the Obama administration's rhetorical emphasis on drones killing terrorist leaders. The total death count from drone strikes in Pakistan ranges from 2080 to 3428; only fifty-eight of those have been known militant leaders, roughly two percent of those killed.[217]

The death toll from drone strikes is a contentious issue. For Pakistan, the NAF counts up to 307 civilian deaths, and up to 334 of unknown affiliation. The Bureau of Investigative Journalism counts up to 957 civilian deaths.[218] Since the beginning of Pakistani drone strikes in 2004, 2013 saw the lowest number of civilian casualties; however this reduction coincides with a drastic decrease in the overall number of strikes. This leaves the bulk of the deaths, up to 2787, labeled as "militants." The NAF makes no mention of the controversy surrounding this term, suggesting at least some of those they counted as militants were simply male civilians.[219]

With no ground presence in Pakistan, there can be virtually no American effort to win the support of the local populace. Pakistan's government has regularly protested after drone strikes. America's action in Pakistan has lacked a tangible strategy, and it is unclear how the

[217] "Drone Wars Pakistan: Analysis," The New America Foundation.
[218] "Get the Data: Drone Wars," The Bureau of Investigative Journalism.
[219] "Drone Wars Pakistan: Analysis," The New America Foundation.

accumulation of dead militants helps. An American counterinsurgency has yet again conflated MOPs for MOEs. Kilcullen sees no value in these operations--with no American presence there is no way for the Pakistanis who would resist militant control to do so.[220] Labeling all Pakistani males "militants" also suggests the Obama administration cares little for gaining the support of the local population. Replacing low-level militants becomes easy when no good-will effort has been attempted. The counter-productivity resulting from collateral damage to civilians and property from drone strikes has been an oft-noted critique. It increases anti-American sentiment, fuels vengeful retribution, and turns previously neutral non-combatants into zealous insurgents.

The Phoenix Program and America's modern drone policy have both been unsuccessful efforts at counterinsurgency. America's policies have wasted resources pursuing ill-defined goals, resulting in a large body count, insignificant from a military point of view. These attritional counterinsurgencies have sought to eliminate the enemy, but their policies made it easier for the enemy to replenish its forces. As frustrating as fruitless military action is, the most damning result of American attempts with counterinsurgency are the deaths of civilians caught in the crossfire.

2. Civilian Casualties

Civilian casualties have always been a concern in war. However, the nature of an insurgency fought out among the populace brings an even greater risk to innocents. War's inherent danger to civilian life directly contradicts a counterinsurgency's attempts to protect and win over the local populace.

[220] David Kilcullen and Andrew Mcdonald Exum, "Death From Above, Outrage Down Below."

Political Scientist Colm McKeogh, traces the concern for civilian protection throughout western civilization, culminating in the principle of non-combatant immunity which forbids specifically targeting non-combatants for attack.

> Hebrew, Greek, and Roman philosophers, poets and prophets decried violence against women, children and prisoners…. The Jewish scriptures taught that the innocent ought not to be punished for the crimes of the guilty…. Chivalric codes contributed the idea that one ought not to harm the unarmed and defenceless. Enlightenment rationalism deplored the waste and cruelty of war. And, finally, military professionalism focused on the skill of gaining victory over armed opponents without massacre and wanton destruction.

Through the nineteenth century, every European power casually noted the rights of non-combatants. Civilian protection was the first limitation placed on war in international law. Official recognition first came from the Hague Conferences in 1899 and 1907 and was succeeded by the Nuremberg Trials and Geneva Conventions.[221]

Passed in 1977, Additional Protocol I to the Geneva conventions further laid out the protection of civilians during war. Most importantly, the nations in conflict were to "at all times distinguish between the civilian population and combatants and between civilian objects and military objectives."[222] The United States has signed but not officially ratified the addition. The International Committee of the Red Cross has insisted that, ratified or not, it is part of international law which binds the actions of every nation.[223]

This twentieth century formalization of the rights of civilians has coincided with a radical shift in the ways wars are waged. In *The Command of the Air*, Giulio Douhet, an early and

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[221] Colm McKeogh, *Innocent Civilians: The Morality of Killing in War* (New York: Palgrave, 2002), 2-3.

[222] *Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I)*, issue brief (International Committee of the Red Cross, 1977), 264.

[223] Cornelio Sommaruga, "Appeal by the International Committee of the Red Cross on the 20th Anniversary of the Adoption of the Additional Protocols of 1977," International Committee of the Red Cross, October 31, 1997, accessed March 24, 2014, http://www.icrc.org/eng/resources/documents/article/other/57jnux.htm.

influential proponent for air power, emphasized the airplane's ability to wage war against cities and populations. Targeting the enemy's industrial complex and morale were central tenets of his argument, adopted during World War II by the United States, Britain, and Germany.[224]

Officially, American strategic bombing attempted to avoid civilian casualties during World War II, at least in the European theatre. The atomic bombs dropped on Hiroshima and Nagasaki and the even deadlier firebombing of Japanese cities such as Tokyo showed that America seemingly cared little about the lives and property of civilians. The February 1945 firebombing of Dresden also suggests waning American interest in protecting German civilians. Far from a uniquely American problem, this shift in warfare is evident in many nations' military doctrine, leading to a drastic increase in the number of civilian casualties. A 1999 study by the International Committee of the Red Cross concludes: "The fundamental shift in the character of war is illustrated by a stark statistic: in World War I, nine soldiers were killed for every civilian life lost. In today's wars, it is estimated that 10 civilians die for every soldier or fighter killed in battle."[225]

The Phoenix program was and drone policy has been hazy as to the distinction between civilians and military. Douglas Valentine defines the Phoenix program as an assault on civilians.[226] The VCI inhabited a grey area between civilian and military, aiding the North Vietnamese effort, primarily as non-combatants. For these non-combatant VCI, two of the three neutralization techniques, capture and defection, may have been appropriate, but the third, killing, was not. According to the South Vietnamese government, by the end of the program,

[224] Giulio Douhet, *The Command of the Air* (Tuscaloosa: University of Alabama Press, 2010), accessed February 12, 2014, EBook Collection (EBSCOhost).

[225] Greenberg Research, Inc., *The People on War Report: ICRC Worldwide Consultation on the Rules of War*, report (Geneva, 1999), iii.

[226] Valentine, *The Phoenix Program*, 13.

over forty-thousand of the neutralizations led to death. American kill counts were 26,369.[227] The Obama administration's overly-inclusive definition of militants also clouds the important distinction between civilian and soldier.

These types of relationships are an inherent characteristic of an insurgency and suggest the difficulty of America's protecting civilians while trying to win a war. Blame for civilian deaths is further complicated by the nature of insurgency, insurgents waging war behind the civilian populace. This issue is largely responsible for America's embrace of collateral damage: "unintentional damage or incidental damage affecting facilities, equipment or personnel occurring as a result of military actions directed against targeted enemy forces or facilities. Such damage can occur to friendly, neutral, and even enemy forces."[228] Some, like Guenther Lewy, endorse this rationalization, and blame the insurgents who purposefully endanger civilians in their method of waging war: "If guerillas live and operate among the people like fish in the water, then legally, the entire school of fish may become a legitimate military target." Even if Collateral Damage is accepted as a justified military doctrine, the Phoenix program and modern drone policy have stretched its definition too far.[229]

Lewy's thinking seems to be on a slippery slope; many have critiqued collateral damage as utilitarian excuse. It essentially allows the American military to conduct any operation without concern for civilian casualties as long as there is an ostensible military target. Such moral absolutist philosophers as Thomas Nagel argue that the killing of non-combatants is never

[227] McCoy, *Torture and Impunity*, 98.
[228] Larry Ekburg and John P. Casciano, Gen Maj, *USAF Intelligence Targeting Guide* (United States Air Force, 1998), 180.
[229] Lewy, *America in Vietnam*, 306.

justified and is morally equivalent to murder.[230] In unjust wars, which may or may not include Vietnam and The War on Terror, Philosopher Jeff McMahan would place the guilt of any death, civilian or not, on the aggressor who began the conflict. Every individual involved with the unjust effort would be at fault for any death they caused, including foot soldiers acting in self-defense.[231]

Both positions go too far; in reality, enough evil is present in war for each side to be guilty. Every participant in an armed conflict is responsible for the discriminatory use of force and adherence to the principle of non-combatant immunity. If the war involves an insurgency, then both sides inevitably harm innocents. When the guilt for civilian deaths is being determined, it seems silly to blame a foot soldier reacting to a hostile situation, even if the larger effort is unjust. Though resulting civilian deaths from an American attack on a military target are abhorrent, they are generally unintentional. An insurgency's use of civilian shields is premeditated. Yet, an insurgent effort, albeit unethical, may be strategically sound. The North Vietnamese and Viet Cong had no hope of defeating America in a conventional war, but did so in an unconventional manner. The results of the War on Terror seem to be the same. The death of civilians is arguably the most important reason an insurgency succeeds. The opposing power's invasion and occupation leads to death and abuse which lends legitimacy to the opposing insurgency. The validation of an insurgency allows it to be replenished and survive, making attrition impossible. In Vietnam and the Middle East, insurgencies have proven very effective at draining the will of America to wage war.

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[230] Thomas Nagel, "War and Massacre," *Philosophy & Public Affairs* 1, no. 2 (1972): 123-144, accessed March 25, 2013, http://www.jstor.org/stable/2264967.

[231] Jeff McMahan, "Rethinking the 'Just War,' Part 2," The New York Times, November 12, 2012, accessed February 15, 2014, http://opinionator.blogs.nytimes.com/2012/11/12/rethinking-the-just-war-part-2/?gwh=5C5570613AA298FEE5AB0DFE2F8F0CC0&gwt=pay.

Much of Phoenix's legacy has been sensationalized by antiwar sentiment, from the 1970s to the present. The secondary literature is divided as to what actually happened. Douglas Valentine's *The Phoenix Program* is considered by Phoenix critics to be the definitive work on the subject though it has serious flaws.[232] Moyar's *Phoenix and the Birds of Prey* refutes misinformation and some of Valentine's wilder claims, such as his linking Phoenix to the My Lai massacre.[233]

Phoenix was intended to target primarily civilians, or at least non-combatants. The VCI was mainly a political organization which supported the Viet Cong military effort. Officially, these non-combatants were supposed to be subjected to the police techniques of neutralization, captured and hopefully rallied but not killed.[234] However, there were numerous instances where non-combatant VCI and unaffiliated civilians were abused or killed due to Phoenix.

The Phoenix program was subjected to numerous Congressional and Senate hearings in the early 1970s. These produced testimony revealing Phoenix's poor leadership and indiscriminate operations. Congressional hearings in 1971 demonstrated that between 1968 and 1971 Phoenix had killed 20,587 people identified as VCI. Each year's death totals had outdone the last.[235] In 1971 William Colby, who took over for Robert Komer in leading CORDS and the overall Pacification effort, including Phoenix, defended Phoenix's idealized official policy,

[232] Valentine's only academic credential is a BA in English. He also invokes the death of his father, which he blames the American government for, as an inspiration for writing his book on the Phoenix program. Pg 12.
[233] Moyar, *Phoenix: and the Birds of Prey*, 218-220.
[234] Tovo, *From the Ashes of the Phoenix Lessons for Contemporary Counterinsurgency Operations,* 4.
[235] Lewy, *America in Vietnam*, 281.

emphasizing Phoenix's intelligence-gathering efforts over assassination.[236] He did admit some fault. When questioned by Congressman Ogden Reid, Colby said he was unsure that supposed VCI members could be distinguished from loyal South Vietnamese citizens.[237] By 1973, in hearings for his nomination to become the Director of the CIA, Colby still defended Phoenix but was willing to recognize that "a large number of activities went on that are quite frankly, reprehensible." Colby distanced himself and the program he led from criminal actions; others revealed the truth in their testimony.[238]

In 1970, Komer's report, "The Phung Hoang Fiasco," noted the lack of evidence about the people killed and casts doubts as to their VCI affiliation.[239] This issue, and its repercussions, was further revealed by Michael Uhl, part of a Military Intelligence Team connected to Phoenix, who testified to Congress in 1971. His duties included interrogation and torture in the pursuit of intelligence. Uhl rejected Colby's testimony, insisting he had a "general lack of understanding of what is actually going on in the field." Uhl said that it was impossible that the tens of thousands of VCI neutralizations tabulated could have been carried out according to the official policies Colby presented. He described indiscriminate dragnet operations which led to those who "looked good" being classified as VCI. When the captured Vietnamese were turned over to intelligence workers like Uhl, enormous pressure was placed on them to be identified as civil defendants (CDs) who had violated the law or been involved with the VCI. Uhl claimed that most of the

[236] House, Subcommittee of the Committee on Government Operations, *U.S. Assistance Programs in Vietnam, Hearings*, by William Colby, 92nd Cong., 1st sess., H. Doc. (Washington DC, July 19, 1971), accessed February 15, 2014, http://homepage.ntlworld.com/jksonc/docs/phoenix-hcgo-19710719.html#206.

[237] House, Subcommittee of the Committee on Government Operations, *U.S. Assistance Programs in Vietnam, Hearings*, by William Colby and Ogden Reid, 92nd Cong., 1st sess., H. Doc. (Washington DC, August 2, 1971), 349, accessed January 30, 2014, http://homepage.ntlworld.com/jksonc/docs/phoenix-hcgo-19710802.html.

[238] Senate, Committee on Armed Services, *Nomination of William E. Colby, Hearings*, by William Colby, 93rd Cong., 1st sess., S. Doc. (Washington DC, July 2, 1973), 5, accessed February 11, 2014, http://homepage.ntlworld.com/jksonc/docs/phoenix-sasc-19730702.html#vci.cat.a-b.

[239] Robert W. Komer "*The Phung Hoang Fiasco.*"

CDs he dealt with were women and children.[240] As Uhl indicated, and McCoy has detailed in *Torture and Impunity*, torture was frequently used on those Phoenix captured. Using torture against military personnel violated international law; using it against non-combatants and innocent civilians damns Phoenix further.[241]

False imprisonment and torture was not the full extent of Phoenix's abuses towards civilians. Numerous stories from those involved with Phoenix operations have described horrendous actions which occurred. Vincent Okamoto, a lieutenant with the 25th infantry division in 1968, said that the typical pursuit of a suspect involved a "Phoenix team" (likely a PRU) going into a village and forcing villagers to identify suspected VCI. Okamoto said that the pursuit of VCI suspects he witnessed involved Phoenix operatives forcing a reticent informant into cooperation. Phoenix teams would "put a sandbag over his head, poke out two holes so he could see, put commo wire around his neck like a long leash, and walk him through the village" until the informant identified the house of the suspect. Operatives would return at night and execute the residents.[242]

Stories like this led many to term Phoenix an "assassination program." This label is troublesome because, as noted, Phoenix engaged in much more than simply killing VCI. However, assassinations or targeted killings did take place. In his 1971 Congressional testimony, Colby admits that limited wrongdoings occurred, but insisted they were carried out by

[240] House, Subcommittee of the Committee on Government Operations, *U.S. Assistance Programs in Vietnam, Hearings*, by Michael Uhl, 92nd Cong., 1st sess., H. Doc. (Washington DC, August 2, 1971), 287-362, accessed February 7, 2014, http://homepage.ntlworld.com/jksonc/docs/phoenix-hcgo-19710802.html.

[241] McCoy, *Torture and Impunity*, 85-113.

[242] Christian G. Appy, *Patriots: The Vietnam War Remembered from All Sides*(New York: Viking, 2003), 357-362.

individuals who acted in violation of official Phoenix policies.[243] Though these actions may have been outside the purview of Phoenix directives, testimony from others involved with Phoenix argued that the issues were widespread, known, and ignored. David Sheridan Harrington was a program officer in CORDS and involved with Phoenix operations. During Colby's nomination hearing in 1973, Harrington criticized him for his involvement with Phoenix and misleading the public. Harrington echoed Uhl's testimony, saying "large gaps existed between Phoenix policy in Saigon and operations in the field." Harrington insisted that Colby and other CORDS leaders knew about Phoenix abuses.[244]

Harrington describes attending a high-level briefing in DaNang, 1969. Colby, regional CIA director Harry Mustakos, and other military officials were there as well. According to Harington, Mustakos gave a defensive presentation on the CIA's involvement with the PRUs, detailing the difficulties which led to more deaths than Colby and the CORDS command wanted. He complained that the PRUs, made up of Vietnamese, were frequently out of the control of their CIA handlers, killing too many people, and violating policy. Ultimately, Mustakos' briefing made it clear that "many abuses occurred at the operational level of the Phoenix program, including widespread and uncontrolled assassinations." Harington insisted that Colby's previous testimony was misleading because he knew about these widespread issues. Not only was he aware of these problems, Harrington testified, but little was done to remedy them.[245]

A frequent excuse for military misdeeds is to downplay their frequency, noting only that they violate official policy. The same reasoning is present in Lewy's *America in Vietnam,* which

[243] House, Subcommittee of the Committee on Government Operations, *U.S. Assistance Programs in Vietnam, Hearings*, by William Colby (July 19, 1971), 206-207.

[244] Senate, Committee on Armed Services, *Nomination of William E. Colby, Hearings*, by David S. Harrington, 93rd Cong., 1st sess., S. Doc. (Washington DC, July 20, 1973), 95-100, accessed February 2, 2014, http://homepage.ntlworld.com/jksonc/docs/phoenix-sasc-19730720pm.html#harrington.

[245] *Ibid*, 95-100.

attempts to assuage American guilt over Vietnam because misconduct was not officially condoned.[246] This reasoning makes little sense and is another complication to counterinsurgency efforts which hinders their acceptance. Civilian abuse will never be an official policy but will always happen in war. The fact that Phoenix and counterinsurgencies operate covertly enables these abuses to be more effectively hidden, at least temporarily. When misconduct is finally revealed, the effect is widespread public dissatisfaction, condemnation, and suspicion, reducing support for the overall military operation and further hindering the possibility of a counterinsurgency to succeed.

Supporters of America's modern drone use also like to downplay civilian casualties. In a speech on drone policy, President Obama piously declared: "before any strike is taken, there must be near-certainty that no civilians will be killed or injured."[247] While still a high-level counterterrorism adviser, current CIA director John Brennan attempted to downplay civilian casualties from drone strikes, saying "despite the extraordinary precautions we take—civilians have been accidently injured, or worse, killed in these strikes. It is exceedingly rare, but it has happened."[248] However, external investigation has proven the official record to be false. The Bureau of Investigative Journalism notes 416 to 957 civilian deaths in Pakistan. This may seem low in the grand scale of war. Another interpretation of the statistics would be that each of the 383 supposedly precise strikes in Pakistan has averaged one to three civilian deaths.[249] *Living*

[246] Lewy, *America in Vietnam*, vii.

[247] Barack Obama, "Obama's Speech on Drone Policy," The New York Times, May 23, 2013, accessed February 12, 2014, http://www.nytimes.com/2013/05/24/us/politics/transcript-of-obamas-speech-on-drone-policy.html?pagewanted=all&_r=0&gwh=277B77EEC131453CAACDDACCA0E8BED8&gwt=pay.

[248] John O. Brennan, "The Ethics and Efficacy of the President's Counterterrorism Strategy" (speech, Woodrow Wilson International Center for Scholars, Washington D.C., April 30, 2012), accessed April 02, 2013, http://www.cfr.org/counterterrorism/brennans-speech-counterterrorism-april-2012/p28100.

[249] "Get the Data: Drone Wars," The Bureau of Investigative Journalism.

Under Drones, a joint study by the law schools of Stanford and NYU, refutes the official record, documenting higher civilian casualties and immoral uses of drones.[250]

Double tap drone strikes have hindered precision, resulting in civilian casualties. After the initial missile strike, first responders come to the area in an attempt to provide aid and remove bodies from the wreckage. Islamic funeral tradition calls for burial rituals to be conducted as soon as possible, increasing the presence of civilians at blast zones. The subsequent missiles launched in double tap strikes frequently kill or injure those who have arrived on the scene. Unlike the initial strike which would have presumably been directed at a military target, the subsequent strikes mainly affect civilians. The fear of these subsequent strikes has also delayed locals and humanitarian workers from providing emergency medical care.[251]

Double taps seem to violate the definition of Collateral Damage, in which civilian casualties must be unintentional. Drone operators have live video streams of the targeted area. The arrival of first responders would be visible to operators, suggesting that operators are aware of the civilian presence before launching subsequent missiles.

These double tap strikes also bring American military action close to state terrorism. There is little difference between sanctioned drone double taps and terrorist actions, also referred to as double taps. A 2007 study by the Department of Homeland Security explained the double taps carried out by militant Islamist group Hamas, saying "a device is set off, and when police and other first responders arrive, a second, larger device is set off to inflict more casualties and

[250] Stanford Law School and NYU School of Law, *Living Under Drones: Death, Injury, and Trauma to Civilians from US Drone Practices in Pakistan*, report (International Human Rights and Conflict Resolution Clinic, 2012).

[251] *Ibid*.

spread panic."[252] The only significant difference between the Hamas double taps and the American double taps is that the terrorists lack drones to carry out their attacks.

The Obama administration's redefinition of "militants" to include all adult males is an attempt to present drones as more precise while whitewashing the killing of noncombatant males in drone strikes. It also suggests poor strategy. Indiscriminately labeling an entire populace as the enemy is a strategic and moral blunder. It demonstrates a lack of concern for civilian casualties or winning the support of the Pakistani people. The military has explicitly attempted to suppress the tally of civilian deaths from drones. Brandon Bryant, a former drone operator turned vocal critic of America's policies, reported his personal experience with the cover-up of civilian deaths. Bryant had a tragic experience with the soda-straw effect, the loss of peripheral vision due to the cameras being zoomed in. Responsible for the drone's targeting system, Bryant accidentally killed an unseen child who entered the blast radius after the missile had been launched. When Bryant questioned "Was that a kid?" military superiors responded that "No. That was a dog." Bryant reviewed the scene on video, confirming that the figure in question had two legs, not four. Ultimately, Bryant was convinced this was a purposeful instance of civilian casualty count suppression.[253]

Those killed by America's drone policies are not the only ones harmed. At present time, up to 1,639 Pakistanis have been injured as a result of drone strikes.[254] *Living Under Drones* analyzed the psychological effects that drones have had on Pakistanis. The ever-present threat of a drone strike hitting their community has altered the behavior of those in the affected regions.

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[252] Homeland Security Institute, *Underlying Reasons for Success and Failure of Terrorist Attacks: Selected Case Studies*, report (Arlington: U.S. Department of Homeland Security, 2007), 28.

[253] Nicola Abé, "Pain Continues after War for American Drone Pilot," SPIEGEL ONLINE, December 14, 2012, accessed April 02, 2013, http://www.spiegel.de/international/world/pain-continues-after-war-for-american-drone-pilot-a-872726.html.

[254] "Get the Data: Drone Wars," The Bureau of Investigative Journalism.

Group meetings, including efforts to resolve tribal disputes, are shunned because they draw the attention of drone operators.[255] Up to 202 children have been killed by drones in Pakistan.[256] This has led to parents keeping their children from attending schools.[257] This fear of drones also subdues the population without leaving negative physical evidence. Ultimately, Hap Arnold's desire of using Weary Willy drones to psychologically damage the populace has been realized in the twenty-first century.[258] However, his hope that this would help America win wars has been proven false.

In reality, the anger generated from American drone use has been detrimental to military goals. One of the main reasons Kilcullen has adamantly opposed drone operations in Pakistan is that outrage has spread beyond the affected regions and throughout the country.[259] A Pew Research Center study supports this claim noting that drone use has caused a drastic reduction in the Pakistani population's support for American help in fighting extremist groups. The study concluded that 74% of all Pakistanis consider America an enemy.[260] The Pakistani government frequently protests American action within its borders. Pakistan's ambassador to the United States, Sherry Rehman, has denounced drone strikes as counterproductive, advocating a different approach to fighting terrorism.[261] Faisal Shahzad, who attempted to detonate a car bomb in Times Square, suggested during his trial that he was seeking vengeance in response to drone use.

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[255] Stanford Law School and NYU School of Law, *Living Under Drones.*

[256] "Get the Data: Drone Wars," The Bureau of Investigative Journalism.

[257] Stanford Law School and NYU School of Law, *Living Under Drones.*

[258] General H. H. Arnold, *General H. H. Arnold to Lieutenant General Carl "Tooey" Spaatz,* November 23, 1944, Letter, From Library of Congress, *The Henry Harley Arnold Papers, 1903-1989,* Microfilm, reel 128.

[259] David Kilcullen and Andrew Mcdonald Exum, "Death From Above, Outrage Down Below.".

[260] *Pakistani Public Opinion Ever More Critical of U.S.,* report, June 27, 2012, accessed April 1, 2014, http://www.pewglobal.org/files/2012/06/Pew-Global-Attitudes-Project-Pakistan-Report-FINAL-Wednesday-June-27-2012.pdf.

[261] "Drone Program Is Counterproductive for Pakistan's Goals: Rehman," The Express Tribune, July 10, 2012, accessed February 5, 2014, http://tribune.com.pk/story/406195/concerns-over-drone-strikes-cannot-be-brushed-aside-sherry-rehman/.

Drones have even toppled the Guantanamo Bay prison as the primary method of terrorist recruiting.[262]

Fig. 15.Anti-drone protests in Pakistan, the use of English suggests the protests are for an American audience.[263] [264]

There are additional cultural inspirations for this pursuit of revenge against drone abuses. The primary ethnic group of tribal North Waziristan, where most Pakistani drone strikes occur, is the Pashtun or Pakhtun people. They live under an ancient and unwritten code of ethics called Pashtunwali, translated as "the way of the Pashtuns" or "the code of life."[265] One of the nine principles of Pashtunwali is Badal, the right to seek revenge against a wrongdoer. This right verges on obligation, as the failure to exercise Badal results in the offended being stripped of his honor. The cultural significance of honor is conveyed by the great Pashtun poet Khushal Khan Khattak who wrote "Let the head be gone, wealth be gone, but the honour must not go, because the whole of dignity of a man is due to this honour." The importance placed on revenge creates a

[262] Jo Becker and Scott Shane, "Secret 'Kill List' Proves a Test of Obama's Principles and Will," The New York Times, May 28, 2012, accessed February 01, 2014, http://www.nytimes.com/2012/05/29/world/obamas-leadership-in-war-on-al-qaeda.html?pagewanted=all.

[263] *Pakistani Tribesmen Protest*, September 19, 2012, CNN, accessed April 01, 2013, http://www.cnn.com /2012/09/05/opinion/bergen-obama-drone.

[264] *Anti-Drone Protest*, September 25, 2012, CNN, accessed April 2, 2013, http://www.cnn.com/ 2012/09/25/world/asia/pakistan-us-drone-strikes/index.html.

[265] Erinn Banting, *Afghanistan: The People* (New York: Crabtree Pub., 2003), 14.

cyclical situation as most Badal results in responding Badal.[266] Badal also has no time limit or statute of limitations; the phrase "revenge is a dish best served cold" originated with the Pashtun.[267]

Seeking revenge for a wrongdoing, especially the death of a friend or family member, is far from uniquely Pashtun. However, its cultural formalization suggests it has a powerful influence. Every person killed by a drone strike creates more enemies for America, who are culturally obligated to seek revenge on America. The ill-will generated makes winning an attritional counterinsurgency implausible if not impossible.

The common excuse for civilian casualties resulting from counterinsurgencies has been advocacy for humanitarian intervention--more civilians would be killed if America did nothing. This thinking is a fundamental part of counterinsurgency efforts. In response to allegations of possible Geneva Convention violations, Colby insisted that Phoenix's purpose was "to protect the Vietnamese people from an intolerable and systematic campaign of terrorism and subversion directed by the Viet Cong Infrastructure."[268] In a speech on drone policy, President Obama used similar justifications, saying "To do nothing in the face of terrorist networks would invite far more civilian casualties…. Remember that the terrorists we are after target civilians, and the death toll from their acts of terrorism against Muslims dwarfs any estimate of civilian casualties from drone strikes. So doing nothing is not an option."[269] While it is true that the local populations have suffered most from the Viet Cong and radical Islamic terrorists, this advocacy

[266] Yasmeen Aftab Ali, "Understanding Pashtunwali," The Nation, August 6, 2013, accessed March 01, 2014, http://www.nation.com.pk/columns/06-Aug-2013/understanding-pashtunwali.

[267] Tony Halliday, *Insight Guide Pakistan*, Insight Guides (2000).

[268] Colby, William "*Statement to the House Committee on Government Operations Assessing the Phoenix Program and the Geneva Conventions of 1949."* The Douglas Valentine Vietnam Collection. Box 4, Folder: Geneva/Colby Statement. The National Security Archive, Washington D.C.

[269] Barack Obama, "Obama's Speech on Drone Policy."

of force not only dismisses the numerous issues already raised but ignores the context of terrorist actions.

Terrorist actions disproportionately affect local civilians; the motivation of this action is frequently to oppose the American occupation. The Vietcong carried out gruesome deeds against civilians, but did so for political reasons directed at those cooperating with the Americans. Stanley Karnow discusses the selective brutality of the Viet Cong, relating an incident where two South Vietnamese Policemen were dragged off a bus and publicly decapitated for their cooperation.[270] One justification for using monetary rewards for the high value target program was that the Vietnamese who cooperated would be in grave danger.[271] In CIA operative Frank Snepp's memoir about the fall of Vietnam, he says he feared for the former VCI whom Phoenix had convinced to defect, as well as the Vietnamese Phung Hoang members.[272] In the Middle East, it is unclear how continued American presence will ease tensions. Osama Bin Laden's initial anti-American Jihad was in reaction to Saudi Arabia's decisions after Iraq's invasion of Kuwait. The Saudis preferred American military support, and declined Bin Laden's offer of military assistance. He was also angry because American, non-Muslims would enter the Islamic holy sites, Mecca and Medina. In Iraq and Afghanistan, destabilization wrought by American action has led to sectarian violence. The stated goals of the Phoenix program and drone policy may seem noble, but it is disingenuous to ignore the context for insurgent actions and downplay the violence directly inflicted by American action.

[270] Stanley Karnow, *Vietnam, a History* (New York: Viking Press, 1983), 232-233.
[271] United States, Department of State, American Embassy Saigon, *Phung Hoang High Value Rewards Program 101* (Saigon, 1971), accessed March 5, 2014, Digital National Security Archive.
[272] Frank Snepp, *Decent Interval: The American Debacle in Vietnam and the Fall of Saigon* (London: A. Lane, 1980), 567.

Clearly, American drone policy needs revision. However, counterinsurgencies are covert operations with details withheld out of tactical necessity. This has made public discourse and criticism of the programs more difficult than it should be. The fact that drone operators and commanders are isolated from the field of battle also makes assigning guilt more difficult. President Obama has acknowledged this, noting that covert drone operations "can end up shielding our government from the public scrutiny that a troop deployment invites. It can also lead a president and his team to view drone strikes as a cure-all for terrorism."[273] Ultimately, this lack of transparency under which Phoenix and drones operated leaves the responsibility of revealing American indiscretions to the media. The revelation of American misdeeds stimulates public outrage and more formal condemnation, turning the populace further against the war effort.

3. Covert Corruption, the Media, and Public Outrage

Counterinsurgencies operate covertly out of tactical necessity. This lack of transparency with Phoenix and drones allowed misguided policies to go largely unchecked. Secrecy enabled corruption.

The corruption which pervaded Phoenix is a testament to the appeal of capitalism in a war against communism. Phung Hoang agents falsely arrested and imprisoned civilians simply to extort bribes from their families.[274] Agents were also receptive to bribes from the VCI itself, releasing legitimate VCI members.[275] Informants gave false information simply to be paid.[276] These matters weakened the counterinsurgency effort.

[273] Barack Obama, "Obama's Speech on Drone Policy."
[274] Valentine, 220-221. Lewy, 291.
[275] Dale Andrade and James H. Willbanks, Col., "CORDS/Phoenix Counterinsurgency Lessons from Vietnam for the Future," *Military Review*, March/April 2006, 20, accessed March 1, 2014.

More than corruption occurred. The Paris Peace Accords were signed on January 27, 1973, bringing peace to Vietnam. However, declassified State Department documents reveal that Phoenix Operations were revived after only two months of inaction and in violation of the ceasefire. Major General Nguyen Vinh Nghi "directed all sectors to sharply increase intelligence operations and vigorously root out the Viet Cong Infrastructure (VCI)." Previously, the GVN had attempted to maintain Phoenix through a semantic shift, pursuing "Disruptors of Domestic Tranquility," rather than the VCI. General Nghi's decree lifted this linguistic veil. Notably, Saigon insisted Phoenix be revived "without the fanfare and publicity that it used to receive," proof that such actions violated the peace agreement.[277]

Former Pakistani President, Pervez Musharraf, revealed that the drone war in Pakistan was created under questionable means. America's drone operations outside of official war zones were predicated on pursuing and executing top Al-Qaeda leadership, whose primary goal is to harm America. However, in order to pursue Al Qaeda in Pakistan, the CIA made a deal with Musharraf to begin drone strikes in his country. In 2004 the CIA not only agreed to kill Nek Muhammed but that Pakistani Intelligence would have a hand in drone strike targeting. Muhammed was a Pashtun tribal leader unaffiliated with Al-Qaeda who had rebelled against the Pakistani state. Muhammed flaunted his successes against the Pakistani army, dismissing Musharraf as an American lackey. The very first drone strike carried out in Pakistan killed Muhammed, and others in his compound, including two boys ages ten and sixteen. America's

[276] Lewy, 383. Valentine, 108.

[277] United States, Department of State, American Embassy Saigon, *Phoenix Goes Underground* (Saigon, May 16, 1973), accessed March 17, 2014, Digital National Security Archive.

drone war in Pakistan thus began with an imprecise strike which killed civilians and was not directed against anti-American Al Qaeda.[278]

Despite the covert nature of these programs, details emerged from the media, typically revealing numerous misdeeds. The revelation of such things led to public outrage. With little to no information from the government about these programs, the media accounts are accepted as fact. The end result of this negative media exposure is a loss of confidence in the American government and distrust in the overall military engagement.

Moyar exerts a great deal of effort in *Phoenix and the Birds of Prey* to counter false claims against the Phoenix program. Most of these claims emerged in the anti-war early 1970s, when Phoenix was exposed. Misinformation about Phoenix's misdeeds matters because of Phoenix's covert nature and the existence of numerous abuses. Disillusioned with the Vietnam War, the public accepted anything negative. Media revelations and public outrage towards Phoenix helped bring on Congressional and Senate hearings. Phoenix was titillating enough a subject for a *Penthouse* article, "The Phoenix Murders*"* in the December 1975 issue.[279]

Despite the mistreatment of the Vietnamese, in Phoenix and the larger war effort, the American anti-war movement was primarily driven by anger at American deaths.[280] Since the early days of UAVs, avoiding the loss of American life has been the main appeal of their use. Until recently, the relative safety drones provided Americans helped spur their popularity. In February 2012, a *Washington Post* and ABC News poll found that eighty-three percent of

[278] Mark Mazzetti, "A Secret Deal on Drones, Sealed in Blood," The New York Times, April 06, 2013, accessed March 01, 2014, http://www.nytimes.com/2013/04/07/world/asia/origins-of-cias-not-so-secret-drone-war-in-pakistan.html?pagewanted=all&_r=0.

[279] Treaster, Joseph B."*The Phoenix Murders."* Penthouse. December 1975. The Douglas Valentine Vietnam Collection. Box 3, Folder: The Phoenix Murders. The National Security Archive, Washington D.C.

[280] John Tirman, *The Deaths of Others: The Fate of Civilians in America's Wars* (New York: Oxford University Press, 2011), 123-124.

Americans approved the use of drones against terrorists overseas.[281] Opinion is shifting. Just a year later, March 2013, a Gallup poll reveals that overall support for drone use outside of the US dropped to sixty-five percent.[282]

The second poll was conducted shortly after Kentucky Senator Rand Paul carried out a thirteen hour filibuster on drone policy. Paul's main goal was to illicit a guarantee from President Obama that drone strikes would not be used to target Americans on domestic soil.[283] The issue was raised largely because at least four American citizens have been killed by drone strikes. The most significant shift in the poll results concerned whether Americans should be targeted for drone strikes in other countries. In 2012, seventy-nine percent of those who supported drone use endorsed targeting Americans in other countries.[284] In 2013, after Paul's filibuster, only forty-one percent approved.[285]

A letter from Attorney General Eric Holder admits the four deaths, noting that only one of the four Americans, Anwar Al-Aulaqi, was specifically targeted.[286] This is both comforting and disturbing. The Obama administration's execution of Anwar Al-Aulaqi inhabits a legal grey area because it denied him his right to due process. As an active Al-Qaeda leader, his targeting is understandable if not justified. However, the death of the other three Americans demonstrates the imprecision of drone strikes. One of the others was sixteen year old Abdulrahman Al-Aulaqi, Anwar Al-Aulaqi's son. The strike which killed Abdulrahman was supposed to target Egyptian

[281] "Washington Post-ABC News Poll," Washington Post, February 1-4, 2012, accessed February 19, 2014, http://www.washingtonpost.com/wp-srv/politics/polls/postabcpoll_020412.html.

[282] Alyssa Brown and Frank Newport, "In U.S., 65% Support Drone Attacks on Terrorists Abroad," In U.S., 65% Support Drone Attacks on Terrorists Abroad, March 25, 2013, accessed March 30, 2014, http://www.gallup.com/poll/161474/support-drone-attacks-terrorists-abroad.aspx.

[283] *Ibid*.

[284] "Washington Post-ABC News Poll."

[285] Alyssa Brown and Frank Newport, "In U.S., 65% Support Drone Attacks on Terrorists Abroad,"

[286] Eric Holder, "Holder Letter on Counterterror Strikes Against U.S. Citizens," The New York Times, May 22, 2013, accessed February 01, 2014, http://www.nytimes.com/interactive/2013/05/23/us/politics/23holder-drone-lettter.html?_r=1&.

Al-Qaeda operative Ibrahim al-Banna at a restaurant in Shabwa, Yemen. The intelligence was mistaken, and al-Banna was not there. Instead, a dozen men were killed, including Abdulrahman, who had no connection to terrorism. Thus, intelligence issues caused imprecision and civilian death.[287] The ACLU has filed a lawsuit on behalf of the four dead Americans against former CIA director Leon Panetta.[288]

Popular support for America's drone counterinsurgency has dropped drastically, but a sixty-five percent approval rating is still a significant majority.[289] Military thinkers, such as David Kilcullen, critique America's drone policy in Pakistan, but advocate a traditional counterinsurgency: "Stabilizing Pakistan will require a focus on securing areas, principally in Punjab and Sindh, that are still under government control, while building up police and civil authorities and refocusing aid on economic development, security and governance."[290] Vietnam and Phoenix have taught us this does not work.

Covert counterinsurgencies deny the populace of a Democratic society its right to check the actions of those in power. Misdeeds inevitably occur in war, but attempts to evade guilt did not succeed for those involved in Phoenix or in charge of drone policy. Media revelations concerning Phoenix abuses spurred public outrage, resulting in Congressional and Senate hearings. President Obama did not officially acknowledge America's drone program until May 2013, long after media revelations, NGOs, and victims had spoken out about wrongdoings. The

[287] Mark Mazzetti, Charlie Savage, and Scott Shane, "How a U.S. Citizen Came to Be in America's Cross Hairs," The New York Times, March 09, 2013, accessed May 01, 2014, http://www.nytimes.com/2013/03/10/world/middleeast/anwar-al-awlaki-a-us-citizen-in-americas-cross-hairs.html?pagewanted=all&_r=0.

[288] "ACLU & CCR Lawsuit: American Boy Killed By U.S. Drone Strike," American Civil Liberties Union, accessed March 01, 2014, https://www.aclu.org/national-security/aclu-ccr-lawsuit-american-boy-killed-us-drone-strike.

[289] "Washington Post-ABC News Poll."

[290] David Kilcullen and Andrew Mcdonald Exum, "Death From Above, Outrage Down Below."

secrecy governments adopt when engaged in questionable covert-operations breeds distrust and anti-war sentiment.

Counterinsurgencies waged against amorphous ideologies, whether Communism or Terrorism, have proven to be misguided. These ideological wars happened because America felt threatened; in order for an ideology to be threatening, it needs followers. The devotion of these followers certainly varies in intensity, increasing after the devastation caused by American military action. In addition to being misguided, America's counterinsurgencies have proven to be inefficient and self-defeating. They run counter to American Strategic Culture which prefers short, limited, and decisive conflicts. They seek to eradicate a group, but end up replenishing it. They try to protect innocent life but frequently end it. They win few hearts and minds, all while expending American resources and lives.

CONCLUSION:
THE BIRTH OF A DRONE WORLD

It has taken nearly a century for America to become a drone nation. A major finding of this thesis is that drones are not new, and that one must learn from their overlooked past. The recent growth of drones in significance is undeniable. Other nations recognize this and are progressing quickly.

America pays close attention to foreign drone development. Though American drones have seen the most significant deployment, other nations are not far behind. The Italian Air Force already uses Predator drones.[291] Another American drone, Northup Grumman's Global Hawk, was redubbed the Euro Hawk and sold to Germany.[292] Politics and expense, however, ended this particular foreign drone pursuit.[293] Israel has already engaged in its own deadly drone strikes.[294] In 2009, Russia reportedly spent fifty million dollars on Israeli drones to reverse engineer and improve their existing fleet.[295] Iran has recovered American drones which crashed while likely monitoring Iranian nuclear development. Though embarrassing, most doubt Iran's ability to reverse engineer the technology.[296] According to Hezbollah leader Sayyed Hassan Nasrallah, Iran did provide the components to a surveillance drone which the politico-militant organization deployed over Israel in 2012, before it was shot down. The leader of Israel's Air

[291] "Predator® UAS," General Automics Aeronautical, 2014, accessed April 26, 2014, http://www.ga-asi.com/products/aircraft/predator.php.

[292] "EURO HAWK," Northrop Grumman, 2014, accessed April 28, 2014, http://www.northropgrumman.com/Capabilities/eurohawk/Pages/default.aspx.

[293] Aaron Mehta, "German Political Intrigue Drove Euro Hawk Debacle," Defense News, July 2, 2013, accessed May 5, 2014, http://www.defensenews.com/article/20130702/C4ISR/307020011/German-Political-Intrigue-Drove-Euro-Hawk-Debacle.

[294] Ashraf Sweilam, "Officials: Israeli Drone Strike Kills 5 in Egypt," *Washington Post*, August 09, 2013, accessed May 3, 2014, http://www.washingtonpost.com/world/officials-israeli-drone-strike-kills-5-in-egypt/2013/08/09/75d3619c-0132-11e3-9711-3708310f6f4d_story.html.

[295] "Russia 'will Buy Israeli Drones'" BBC News, October 04, 2009, accessed May 7, 2014, http://news.bbc.co.uk/2/hi/europe/7994076.stm.

[296] Steven Lee Myers and Scott Shane, "Iranians Say They Took Secret Data From Drone," *The New York Times*, April 22, 2012, accessed May 2, 2014, http://www.nytimes.com/2012/04/23/world/middleeast/iranians-say-they-took-secret-data-from-drone.html.

Force, Major-General Shachar Shohat, warned that the nation would have to defend against Hezbollah and Hamas' weaponized drones soon.[297]

All of these efforts pale in comparison to China's pursuit of UAV technology. Chinese drone development is nothing new, though efforts have certainly increased in recent years. American defense contractors that develop drones are a primary target of China's ongoing cyberwar.[298] The US Justice Department indicted five members of the Chinese military in its first-ever hacking charges against a foreign country. Though the charges relate to trade, not military secrets, they set a precedent for future indictments.[299]

Xu Guangyu, a retired Major General who directs China's Arms Control and Disarmament Association, told a *New York Times* reporter that China would increase its drone use. He coyly noted that America's drones were technologically superior, saying "We can only envy their technology. Right now, we're learning from them." China, however, has clearly progressed.[300] Chinese manufacturers are offering cheap knockoffs to other nations.[301] A copy of the Predator drone called the Wing Loong (Pterodactyl) exists and has reportedly been exported to other nation's arsenals.[302]

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[297] "Israel Fears Hezbollah, Hamas Drones: Air Force Chief," Al Akhbar English, March 10, 2014, accessed April 25, 2014, http://english.al-akhbar.com/node/18962.

[298] Edward Wong, "Hacking U.S. Secrets, China Pushes for Drones," *The New York Times*, September 20, 2013, accessed May 2, 2014, http://www.nytimes.com/2013/09/21/world/asia/hacking-us-secrets-china-pushes-for-drones.html?action=click&module=Search®ion=searchResults%230&version=&url=http%3A%2F%2Fquery.nytimes.com%2Fsearch%2Fsitesearch%2F%23%2Fdrones%2F&version=&url=http://query.nytimes.com/search/sitesearch/.

[299] Ellen Nakashima and William Wan, "Chinese Military Unit Charged with Cyber-espionage against U.S. Firms," *Washington Post*, May 20, 2014, accessed May 23, 2014, http://www.washingtonpost.com/world/national-security/us-to-announce-first-criminal-charges-against-foreign-country-for-cyberspying/2014/05/19/586c9992-df45-11e3-810f-764fe508b82d_story.html.

[300] Edward Wong, "Hacking U.S. Secrets."

[301] Jeremy Hsu, "Cheap Drones Made in China Could Arm US Foes," LiveScience, April 05, 2013, accessed May 5, 2014, http://www.livescience.com/28478-china-drone-market.html.

[302] Edward Wong, "Hacking U.S. Secrets."

Fig. 16. China's Wing Loong drone modeled on the American Predator drone.[303]

China's drone deployment is telling. China seeks drones capable of fighting in contested maritime space. Drones were deployed during territorial disputes with Japan. Most American drones, like the Predator, are designed to operate in unopposed air space.[304] Liu Yuejin, director of China's Ministry of Public Security's antidrug bureau, revealed plans to execute a murderous drug lord with armed drones; he was captured instead.[305] The thought of using lethal drones domestically has already alarmed some Americans. The surveillance capabilities of drones are also of great interest to the Chinese police state.

America's drone use has damaged its moral standing. Writing about America's use of torture, Alfred W. McCoy notes the negative impact of American wrongdoing, saying "The state, in all its majesty, must uphold the law and the highest standards of the human community. The state, particularly one that aspires to world leadership, is not only an enforcer; it is an

[303] "Unmanned Aerial Vehicles," SinoDefence, accessed March 13, 2014, http://sinodefence.com/unmanned-aerial-vehicles/.

[304] Edward Wong, "Hacking U.S. Secrets."

[305] Jane Perlez, "Chinese Plan to Kill Drug Lord With Drone Highlights Military Advances," *The New York Times*, February 20, 2013, accessed May 7, 2014, http://www.nytimes.com/2013/02/21/world/asia/chinese-plan-to-use-drone-highlights-military-advances.html.

exemplar."[306] When the world's only superpower ignores or selectively chooses when and where to follow international law and abide by human rights, it weakens the world's ability to regulate the abusive actions of other nations.

America's drone policy has led to formal international condemnation. China, frequently criticized for its human rights violations, has used America's questionable actions in rebuttal. A report, issued by the State Council Information Office of the People's Republic of China, points specifically to the civilian casualties caused by drone strikes.[307] The United Nations Human Rights Council investigated the civilian casualties caused by American drone strikes, calling for independent investigations, oversight, and transparency.[308]

The apparent solution to these problems is binding international guidelines and regulation. In the past, the rise of unregulated, revolutionary war technology drastically changed history. During World War I, Germany's unrestricted submarine warfare ruined President Woodrow Wilson's hopes for neutrality, and led America into the conflict. Nuclear weapons brought an end to World War II in the Pacific, but also ushered in a decades-long arms race which threatened world destruction. Surely, the replacement of man with machines is as revolutionary a change to war as has ever been seen. The fear of fully-autonomous lethal drones,

[306] Alfred W. McCoy, *Torture and Impunity: The U.S. Doctrine of Coercive Interrogation* (Madison, WI: University of Wisconsin Press, 2012), 13.

[307] "Full Text of Human Rights Record of the United States in 2013 - Xinhua | English.news.cn," Xinhuanet, February 28, 2014, accessed March 15, 2014, http://news.xinhuanet.com/english/china/2014-02/28/c_133150579_7.htm.

[308] Ben Emmerson, "Report of the Special Rapporteur on the Promotion and Protection of Human Rights and Fundamental Freedoms While Countering Terrorism," Just Security, February 28, 2014, accessed March 15, 2014, http://justsecurity.org/wp-content/uploads/2014/02/Special-Rapporteur-Rapporteur-Emmerson-Drones-2014.pdf.

though not yet developed, has already brought condemnation from the United Nations and Human Rights Watch.[309]

Binding international regulation of drones is unlikely. Examining the history of drones reveals a repeated warping of the American experience in War. Drone use has been secretive, costly, immoral, inefficient, and counter-productive. In the past, the problems drones faced were recognized, resulting in suspension. The Kettering Bug was halted because of cost and inaccuracy. Operation Aphrodite's drones also had accuracy problems, harming civilians in a manner contrary to America's strategic bombing doctrine. The problems were recognized; the program was stopped. Drones rarely succeeded during the Cold War. The sole exception, the Lightning Bug, proved unworthy of support once the Vietnam War ended and covert funding dried up. Contemporary drones have seen the most significant use and have caused the most significant problems. Their covert use breeds distrust. It allows those in power to sidestep Congressional approval for war. Contemporary policy has focused primarily on terrorist assassination. Drone advocates downplay problems such as inadequate intelligence, inaccuracy, and civilian casualties. Predator and Reaper drones not only produce dead terrorists but anger, resulting in greater extremist recruitment. The fault lies not with drones, which are simply tools, but with misguided policy. The past suggests a solution: recognition of limitations and suspension of misguided policy.

The reliance on drones to fight wars reveals what drone critics term the "schizophrenic ease of remote killing."[310] The relative ease of drone warfare, lacking troop deployment,

[309] Nick Cumming-bruce, "U.N. Expert Calls for Halt in Military Robot Development," *The New York Times*, May 30, 2013, accessed May 15, 2014, http://www.nytimes.com/2013/05/31/world/europe/united-nations-armed-robots.html?_r=0; "Ban 'Killer Robots' Before It's Too Late | Human Rights Watch," Human Rights Watch, November 19, 2012, accessed February 2, 2014, http://www.hrw.org/news/2012/11/19/ban-killer-robots-it-s-too-late.

avoiding American casualties, and costing mere money, makes waging war too easy. Without a meaningful deterrent to war, America may prove too willing to destroy. Drone operators, however, whose job is compared to playing video games, insist they recognize the reality of what they are doing.[311] UAV pilots have developed mental illnesses like Post Traumatic Stress Disorder.[312] While drones remove troops from combat, killing people, even from across the world, still takes a toll. Though the mental anguish of those pulling the trigger is genuine, the suffering of the people receiving missile strikes is more significant. In a speech on drone policy, President Obama has acknowledged that using UAVs is "shielding our government from the public scrutiny that a troop deployment invites. It can also lead a President and his team to view drone strikes as a cure-all for terrorism."[313] As individuals are replaced by remotely-controlled war machines, accountability fades.

For nearly one hundred years, drones have offered the prospect of removing soldiers from combat. Whether this is all for the good is questionable. Drones present a paradox. They save soldiers' lives. If American lives were being lost, however, flawed American action would face greater criticism. Our counterinsurgency in Pakistan would not be happening were drones not replacing troops. Neither Pakistan nor the American populace would allow a ground invasion. America's problematic drone policy allows for: war minus the necessary prerequisites (public debate, Congressional approval, adherence to international law) or requisite consequences. A

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[310] Doug Noble, "Assassination Nation: From the Phoenix Program to Predator Drones," Truthout, August 5, 2012, accessed February 7, 2014, http://truth-out.org/news/item/10697-assassination-nation-from-the-phoenix-program-to-predator-drones.

[311] UAV pilot Chad in Peter Finn, "Rise of the Drone: From Calif. Garage to Multibillion-dollar Defense Industry," Washington Post, December 23, 2011, accessed January 31, 2013, http://articles.washingtonpost.com/2011-12-23/national/35287608_1_mini-drones-engineer-military-doctrine.

[312] Rachel Martin, "Report: High Levels Of 'Burnout' In U.S. Drone Pilots," NPR, December 18, 2011, accessed May 9, 2014, http://www.npr.org/2011/12/19/143926857/report-high-levels-of-burnout-in-u-s-drone-pilots.

[313] Barack Obama, "Obama's Speech on Drone Policy," *The New York Times*, May 23, 2013, accessed February 12, 2014, http://www.nytimes.com/2013/05/24/us/politics/transcript-of-obamas-speech-on-drone-policy.html?pagewanted=all&_r=0&gwh=277B77EEC131453CAACDDACCA0E8BED8&gwt=pay.

final aspect of the paradox is that it reduces the number of people who are well equipped to contemplate war, those with a horror of war's brutality.

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The Henry Harley Arnold Papers are primarily contained within 269 reels of microfilm and include Arnold's correspondence, war journals, speeches, reports, orders, and other material. There is also a set of military mail logs on cardstock. The bulk of the material originates from his time as commanding general of the United States Army Air Corps (1938-1946) and as a member of the Joint Combined Chiefs of Staff (1941-1945). There are numerous documents concerning his role with early drones. These include his correspondence with Brigadier General Grandison Gardner, Charles Kettering, and General Carl Spaatz as well as reports on the progress of the Kettering Bug and Operation Aphrodite. These papers are located in the Library of Congress' Manuscript Reading Room in the Madison Building. I was able to travel to Washington D.C. having received a research grant from LSU's Department of History. Researchers should be aware of a fairly confusing military decimal system with which the microfilm reels are catalogued. The staff can provide a book which explains this system.

The Douglas Valentine Vietnam Collection, The National Security Archive, George Washington University, Washington D.C.

This is an unpublished collection of documents which author Douglas Valentine used to write his book *The Phoenix Program*. It includes declassified documents from the CIA, State Department, CORDS, and individuals involved with Phoenix. The collection is located in the National Security Archive on the George Washington University campus. This collection is stored off site so researchers need to make a request with the Research Coordinator Dr. Marry Curry as well as schedule time in the reading room. I visited the National Security Archive and the Library of Congress on the same research trip, funded by LSU's History Department. I was unimpressed with Valentine's book but grateful for his efforts at compiling relevant documents. Researchers should be aware of an abundance of irrelevant material relating to Valentine's Freedom of Information Act requests as well as court documents from his lawsuits to obtain documents from the CIA. Valentine also donated his interviews stored on cassette tapes.

The Digital National Security Archive.

This is the digitized database of many of the National Security Archive's documents. The database boasts the most comprehensive collection of declassified government documents available with forty-two collections and 103,000 indexed documents. At my request, Hill Memorial library's Assistant Curator of books Michael Taylor obtained a trial subscription to the database for LSU.

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