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The American Army Air Service During World War I's Hundred Days Offensive: Looking at Reconnaissance, Bombing and Pursuit Aviation in the Saint-Mihiel and Meuse-Argonne Operations.

A Senior Paper

Presented in Partial Fulfillment of the Requirements for Graduation

Undergraduate History Program of the University of Washington

By

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2020

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Abstract

The purpose of this paper is to research and analyze the American Army Air Service during the Hundred Days Offensive of World War I. Aviation was a relatively new concept to warfare in the beginning of World War I in 1914 and brought many new concepts to the battlefield, such as aerial observation and reconnaissance, aerial bombing and achieving air superiority. The research conducted reflects the desire to understand the impact American aviation had on ending the war in 1918 and helps others understand the importance and sacrifice made by hundreds of American airmen. The American Air Service played a critical role in Allied operations during the Hundred Days Offensive by replacing horse cavalry as the main means of reconnaissance for the army and creating new effective ways of eliminating enemy targets at long distance through bombing and strafing, which helped bring success in the Saint-Mihiel and Meuse-Argonne battles and aided the Allies' push into Germany to end the war. This topic is particularly significant because it sheds light on one of the lesser covered topics of World War I, which is the American Army Air Service's impact on the Hundred Days Offensive from August 8th to November 11th, 1918. The sacrifice and courage shown by thousands of brave aviators deserves to be remembered for their service in the war to end all wars, which was one of the most destructive events in human history. These aviators paved the way for a world that would come to rely more heavily on aircraft for military conflicts in the years to come up to the present day. Today's United States Air Force still relies on aircraft to perform many of the same tasks as they did in World War I, including reconnaissance, bombing and pursuit aviation, in order to keep the country safe from enemies both foreign and domestic.

Introduction

The United States Air Force has established itself as the largest and most powerful air force in the world. This branch has entirely eclipsed the rest of the world's air forces in terms of strength and technology, but this was not always the case. In 1917, the United States Air Force looked very different, as it was not an independent military branch like it is today. From July 1914 to May 1918 the United States Air Force was called the Aviation Section of the Army Signal Corps and was not a separate branch from the army yet.[1] However, in May 1918 Congress allowed for the section to gain temporary independence from the Army, becoming its own separate branch and gaining the title of United States Army Air Service. This organization was dissolved back into the Army in 1926 and did not gain permanent independence until 1947 when the United States Air Force emerged as an entirely separate branch from the Army.[2]

The Army Air Service lacked its own designs for military aircraft and had to rely on French and British designs.[3] The first year the United States entered World War I was a true test for its military, as it was put up against the well-trained and veteran German army. The Army Air Service participated in many engagements throughout the war, including the battle of Saint-Quentin Canal, the second battle of the Somme and the Saint-Mihiel and Meuse-Argonne offensives. Airplanes as weapons of war were an entirely new phenomenon at the time and were met with much skepticism throughout the militaries of many nations; French General Ferdinand Foch said, "Airplanes are interesting toys but of no military value."[4] The initial use of the

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[1] Airman Advancement Division Professional Development Branch, *The Airman Handbook* (Arlington, VA: Air Force Departmental Publishing Office, 2017) 20.

[2] Airman Advancement Division, *The Airman Handbook,* 24.

[3] *First Air War*, directed by Nick Green (Arlington, VA: Public Broadcasting Service, 2014), 0:50:40 to 0:50:55.

[4] Connie Robertson, *Book of Humorous Quotes* (Hertfordshire: Wordsworth Editions Limited, 1993), 65.

airplane was for reconnaissance purposes; to scout out troop and artillery locations in 1914. This purpose became even more prevalent when the battle lines solidified into trench warfare and movement on both sides ground to a halt.[5] As technology changed, so did the purpose of the aircraft, which transitioned from being used only for reconnaissance in 1914-1915 to including bombing and dog fighting during the remainder of the war. Air superiority between the Allies and Axis powers shifted with the development of more advanced aircraft and better tactics.

By the time the United States entered World War I in 1917, the European countries were beginning to strain from years of constant trench warfare on the Western Front.[6] The German Spring Offensive of July 18th, 1918, known as the *Kaiserschlacht* or Kaiser's Battle, was an offensive campaign orchestrated by the German General, Erich Ludendorff. The operation was unsuccessful, which led to an allied counter-attack known as the Hundred Days Offensive, which began on August 8th, 1918.[7] The plan for the final push against the Germans was a combined effort of Field Marshal Sir Douglas Haig, Supreme Allied Commander Ferdinand Foch, and General John Monash. The Amiens region of France was where the Allies first broke through the German lines in a massive attack of tanks, aircraft, and infantry, which prompted Germany to fight a defensive war for the remainder of the conflict.[8]

The United States' entrance into the war tipped the scale in the Allies' favor. However, the exact role the Army Air Service played in this victory needs further analysis. During the Hundred Days Offensive the United States was tasked with coordinating two major operations,

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[5]Brian Farmer, "Notable of the First World War," *The New American* 33, no. 23 (2017): 33-38.

[6]Charles River Editors, *The Hundred Days Offensive* (Ann Arbor, MI: Charles River Editors, 2015), 2.

[7]Ibid., 5.

[8]Ibid., 9.

which were the Saint-Mihiel offensive on September 12th, 1918 and the Meuse-Argonne offensive on September 26th, 1918. The Saint-Mihiel battle was the first American commanded operation, led by General John Pershing, comprised of the American Expeditionary Force (AEF) and other supporting allied units.[9]These two offensives, alongside the French and British offensives, broke the German lines and eventually led to the Armistice on November 11th 1918.[10]

By the end of World War I, 237 American aviators perished in the war, compared to 8,212 German and 9,378 British aviators, a relatively small number in relation to the overall death toll of the war.[11] With such a relatively small contribution of airpower in the final two years of the war, the overall impact and effectiveness the Army Air Service had on critical operations is less known. This paper will attempt to evaluate the exact impact the United States Army Air Service had on the Hundred Days Offensive in 1918 and prove that it brought new important aspects to warfare, including bombing and pursuit aviation and that it also replaced horse cavalry as the main way to gain reconnaissance. This will be achieved by assessing both primary and secondary source material on the topic of aviation and allied operations in World War I.

Methodology

Primary sources on the Hundred Days Offensive include after action reports, documented orders, books, and memoirs written by people who participated in World War I. After action reports are documents created by military commanders to specifically record what took place

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[9]Donald A. Carter, *St. Mihiel, 12–16 September 1918, The U.S. Army Campaigns of World War I Commemorative Series*, Neumann, Brian F., ed. (Washington, D.C.: Center of Military History United States Army, 2018), 7.

[10]Richard S. Faulkner, *Meuse-Argonne, 26 Sep–11 Nov, The U.S. Army Campaigns of World War I Commemorative Series*, Neumann, Brian F., ed. (Washington, D.C.: Center of Military History United States Army, 2018), 70.

[11]Ezra Bowen, *Knights of the Air* (Alexandria, VA: Time-Life Books, 1981), 175.

during battles. Orders are documents given to commanders of units before the battles begin, with instructions on how to proceed with the engagement. Additionally, some primary source compilations, such as Maurer Maurer's *U.S Air Service in World War 1 Volume 1*, includes an introduction that gives scholarly analysis of the primary sources that follow. Although this paper uses some of the scholarly analysis in the introduction, the primary sources are the focus, which is why the entire source is considered primary for the purposes of this methodology section. The following primary sources are organized by importance to the paper.

The most critical scholarly source on the American Army Air Service, titled *The U.S Air Service in World War 1 Volume 1*, is a compilation of two major primary sources, which are the Final Report (1921) and Tactical History (1920), both cover the American Army Air Service during World War 1 between 1914 to 1918. This volume analyzes the contributions made of the Army Air Service and summarizes the development of the aviation section of the army. The main reason this source is critical in the Scholarly literature is because it analyzes certain aspects of aviation that this paper's main argument focuses on, such as Reconnaissance/ Observation, Bombing and Pursuit aviation. Additionally, these aspects are evaluated in terms of their use during both the Saint-Mihiel and Meuse-Argonne offensives, which is also how this paper is going to evaluate the Army Air Service's impact on the Hundred Days Offensive.

Volumes eight and nine of *Military Operations of the American Expeditionary Forces* in the *United States Army in the World War collection* from the U.S. Army Center of Military History website provides additional information about the Air Service during the Hundred Days Offensive that focuses on documentation from 1917 to 1919.[12] These primary sources are multi-

[12]The U.S. Army Center of Military History, *United States Army in The World War 1917-1919*, vol. 8, *Military Operations of the American Expeditionary Forces* (1948; repr., Washington, DC: Library of Congress Cataloging-in-Publication, 1990), 3.

volume collections of records and reports compiled by the US Armed Forces during the First World War. These collections spans thousands of pages and cover a wide scope of records on U.S. involvement, from training all the way to the end of the war, and are comprised of various types of reports, including as orders, organization documents, policy forming documents, and command reports. These sources are important for the topic because the information specifically shows how air units were expected to assist in the campaigns and the impact they had on the battlefield.

William Mitchell's book *Winged Defense: The Development and Possibilities of Modern Air Power—Economic and Military* (1926), analyzes effective aerial warfare by describing his experiences of commanding all Allied aerial operations during the Hundred Days Offensive. This book is critical in understanding the Army Air Service's effectiveness in the Hundred Days Offensive because the author was present during the events, both as a combatant and commander on the Western Front. Mitchell explains that while planning for a possible continuation of the war to 1919, the United States wanted to be in command of all air units on the Western Front.[13] William Mitchell is considered to be the father of the United States Air Force for his determination in creating a more powerful and better funded Army Air Service. His experience in the war allowed for an accurate prediction of how to use aircraft in future wars and enabled better understanding of how the Army Air Service contributed to the war during its final months.

Although the following source may appear to be a scholarly source due to it being written after the war, *History of the Twentieth Aero Squadron*(1920), qualifies as a primary source because it compiles official personal notes, records, and recollections by Clarence Barth, who experienced military life during the war. In this book, Barth gives the history of the Twentieth

[13]William Mitchell, *Winged Defense; The Development and Possibilities of Modern Air Power—Economic and Military* (New York City: G.P. Putnam's Sons, 1926), 30.

Aero Squadron and its involvement on the Western Front between 1917 and 1918. This book aids in understanding how the Army Air Service's bombing section operated and contributed to the Hundred Days Offensive. Barth gives specific information about bombing raids against the Germans that occurred in September 1918, right before the war ended.[14]

Literature Review

The secondary sources examined for this research topic were taken from several British and American historians, who covered the Hundred Days Offensive. Many of these scholarly sources cite the same primary sources used in this research paper, such as Maurer Maurer's *The U.S Air Service in World War 1 Volume 1*. The consensus is that the AEF contributed significantly to the Hundred Days Offensive and played a key role in ending the war. However, these authors have failed to acknowledge whether the American Army Air Service played a pivotal role in ending the war, further research is needed to fill in this historical gap. The following sources are organized by date, from earliest to latest, and not necessarily by their significance to the research.

In *Knights of the Air* (1981), Ezra Bowen focuses on air warfare in World War I between 1914 and 1918.[15] The book establishes that aircraft played an instrumental role in warfare during World War I by gaining intelligence from reconnaissance, bombing and establishing air superiority through pursuit aircraft.[16] In the first half of the book, Bowen explains the history of the airplane and the many advancements in aerial warfare made during the war. Bowen discusses American aces and the campaigns they fought in, including Edward Rickenbacker, Frank Luke,

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[14]Clarence Barth, *History of the Twentieth Aero Squadron* (1920; repr., Nashville, TN: The Battery Press, 1990), 52.

[15]Ezra Bowen, *Knights of the Air*, 20.

[16]Ibid.

and Joseph Frank Wehner.[17] This book is important for my research because it covers American activity during the Hundred Days Offensive, specifically the history behind many of the famous aces that brought attention and fame to aerial combat.

Bert Frandsen's article, "The Birth of American Airpower in World War I" (2017), reviews the Army Air Service and its involvement in the First World War. Frandsen argues that the organization of the American Army Air Service changed over the course of the war and that it eventually became an effective fighting force by gaining combat experience from the many battles throughout the war, including the Saint-Mihiel and Meuse-Argonne offensives. In addition, he asserts how the number of airmen in the service increased significantly from the time the Army Air Service was first established to when the war ended, which was important in the final offensive against Germany. He explains that during the push into Germany, Colonel Mitchell ordered 1,481 allied planes to bomb and intercept targets up to twenty miles behind enemy lines.[18] An analysis of this time period may reveal important details about the planning and training of American pilots for future operations, and shows the importance of aviation in the final operations to end the war.

John Buchan's book, *1918 Catastrophe to Victory Volume 2: The Allied Hundred Days Offensive* (2018), focuses on the period between August and November and covers the contributions made by all the Allies during the final phase of the war. Although the entire book is broken up into five long chapters, Buchan does a successful job of explaining the timeline of events. He also accounts for the German actions during the offensive, which shows how events on both sides were interconnected. The book is particularly important for this paper because it

[17]Ibid., 156.

[18]Bert Frandsen, "The Birth of American Airpower in World War I," *Air & Space Power Journal - Africa and Francophonie* 8, no. 1 (Spring 2017), 38.

covers the Hundred Days Offensive in extensive detail, including the United States' involvement in the Saint-Mihiel and Meuse–Argonne offensives. Buchan does not cover the impact the allied air services had on the outcome of the war, which is interesting because he goes into such depth on the battles. This omission hints that either the airplanes might not have played a crucial role in ending the war or that there is a gap in research on the topic of American aviation.

The *U.S. Army Campaigns of World War I Commemorative series* (2018), edited by Brian F. Neumann, played a vital role in the research, giving information about both the Saint-Mihiel and Meuse-Argonne campaigns. What made this series unique was the books in it focused on each specific battle, this made it easy to find information on the topic unlike many of the other sources. Two of the book in the series that were used, included *St. Mihiel, 12–16 September 1918,* by Donald A. Carter and *Meuse-Argonne, 26 September–11 November 1918* by Richard S. Faulkner, both of which included a "Strategic Setting" section that provides an in depth analysis of the war in Europe. These two books would be helpful in teaching others about the topic of the American forces in the Hundred Days Offensive.

Bias in the Research

An interesting and unpredicted problem that occurred while researching and examining sources for this paper was a certain bias found between American and British sources. This is significant because a concentration on either British or American sources would result in a somewhat skewed perspective of the importance of events. Information found in the 1964 British TV series documentary *The Great War* does not give credit to the American forces, much less aviation in general during the Hundred Days Offensive.[19] Also, some of the scholarly works on

[19]*The Great War*, episode 23, "When Must the End Be?" Produced by Tony Essex. Written by John Terraine and Corelli Barnett, aired on November 1, 1964 (British Broadcasting Corporation, 1964), 34:08-35:40.

the topic rarely mention the involvement and importance of aircraft, which includes James Hamilton-Paterson's *Marked for Death*. Despite being a book on World War I aviation, there is no mention of American aviation. Only relying on sources like these could give people who interested in the topic the wrong impressions of what happened.

Saint-Mihiel Offensive

All allied air assets in the Saint-Mihiel region fell under the command of American Colonel William Mitchell, who believed "Air forces are the eyes of the army, and without their accurate reports, ground forces cannot operate."[20] He understood and focused on the importance of using the airplane as a means of seeing the battlefield in a way that had not yet been realized before World War I. Although aircraft were intensely used throughout this battle, the heavy rain and fog made it difficult for aircraft to operate.[21] Units assigned for battlefield surveillance and artillery adjustment were often ineffective at their duties due to the inclement weather, which reduced visibility significantly. Another factor that affected artillery adjustment was the constant advancement friendly ground forces, prevented aircraft from having a reliable location to pass information to. Unfortunately pilots were unable to use their radio equipment and were forced to use older methods of relaying information by dropping notes over friendly lines in hopes they would reach their destination.[22] This method severely hindered American artillery, as they were unable to make adjustments according to the reconnaissance pilot's instructions. From this lack of communication, surveillance pilots did not even know which artillery batteries were attacking what targets. The Army Air Service found success in artillery surveillance and adjustment in the

[20]Donald Carter, *St. Mihiel 12-16 September*, 29.

[21]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: Final Report*, 41.

[22]Ibid.

days prior to the Hundred Days Offensive, due to the nature of the stagnant front lines.[23] It was only when the allies began to push into Germany that they struggled with communication between reconnaissance aircraft and artillery batteries.

During the battle of Saint-Mihiel, the only day weather conditions were optimal for flying was September 14th. This added to the already difficult task American and Allied pilots had relaying reconnaissance information to ground forces. However, on September 14th reconnaissance aircraft were able to penetrate German territory and fly up to 60 kilometers behind enemy lines.[24]Squadrons that were tasked with patrolling the region also played a dual role in directly scouting out enemy machine guns nests for the advancing American infantry. These airmen were able to quickly relay information to the advancing infantry about enemy locations by flying low and dropping handwritten messages.[25]

Along with directly flying low over the battlefield, these reconnaissance pilots would sometimes bring up infantry commanders to view the battlefield from the air. Not only did this demonstrate how well different army sections worked together, but it also showed the unique advantage the army had for utilizing reconnaissance aircraft in this way. These infantry commanders were able to view the battlefield in an entirely different perspective, which allowed them to see precisely where enemy units were in relation to their own.[26] Towards the end of the battle, Colonel Mitchell began focusing on long rang bombing and air to air engagements instead of battlefield reconnaissance, since the Germans began falling back to the Hindenburg line.[27]

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[23]Ibid., 214.

[24]Ibid., 37.

[25]Ibid., 41.

[26]Ibid.

[27]Donald Carter, *St. Mihiel 12-16 September*, 53.

Like the other sections of the Army Air Service, the observation balloon section was largely ineffective during the first view days of the battle due to inclement weather. Many of the observation balloons were damaged from the high winds as they ascended into the air.[28] The balloon section found relatively more success with its ability to communicate with advancing infantry when compared to its ability to guide artillery adjustment. Field commanders found information passed by balloons to be very accurate and reliable.[29]Observation balloons assisted with relaying information to Allied artillery batteries just like the reconnaissance planes did. Balloons basically acted as the eyes of the infantry, providing a critical role in frontline operations.[30]

Another critical aspect of air warfare was the use of bomber aircraft, which were tasked with attacking strategically important railroad stations and critical supply points at Mets, Thionville, Mars-la-Tour, Conflans, Dommary, Baroncourt, Longuyon, and the bridges of the Meuse from Dun to Stenay, during this offensive. They also targeted enemy runways and other air facilities often, preventing the Germans from launching aircraft in retaliation to attacks.[31] In an effort to maximize combat power during the battle's most critical days, Colonel Mitchell organized a group consisting of two pursuit groups and a day bombardment group, which patrolled the battlefield and helped deny the German army from retaking ground captured by the Allies.[32] This was particularly important because Mitchell had a small window of opportunity to

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[28]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: A Tactical History*, 383.

[29]Ibid.

[30]Donald Carter, *St. Mihiel 12-16 September*, 30.

[31]Army Center of Military History, *The World War 1917-1919 vol. 8*, 206.

[32]Donald Carter, *St. Mihiel 12-16 September*, 29.

achieve temporary air superiority in the region, as it would take the German air service time to counter attack with enough force to match the Allied air forces at Saint-Mihiel.[33]

Saint-Mihiel night bombing missions were mostly tasked to the other Allies units working with Colonel Mitchell, including the British, French and Italians. The French contributed two bomber squadrons, while the Italians contributed three.[34] The British utilized eight bomber squadrons and although they technically operated independently for the Royal Air Force, they coordinated their support with the Army Air Service.[35] The American Army Air Service only contributed one night bomber squadron during the entire Saint-Mihiel operation, which shows that the Americans at least had a presence in night bombing missions but were ultimately overshadowed by the Allies.

When planning out the attack on the Saint-Mihiel salient, Colonel Mitchell believed the "general mission of aviation is to absolutely prevent access to our lines by enemy reconnaissance aviation."[36] Although the American Army Air Corps was successful in overwhelming enemy air defenses at Saint-Mihiel, with help from other Allied air units, the enemy reconnaissance balloons remained a problem. These balloons were still able to relay information to its artillery counterpart and coordinate effective strikes against American troops. In response to this Colonel Mitchell ordered the First Pursuit Wing to eliminate the enemy balloon presence, which they did successfully.[37]Pursuit squadrons, in general, were tasked with defending the army frontlines from

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[33]Ibid.

[34]Ibid., 28.

[35]Ibid.

[36]Ibid., 29.

[37]Herbert L. Frandsen, *The first Pursuit Group in the Great War: Leadership, Technology, and the Birth of American Combat Aviation* (Auburn, AL: Auburn University Press, 2002), 539.

all enemy aircraft and protected the other Allied reconnaissance squadrons from German fighter aircraft. These squadrons were also expected to attack and strafe any German infantry units along the front lines. These expectations of what the pursuit aviation should do were found in General Pershing's field orders from September 7th. Although this order was given before the battle took place, it shows exactly what the expectations were for pursuit aircraft and what he predicted they were capable of.[38] The resulting victory of the battle is a testament to the importance of pursuit aviation.

Another important aspect of pursuit aviation was its usefulness in protecting Allied bombers from being shot down by German fighters, when crossing over the frontline. American pursuit fighters were tasked with escorting bomber squadrons to and from the target in order to deter German aircraft from attacking them.[39] Bombers could focus on bombing with precision instead of having to concentrate on surviving enemy pursuit aircraft. The importance of pursuit escort can be seen on September 14th during a French bombing raid on Conflans. Due to the bad weather the French bomber squadron was unable to meet up with its American pursuit escort but decided to follow through with the mission over the German line.[40] The squadron was instantly attacked and by the end of the mission only five out of the eighteen bombers made it back to friendly territory safely.[41]

During the battle of Saint-Mihiel, the 94th Aero squadron participated in the attack and were tasked with patrolling and attacking enemy units. The squadron was met with mixed

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[38]Army Center of Military History, *The World War 1917-1919 vol. 8,* 206.

[39]William Mitchell, *Winged Defense,* 167.

[40]Ibid.

[41]Ibid., 170.

success as some of their attacks appeared to cause confusion among the retreating Germans. However, in some cases strafing runs were increasingly troublesome due to the difficult task of differentiating between Allied and German troops in the heat of battle.[42]American pilots usually attacked retreating Germans, who were using horses to drag their artillery pieces back to their lines. Strafing attacks, along with the lunar landscape brought about by artillery and bombing attacks, prevented the Germans from retreating with many of their crucial assets.[43]

The Saint-Mihiel operation was an extremely important engagement for the AEF, as it was the first battle planned and commanded by Americans, and also to General Pershing who needed to achieve victory in order to show how the United States could bring an effective fighting force to Europe.[44] The offensive brough together the largest number of aviation assets committed to one area during the entirety of World War I, which was a total of 1,481 Allied aircraft. This large congregation included 701 pursuit aircraft, 323 day bombers, 91 night bombers, and 366 observation aircraft. The presence of American aircraft on the Saint-Mihiel salient relieved the French air service and allowed them to concentrate most of their forces on operations in the Amiens region. [45] Although the Americans allowed the Allies to redistribute their air forces elsewhere, the Allied air services still dedicated some forces to assist General Pershing in the Saint-Mihiel offensive. The successful tactics Colonel Mitchell implemented on the battlefield would soon be tested in the Meuse-Argonne region, as the AEF began moving into the Argonne forests north-west of the Saint-Mihiel salient.

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[42]Herbert L. Frandsen, *The first Pursuit Group in the Great War*, 566.

[43]Donald Carter, *St. Mihiel 12-16 September*, 34.

[44]Ibid., 7.

[45]Herbert L. Frandsen, *The first Pursuit Group,* 202.

Meuse–Argonne Offensive

The deeper the Allies pushed in the Meuse–Argonne region the denser German defenses became and the need for long range aerial photography increased. During the first part of the offensive, over 56,000 photographic prints were taken and distributed to American forces of German positions over a four day period.[46]When the effectiveness of long range photographic reconnaissance was realized by Colonel Mitchell, he ordered the First Army Observation Group to specifically handle that duty. On good days the group was able to produce around 10,000 photographic prints and had up to fourteen cameras over the frontlines taking pictures at one point.[47]At some points during the offensive, reconnaissance information relayed by aircraft was the only means of keeping the divisional staff aware of enemy movements.[48] With this in mind it can easily be deducted that American military leaders would not have been able to obtain intelligence of enemy activity without the assistance of reconnaissance aircraft. Furthermore, American reconnaissance aircraft were able to spot a large concentration of German units, gathered on the eastern banks of the Meuse river. With this information Colonel Mitchell believed the German army was going to mount a surprise counter attack in that sector and ordered an armada of bomber and pursuit aircraft to pummel the area with around thirty-nine tons of bombs.[49] These aircraft were also reported to have attacked rail targets, troops and other

[46]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: Final Report*, 152.

[47]Ibid., 154.

[48]Ibid., 41.

[49]Edward G. Lengel, ed., *A Companion to the Meuse-Argonne Campaign* (Hoboken, NJ: John Wiley & Sons, Inc., 2014), 317.

support materials near the town of Damvillers, which further crushed the Germans ability to resupply units on the frontlines.[50]

American balloons were inflated the evening of September 25th, right before the attack the following morning and were some of the first aircraft that supported the offensive. They were immediately fired upon in the morning, as the Germans understood their significance in relaying enemy positions to friendly artillery batteries.[51] Thirteen American balloons were used during the Meuse–Argonne offensive, which relayed critical information from the frontlines back to rear command centers. The balloons were able to keep up with the advancing American infantry units, moving up to 30 kilometers by hand a day and established telephone communication to headquarters.[52] This avenue for communication was important because airplanes still had a hard time relaying information to the ground forces that were constantly advancing. As helpful as the Army Air Service balloons were to the AEF, their German counterparts were still more experienced and more accurate with artillery adjustment. German artillery was able to pinpoint where American telephone wire was on the battlefield and destroy it, hindering the communication link between American balloons and their headquarters.[53]Despite this fallback, American observation and reconnaissance units were regarded by American military commanders, as being the most important aspect of air campaign in the Meuse-Argonne offensive.[54]

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[50]Ibid.

[51]Ibid., 314.

[52]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: Final Report*, 44.

[53]Edward G. Lengel, ed., *A Companion to the Meuse-Argonne Campaign*, 348.

[54]Ibid., 313.

In preparation for the Meuse-Argonne offensive, the First Day Bombardment Group carried out bomber operations and hit objectives east of the Moselle River, which gave the enemy the impression of an immediate Americans invasion in the city of Metz. Due to this action, aircraft that attacked the Metz region found an increased number of German planes in resistance to the attack they believed was imminent.[55] Not only did the bomber squadrons of the AEF conduct direct actions against enemy assets, but they also were utilized to deceive the enemy into believing certain areas of the battlefield would be attacked. As a result, the Germans concentrated their forces in the wrong areas, which made Allied attacks in the Meuse-Argonne slightly more effective, initially.[56] Strategic bombing had developed into something more than a tool to create direct destruction but also a tool that could be used to deceive the enemy.

Although bombing was new to the world of aviation and had only been around for a few years, raids on German assets during the Meuse-Argonne offensive were particularly effective. Bombing raids were often inaccurate when dropped from high altitudes, which was unfortunate because the lower the aircraft flew to the ground the more intense anti-aircraft fire would become.[57] However, on October 9th, the Twentieth Aero Squadron was able to demolish an enemy occupied town across the German border, dropping around 2,000 pounds of bombs on the town St. Juvin at an altitude of 12,000 feet. Despite having to drop the bombs from such a high altitude, it was observed that many hit their targets on the town.[58] On the same day the Eleventh Aero squad successfully destroyed a German railway junction that was bringing fresh supplies

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[55]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: A Tactical History*, 371.

[56]Ibid.

[57]James J. Hudson, *Hostile Skies: A Combat History of the American Air Service in World War I* (Syracuse, NY: Syracuse University Press, 1968), 274.

[58]Ibid.

and reinforcements to the Argonne region.[59] This proved to the Germans that American bombers were capable of penetrating deep into their lines, creating a new sense of fear. Similar to the reconnaissance and pursuit squadrons, many of the bomber squadrons were deployed in close proximity alongside the advancing American infantry. On November 1st, several bomber squadrons attacked German infantry and artillery positions along the Meuse River, which enabled Allied ground forces to successfully cross the river and pursue the fleeing Germans further into occupied territory.[60] Bomber squadrons were not usually used in this fashion; the squadrons that directly assisted the advancing infantry had previously been engaged in attacking communication equipment, ammo dumps and large concentrations of enemies behind the line. [61]

The American Air Service's night bombing raids on German air bases and runways during the Meuse-Argonne offensive became so intensive that German aircraft could not stay in one place two nights in a row. They would constantly be on the move during the nights in fear of attack by American bombers.[62]As a result of being on the run constantly, many takeoff and landing accidents occurred which further contributed to the loss of German aircraft. By the end of the war only eight German bombers were in serviceable condition to be surrendered to Colonel Mitchell.[63] Although American night bombers contributed to the Meuse-Argonne offensive, most of the night bombing missions were carried out by the two French and three Italian squadrons that previously assisted in the Saint-Mihiel offensive.[64]

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[59]Clarence Barth, *History of the Twentieth Aero Squadron*, 39.

[60]Army Center of Military History, *The World War 1917-1919 vol. 9*, 367.

[61]Ibid.

[62]William Mitchell, *Winged Defense*, 209.

[63]Ibid.

[64]Edward G. Lengel, ed., *A Companion to the Meuse-Argonne Campaign*, 311.

In preparation for the push into the Argonne forest General Pershing explains in *Field order number 20* that "during the artillery barrage in the area, the pursuit squadron of the First Pursuit Wing will be responsible for protecting American observation assets as well as attack any large concentration of troops aircraft or vehicle convoys."[65] The pursuit escorts were also expected to protect reconnaissance planes at every altitude from the Meuse river in the east to La Hazaree area in the west. This is particularly interesting because the American pursuit squadrons appeared to have taken the brunt of combat during the operation because the remaining French squadrons were only tasked with protecting the right flank in case of an enemy counter attack.[66]The Army Air Service was able to learn a great deal about aviation during the Saint-Mihiel operation and adapted to the ever changing threat of the German military in the Meuse–Argonne region. For example, bomber squadrons learned to fly in close formation as well as fly alongside fighter squadron escorts to better protect themselves.[67] This was particularly helpful because during this period of the Meuse–Argonne offensive the German fighter aircraft were having increased difficulty intercepting and shooting down Allied bombers. A testament to how successful this strategy was, occurred on October 4th, 1918 when a group of thirty German Pfalz and Fokker planes attacked the Ninety-Sixth Bomber Squadron in addition to Twentieth and Eleventh. During the confrontation thirteen German planes were shot down, compared to a single American casualty.[68] Due to the tight formations and fighter escorts the Americans gained air

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[65]Army Center of Military History, *The World War 1917-1919 vol. 9,* 100.

[66]Ibid.

[67]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: Final Report,* 43.

[68]Ibid.

superiority in the region. This dominance in the air cost the German forces their ability to gain reconnaissance information, further hindering their ability to fight off the Allied advancements.

American pursuit aircraft were also effective at attacking ground targets in the Argonne forest, like they had been at Saint-Mihiel. Strafing attacks had become so effective that the Army Air Service began outfitting two-seater reconnaissance aircraft with additional machine guns to attack German ground targets.[69]These attacks were concentrated on enemy infantry, usually causing confusion among their ranks. Army Air Service personnel of the day accurately predicted that future conflicts would rely on the tactic of intense close air support.[70] These predictions were proven to be correct with the wars to come in the following years, such as World War II, the Korean War, the Vietnam War and the Gulf War. Many of the fighter aircraft in the United States Air Force's arsenal today are outfitted with weapons capable of assisting friendly ground targets. For example, the A-10 thunderbolt, which has been serving the United States Air Force since the 1970's, is still in action today and was designed entirely around the concept of close air support.

By this point in the Hundred Days Offensive the Germans stopped bombing during the day, however bombing raids at night remained a common practice in the Meuse-Argonne region.[71] Even though the German war machine was beginning to strain under the stress of the Allied advancements, it still presented a significant threat to the AEF. As a result, Colonel Mitchell was pressured to add a night pursuit squadron to the First Pursuit Group in order to deter German night bombing raids. American commanders also believed that German night

[69]Ibid., 49.

[70]Ibid.

[71]Ibid., 42.

bombing would only get worse as the fighting in the region continued.[72] Eventually Colonel Mitchell developed a way to counter these raids, with a combination of search lights, pursuit aircraft, anti-aircraft batteries and listening posts to signal when enemy aircraft were approaching. The very first night this method was used, American pursuit aircraft successfully intercepted and drove back the incoming German bombers, which undoubtedly saved critical military assets and many Allied lives.[73] Over time German night raids were encountered less due to American pilots successfully intercepting and driving them off during the weeks of fighting in the Argonne forest. [74] In addition to preventing almost all enemy aircraft from deeply penetrating Allied lines, many of the night pursuit pilots managed to successfully attack enemy positions within the German lines.[75] This in combination with attacking enemy aircraft at night most likely played a significant role in raising Allied troop morale as well as severely worsening the already low German morale.

By the end of the war aircraft were being used extensively across the western front by both the Allies and the Axis powers. Their intended purpose had shifted drastically from only being used for reconnaissance in the beginning of the war to being used for bombing and pursuit aviation in the end. Colonel Mitchell, known to many as being the founding father of the Air Force, strongly believed airplanes were useful on the battlefield and would continue to be a crucial element in all military operations to come. [76] He even predicted the importance of

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[72]Ibid.

[73]William Mitchell, *Winged Defense*, 208.

[74]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: A Tactical History*, 318.

[75]Ibid., 323.

[76]William Mitchell, *Winged Defense*, 139.

utilizing aircraft to bomb enemy ships, which would be practiced extensively in the Pacific theater of World War II. Mitchell was so impressed with air power that he would continue emphasizing the importance of aviation during the interwar period and eventually pushed for an independent Air Force after World War II.[77]

Conclusion

Despite being under supplied and inexperienced, the American Army Air Service successfully established itself as an important part of the AEF. Not only did the Air Service prove itself as an effective fighting force to the rest of the world but it also played a critical role in the Allied operation during the Hundred Days Offensive. During the Hundred Days Offensive, American aircraft shot down a total of 731 German planes, destroyed 73 observation balloons, and conducted about 150 bombing raids, dropping around 275,000 points of ordinance on German positions.[78] The reconnaissance squadrons also contributed greatly over the three month period, taking around 18,000 photographs and created 585,000 reprints out of those for the ground forces to utilize in planning attacks.[79] The combinations of all the aviation sections in the Army Air Service allowed for the American military to achieve victory in the Saint-Mihiel and Meuse-Argonne operations, which led to an overall victory on the Western Front. Achieving victory in the American led Meuse-Argonne offensive was particularly important because it gave President Woodrow Wilson more of a say in what was to happen after the Armistice.[80] This would set the United States up as a country of power after World War I.

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[77]Airman Advancement Division, *The Airman Handbook,* 25.

[78]Maurer Maurer, *U.S Air Service in World War 1 Volume 1: Final Report*, 17.

[79]Ibid.

[80]Richard S. Faulkner, *Meuse-Argonne, 26 Sep–11 Nov*, 7.

The AEF was successful in the Saint-Mihiel and Meuse-Argonne battles because of admirable leadership of General Pershing and Colonel Mitchell—who was promoted to the rank of Brigadier General in October 1918—, which can be viewed in their detailed field orders. The orders sufficiently informed subordinates of the expectations placed on them and their units. The Army Air Service's contributions to World War I should not be seen as a simple side note in history, but rather deserves to be viewed as a vital element to Allied operations. Proof of the airplane's effectiveness and necessity is demonstrated in the conflicts that followed the Great War, including World War II, the Korean War, the Vietnam War and the War on Terror up to the present. The airplane has been developed through the years to the point it has become one of the deadliest assets in the United States' arsenal. It is important to remember and understand how far the airplane has come since the early days of World War I and the impact it had on the battlefield during that time. The American aviators of World War I that participated in the Hundred Days Offensive, pioneered combat aviation for the United States and helped develop the Air Force into the powerful entity it is today.

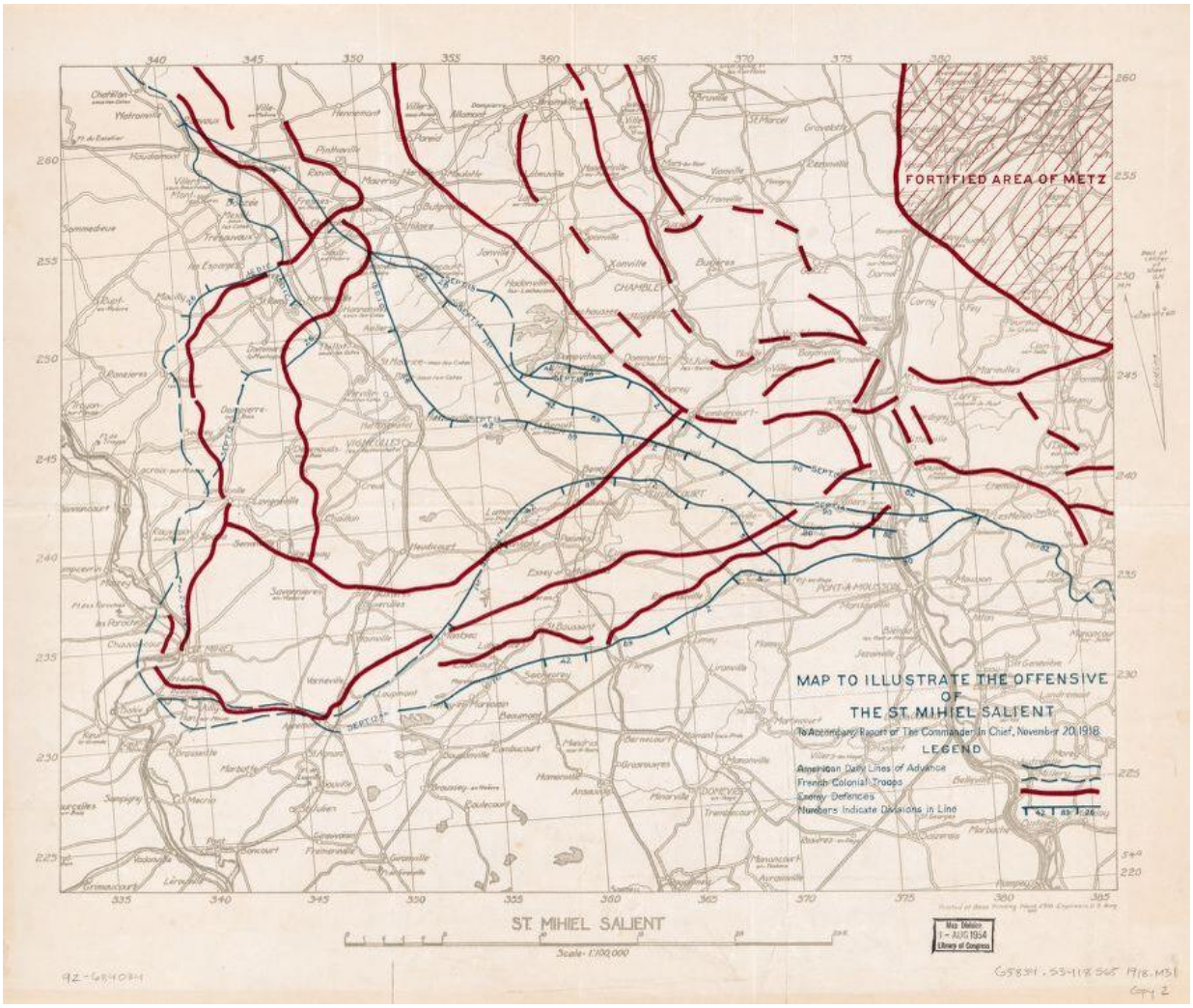

Figure 1. Charles Pelot Summerall, *Map to Illustrate the Offensive of the St. Mihiel Salient*, 1918, 42 x 54 cm., Library of Congress Geography and Map Division, Washington D.C.

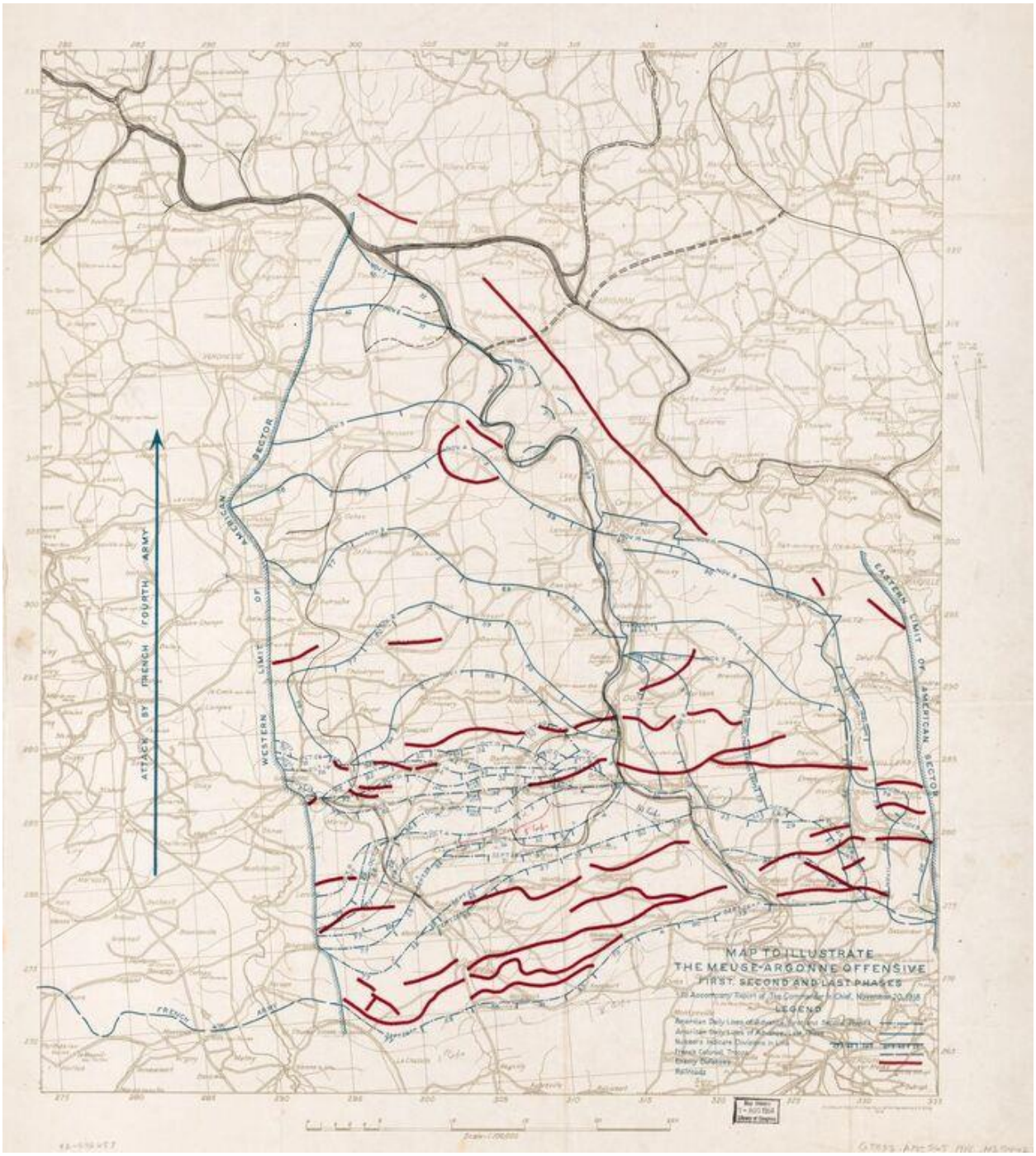

Figure 2. United States Army Engineers 29th, *Map to Illustrate the Meuse-Argonne Offensive: First, Second, and Last Phases*, 1918, 72 x 62 cm., Library of Congress Geography and Map Division, Washington D.C.

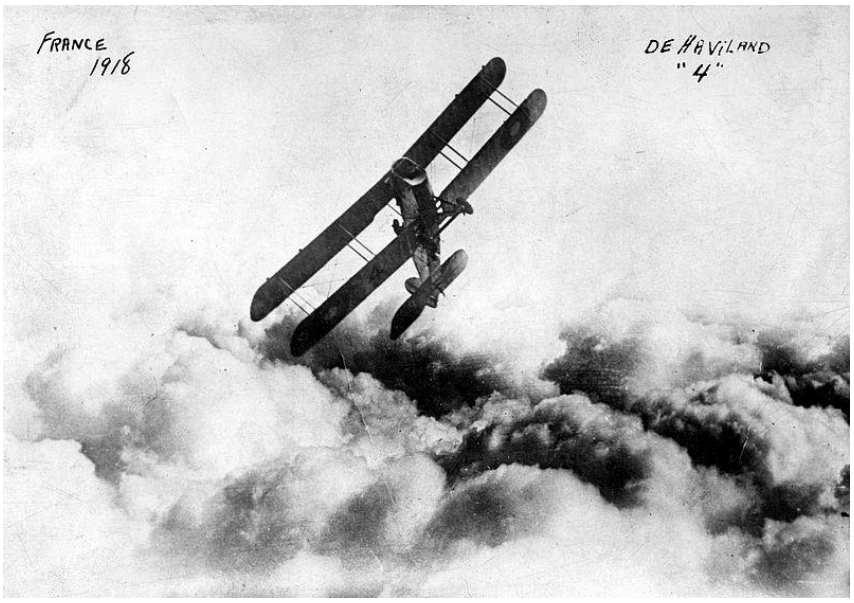

Figure 3. *France, 1918, De Havilland '4*, 1918, Burton Historical Collection, Detroit Public Library, Detroit, MI.

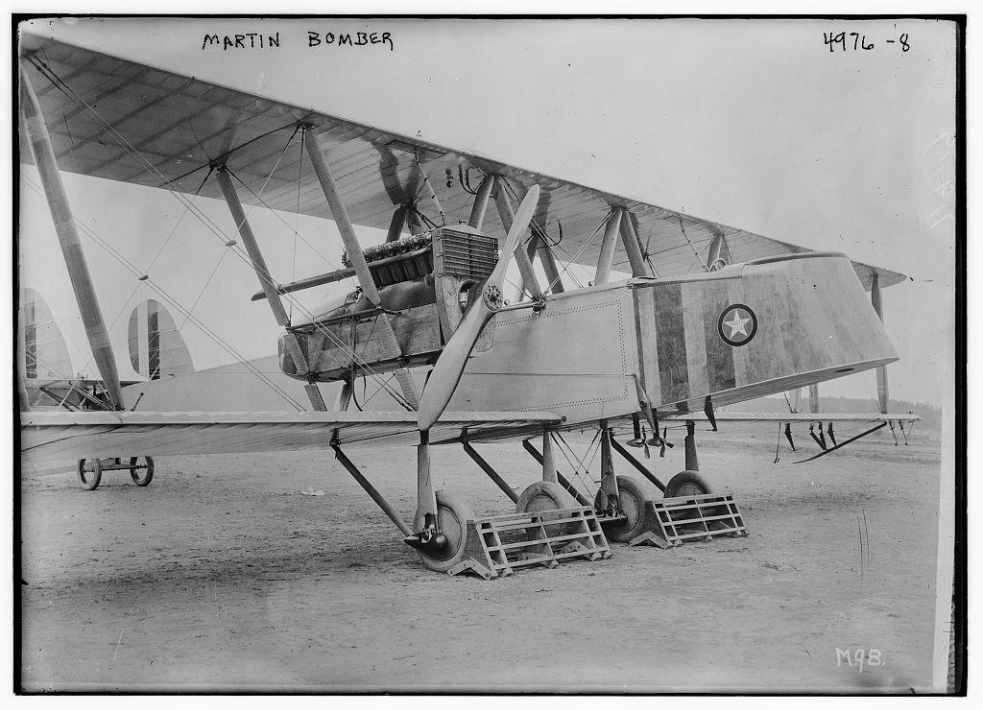

Figure 4. Bain News Service publisher, *Martin Bomber*, 1919, 5 x 7 in., Library of Congress Prints and Photographs Division, Washington, D.C.

Figure 5. *No. 15 Spad Second Pursuit Group*, 1918, Photographic print, Library of Congress Prints and Photographs Division, Washington, D.C.

Figure 6. *Type "R" Observation Balloon at Arcadia Balloon School, Arcadia, Calif.*,1921, 10 x 12.5 cm., Photographic print, Los Angeles Times Photographic Archive Department of Special Collections, Los Angeles, CA.

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