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A GIANT IN THE SHADOWS

Major General Benjamin Foulois and the Rise of the Army Air Service in World War I

Karl R. Schrader
Lieutenant Colonel, USAF



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About the Author

Lt Col Karl R. Schrader received his commission through the Reserve Officer Training Corps, University of Washington, in 1996. Graduating from Joint Specialized Undergraduate Navigator Training in 1997, he went on to fly as an electronic warfare officer on the AC-130U gunship and participated in multiple overseas contingency operations, including Operations Joint Guard, Joint Forge, and Allied Force. In 2001 he became an electronic warfare officer on the RC-135V/W Rivet Joint and again participated in many overseas operations, including Operations Southern Watch, Iraqi Freedom, and Enduring Freedom. He subsequently served as the deputy chief for cyber strategic studies at Headquarters Air Force Space Command and is currently the commander of 7th Expeditionary Airborne Command and Control Squadron in Southwest Asia. Colonel Schrader is a senior navigator with over 2,800 flying hours in the AC-130U, RC-135V/W, and E-8C and has earned multiple flying distinctions, including the 2004 Jerome F. O'Malley Award for "best reconnaissance crew in the United States Air Force."

Colonel Schrader earned a bachelor's degree in electrical engineering from the University of Washington in 1996. He earned a master of aeronautical science degree from Embry-Riddle Aeronautical University in 2004, a master of computer engineering degree from the Air Force Institute of Technology in 2009, and a master of airpower art and science degree from the School of Advanced Air and Space Studies in 2010.

Abstract

This paper examines the military career of Maj Gen Benjamin Foulois to determine how his personal qualities and professional skill enabled him to rapidly build up and lead the air arm of the American Expeditionary Forces (AEF) to victory in World War I. While previous academic works have focused on Foulois's early aviation career from 1909 to 1916 and his tenure as chief of the Air Corps from 1931 to 1935, nothing details the vital role he played in the development of the American Air Service leading up to and during World War I. Foulois's personal and moral courage allowed him to take on the weighty responsibility of designing and executing a $640 million plan to create a combat air force from scratch. After his poor performance as chief of the Air Service, this same courage enabled him to learn from his mistakes and return to the Air Service staff to complete the organizational buildup he started. His skill as a political infighter gave him the insight to advocate patiently for the air arm's interests within the halls of the Congress and the War Department instead of following Billy Mitchell's example of using the blunt instruments of criminal accusations in the court of public opinion to effect change. Foulois's leadership record during the war was mixed; he was much more effective as a logistician and troubleshooter for solving the Air Service's training, aircraft production, and contracting problems than as a combat leader on the front. While Foulois was one of the world's first writers on airpower theory, he chose to focus his later career on developing the technological and organizational innovations he felt were required to bring the airpower theories of others such as Mitchell, Douhet, and Trenchard to fruition. Foulois's leadership, tenacity, forward thinking, and organizational skill hold lessons for future Air Force leaders charged with a similar rapid establishment or expansion of new capabilities, such as a robust remotely piloted vehicle force or a cyber warfare arm of the Air Force.

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I would like to thank my thesis advisor, Dr. Richard R. Muller, and my reader, Dr. Kevin C. Holzimmer, School of Advanced Air and Space Studies, Maxwell AFB, Alabama, for providing the right balance of guidance to keep me on track and freedom to explore my ideas and bring them to fruition. They accepted with gusto the challenge of guiding a computer engineer in the research and writing of a military biography, and I feel that I am a better officer and strategist as a result. Their quick and valuable edits have made the writing process and this resulting paper (surprisingly) enjoyable.

I would be remiss without thanking my wife and children. Their continuous support and understanding were priceless throughout this process.

Chapter 1

Introduction

Benjamin Foulois never set out to become a key figure in the history of American aviation. In fact, his first encounter with a flying machine did not occur until he was 28 years old. As one of America's original military aviators, he flew the Army's first dirigible balloon and its first airplane, learning to fly from early aviation pioneers such as the Wright brothers and Glenn Curtiss. He began thinking about the military uses of airpower in 1907, years before the publication of the theories of William Mitchell, Giulio Douhet, and Hugh Trenchard. Foulois twice led the Army's air forces, as chief of Air Service for the American Expeditionary Forces (AEF) in World War I from 1917 to 1918 and again as chief of the Air Corps from 1931 to 1935. After retiring from the Army, he continued his advocacy of airpower through many speeches and lectures and as head of the Air Force Historical Foundation. Foulois died in 1967, making him one of the few eyewitnesses of military aviation from its beginnings with the Wright Flyer to the technological triumphs of the Mach 3+ SR-71 and globe-spanning intercontinental ballistic missiles.

A majority of the scarce literature on Foulois's military career focuses on his years as the chief of the Air Corps—and for good reason. His role in the infamous air mail fiasco of 1934 had many ramifications for both Foulois and the Air Corps, culminating in the creation of General Headquarters (GHQ) Air Force in March 1935 and Foulois's dismissal as chief of the Air Corps at the end of that same year.[1] In *Airmen and Air Theory*, Col Philip S. Meilinger notes that only three works have addressed Foulois's career: John Shiner's 1983 work, *Foulois and the U.S. Army Air Corps, 1931–1935*; one chapter in the 1987 anthology *Makers of the United States Air Force*, also written by Shiner; and Foulois's 1968 memoir, *From the Wright Brothers to the Astronauts*.[2] Other mentions of Foulois in aviation literature mainly center on his early aviation experiences from 1908 to 1913 and his role in the Mexican Punitive Expedition of 1916. References to Foulois's performance as chief of the Air Service

during World War I are generally limited to his clashes with Mitchell, who famously disparaged Foulois's incoming staff by referring to them as carpetbaggers.[3]

Foulois's role in the Army's aviation buildup prior to and during World War I, however, is not limited to the mutual dislike between him and Mitchell and deserves further examination on its own merits. On the eve of America's entry into the war, the whole of the Army's tactical aviation consisted of a mere 26 pilots and 55 obsolete aircraft. By the signing of the armistice on 11 November 1918, less than 20 months later, America had produced over 9,500 training planes, 4,000 combat aircraft, and 11,400 pilots.[4] How was the Army able to build a world-class air arm from scratch in such a short time, and what was Foulois' contribution to this massive expansion of the American Air Service during World War I? More broadly, what does his experience tell us about the process in creating large organizations almost from the ground up?

This paper examines the military career of Maj Gen Benjamin Foulois from 1897 to 1935 through the lenses of four aspects of Foulois's character to determine how his personal qualities and professional skill enabled him to rapidly build up and lead the air arm of the American Expeditionary Forces to victory in World War I. Looking at Foulois, the man, shows how his personal courage and devotion to duty enabled him to make his first solo flights without the benefit of an instructor, take a newly formed combat squadron into battle with little experience in field operations, and advocate for the Army's aviation arm against the wishes of the General Staff without regard for his career. Examining Foulois the political infighter provides insight into the stark differences between his and Mitchell's methods for advocating airpower, into his methodology for bypassing the General Staff in favor of Congress to achieve his funding goals, and into his keen sense of knowing when—and more importantly when not to—press for an independent air force. An examination of Foulois as a leader shows how his desire to prove the value of airpower drove his decisions as a squadron commander, how his inability to integrate the disparate aviation efforts in France resulted in a mixed record while chief of the American Expeditionary Forces's Air Service, and how his constant conflicts with Billy Mitchell while he led the

First US Army's air arm led to self-doubt and his eventual resignation. Finally, Foulois's early writings on airpower theory show how his thoughts on the uses of airpower evolved over the course of his career from a focus on tactical support of the regular Army to the promise of a war-winning capability in the form of strategic bombing.

The many dilemmas that Foulois faced both before and during World War I have relevance to this day. Today, American ground forces fighting the wars in Iraq and Afghanistan are demanding more, and more persistent, armed reconnaissance in the form of unmanned aerial vehicle orbits. This need has grown over time, increasing from 11 around-the-clock combat air patrols in 2007 to 33 in 2009 and increasing still to 50 orbits by 2011.[5] How will the Air Force procure additional vehicles, expand its data pipeline to and from the controllers and the vehicles, and train additional pilots? Foulois faced a similar situation when the French government requested that America provide a flying corps of 4,500 aircraft and 5,000 pilots for use on the western front, all within 13 months.[6] In October 2009, the head of the Department of Homeland Security announced that she had received funding for the hiring of 1,000 additional cyber security experts to fill staffing gaps in the department's various agencies.[7] Now that the department has its funding, where will it find 1,000 experts in the United States, considering that there are not that many cyber security experts in the Western world? Again, Foulois faced an analogous situation when he secured over $640 million for aviation after America's declaration of war, yet was unable to fill his staff with qualified aviation personnel due to a shortage of experienced pilots.

This paper examines four different chapters of Foulois's military career from his first enlistment at the age of 18 to his retirement as chief of the Air Corps. Chapter 2 looks at his time as an enlisted infantryman and engineer during the Spanish–American War and the Philippine Insurrection and his early aviation experiences as the Army's only heavier-than-air pilot. Chapter 3 covers Foulois's command of the 1st Aero Squadron during the Mexican Punitive Expedition of 1916, his pivotal role in preparing Army aviation for America's entry into World War I, and his rise to chief of the Air Service of the AEF in France. Chapter 4 examines Foulois's performance as chief of

the Air Service, his conflicts with Mitchell, and the reasons for his removal from the post six months later. Chapter 5 looks at his experiences as the chief of Air Service for the First US Army, his responsibilities immediately following the armistice, and his postwar career, culminating in his retirement as chief of the Air Corps in 1935.

In *Airmen and Air Theory*, Meilinger states, "All of us have a deep interest in knowing how others, perhaps like ourselves, have met challenges, dealt with failure, and accommodated themselves to victory and fame."[8] Benny Foulois, during his 37-year career in the Army, never shied away from a challenge and suffered many spectacular failures throughout his career. Yet, ultimately, he succeeded in his quest to place Army aviation on a solid technological and organizational footing to meet the demands of the Second World War. This paper shows how he did it.

Notes

(All notes appear in shortened form. For full details, see the appropriate entry in the bibliography.)

1. Shiner, "Benjamin D. Foulois," 33.
2. Meilinger, *Airmen and Air Theory*, 13–15.
3. See, for example, Morrow, *Great War in the Air*, 272.
4. *Official Record of the United States' Part in the Great War*, 91–96.
5. Hoffman, "UAV Pilot Career Field."
6. Foulois, "Air Service, American Expeditionary Forces (1917–1918)," 2.
7. Krebs, "DHS Seeking 1,000 Cyber Security Experts."
8. Meilinger, *Airmen and Air Theory,* 3.

Chapter 2

Foulois and the Beginnings of Military Aviation (1897–1913)

In the first decade and a half of his military career, Benjamin Foulois rose from a volunteer enlisted engineer serving in the Spanish-American War to one of the most experienced heavier-than-air pilots in the War Department. How did these early infantry and aviation experiences contribute to his thinking on the proper organization and employment of airpower while chief of Air Service in World War I? An examination of his infantry experiences in the Philippines and Cuba, his initial flying experiences with the Wright brothers and Glenn Curtiss, and his service as the only active airplane pilot in the War Department will shed light on the personality traits and early theoretical and practical insights on the uses of airpower that influenced Foulois throughout his career.

Early Life and First Enlistment in the Army

Benjamin Delahauf Foulois was born on 9 December 1879 in Washington, Connecticut, the third of four children. His father, Henry, was born in France in 1850 and served as a tinsmith in the Franco-Prussian War. Disenchanted with French life after the war, Henry immigrated to the United States to put his tinsmith skills to work as a plumber, installing new metal-tubing-based water supplies for towns throughout Connecticut. Foulois attended school for 11 years and then quit to become a plumber like his father and carry on the family business.[1]

Foulois apprenticed under his father for a year and would probably have remained with the family business were it not for the sinking of the battleship USS Maine on 15 February 1898 and the loss of 260 members of her crew. The possibility of war with Spain sparked his first interest in world events, and he was excited at the possibility of a war within his lifetime. The desire to fight in a war as his father had in the Franco-Prussian War and his coworkers had in the American Civil War spurred him to make a trip to New York with the intention of

joining the Navy. Unfortunately for Foulois, the recruiter summarily rejected him because he had no nautical experience whatsoever and did not have his parents' permission, required since he was under the age of 21.[2]

Foulois returned home in despair and returned to work at his father's business until America's declaration of war against Spain in April 1898. Armed with his older brother's birth certificate, he returned to New York City and entered an Army recruiting office that was enlisting for the First US Volunteer Engineer Regiment. Foulois's plumbing experience was enough to convince the recruiter of his potential as an engineer, and the 18-year-old enlisted as William Henry Foulois in May 1898 with an official enlistment date of 7 July 1898.[3]

Soon after enlisting, the War Department shipped Foulois off to Camp Townsend near Peekskill, New York, for engineer training. While he was there, the War Department promoted him to the rank of lance corporal, and he spent a few short weeks learning the basics of building bridges, roads, and fortifications and using surveying equipment, a skill that would serve him well many times throughout his career. His unit shipped out for Puerto Rico at the beginning of July and arrived later that month. With the American naval victory over the Spanish in Santiago Harbor, Cuba, that same month, the Army tasked Foulois's unit with building roads and fortifying camps while the American occupation troops arrived and the Spanish departed. The United States and Spain signed an armistice in August, and Foulois's unit returned to the States soon afterward. The War Department released Foulois from duty with an honorable discharge on 25 January 1899.[4]

Second Enlistment and Two Tours in the Philippines

After his discharge, Foulois returned to Washington, Connecticut, but after having had a taste of the world beyond his small town, he knew he could not spend the rest of his life there as a plumber. His first action was to attempt to secure an appointment to the US Military Academy at West Point for the 1899–1900 school year, but he failed due to a "lack of theoretical school training."[5]

After being turned down, he found out that the Army was forming a company of regulars for service in the Philippines, so with his parents' permission, Foulois enlisted in Company G of the 19th Infantry Regiment on 17 June 1899, this time under his own name.[6] He joined his company at Camp Meade, Pennsylvania, and shipped out for the Philippines in August 1899 for the first of his two tours.

Upon arriving in the Philippines, Foulois performed police duties in Manila for two months and guard duty at the Mariquina waterworks for one month, after which he deployed to the island of Panay. While on Panay, Foulois's battalion participated in counterinsurgency pacification operations from November 1899 to January 1900 and then moved to Cebu Island to perform additional search and destroy operations against Philippine insurgents. Foulois's outstanding performance and natural leadership abilities resulted in a promotion to sergeant and reassignment to garrison duty in Naga in the fall of 1900. For eight months, he participated in the Army's civic action program as a schoolteacher for the children of Naga. Foulois would later find out that many of his young students eventually became leaders in the Philippine government, directing guerrilla forces against the Japanese occupation forces during World War II.[7]

In February 1901, Foulois's company commander ordered him to take the officer qualification exam. Cognizant of his lack of education, Foulois questioned his ability even to come close to passing the exam, to which his commander replied that the officer selection board, headed by a member of his regiment, would also take into account his field performance. His commander was correct and the War Department commissioned Foulois as a second lieutenant on 9 July 1901. Foulois later remarked, "Whatever value they attached to my two years of field service with troops must have outweighed my ignorance."[8]

From the fall of 1901 to the spring of 1902, Lieutenant Foulois deployed to the island of Mindanao to take up civil government functions in the city of Cottabato. As the commander of Company D, 17th Infantry Regiment, he used many unorthodox methods for keeping his soldiers healthy while securing the area against the Moro insurrection. To stem the high incidence of venereal disease among his soldiers, Foulois adopted the British model

of establishing an official brothel that met all hygienic standards. To quell the local Moro insurrection, he leveraged America's technological advantages over the previous Spanish occupiers, in the form of the telephone and the phonograph, to prove the futility of resisting, eventually winning over and making an ally of the Moros' leader, Dato Piang.[9]

Upon completion of the mapping of the Rio Grande area of Mindanao, Foulois finished his first tour in the Philippines as a part of John Pershing's Lake Lanao expedition against another faction of the Moros.[10] While Foulois's company was building a bridge using timbers double the size called for in the manual, Pershing rode up and asked why he was using such large timbers. Foulois replied, "Because we don't want to have to come back here a second time and build it again." Years later, when Pershing hired Foulois to head the Air Service in France during World War I, he reminded Foulois of that day and told him to apply the same philosophy to building the Air Service.[11]

Foulois's unit returned to the United States in June 1902, and he spent the next 10 months attending officer schooling and participating in various field exercises. In June 1903, he returned to the Philippines for a second tour to continue the fight against the Moro insurrection. Over the next two years, Foulois served as the topographical officer to the operation's commander, participating in mapping expeditions and multiple operations to wipe out Moro factions in Mindanao and the Sulu Archipelago. Foulois applied to the Infantry and Cavalry School while in the Philippines and won admittance to the professional education program at Fort Leavenworth, Kansas, for the 1905–6 school year.

Professional Military Education and a Detour to Cuba

Foulois reported to the Infantry and Cavalry School in July 1905 and found the transition from combat to peacetime instruction jarring. While at the school, he found it difficult to accept the book solutions espoused by instructors who had never seen combat. As a result, he compiled a correspondingly unimpressive academic performance, finishing near the bottom

of his class.[12] The year was not a total loss, however, as Foulois made the acquaintance of several Signal Corps's officers and became intrigued by their explanations of the uses of telegraphy and ciphers. Further discussions about the Signal Corps's exploration of steerable balloons powered by propellers and the Wright brothers' idea of mating a glider and an engine to create an "aeroplane" convinced Foulois to apply for a transfer to the Signal Corps while still at the Infantry School. The War Department approved his transfer and assigned him to the Army Signal School class of 1906–7.[13]

However, the Army Signal School would have to wait. In September 1906, Foulois rejoined his infantry regiment and deployed to Cuba as part of the Army of Cuban Pacification to quell an uprising on the island. His previous mapping and surveying experience in the Philippines led to his reassignment to Maj Mason M. Patrick, the chief engineer of the expeditionary force. This was not their last encounter; Patrick would later relieve Foulois as chief of Air Service for the American Expeditionary Forces during World War I. On 16 October 1906, the War Department promoted Foulois to first lieutenant in the Signal Corps.[14] While in Cuba, Foulois made military maps of over 1,800 square miles of the island, introduced improvements in efficiency to the mapping procedures, and received several commendations for his thoroughness and accuracy.[15]

Foulois returned from Cuba in May 1907 and, after taking leave, started the Army Signal School in September. Besides undergoing the regular curriculum of classroom instruction, each student had to write a short thesis on a topic of special interest. During his instruction, Foulois noticed a dearth of information on the possible military uses for dirigibles and aeroplanes. The result was a 10-page paper titled "The Tactical and Strategical Value of Dirigible Balloons and Dynamical Flying Machines" that would radically alter the course of Lieutenant Foulois's life.

The Army Signal School Thesis

Even though he had never seen a dirigible or an aeroplane before writing his thesis, Lieutenant Foulois made several interesting conjectures about the uses of airpower in support of

the land campaign, including reconnaissance, artillery spotting, and air-to-ground attacks. He also made several prescient observations on the importance of gaining and maintaining air superiority over the battlefield.

Foulois opened his thesis with an indictment of Army aviation, asserting that it had been "handicapped by a short sighted Congress" and required significant resources to catch up to the European powers who had "taken the lead in aerial accomplishments."[16] He then noted that the "dynamical flying machine is still in the experimental stage, but if it continues to progress toward perfection as rapidly in the next year or two, as it has in the past two years . . . tacticians will have to revise their books on tactics, to include the subject of aerial reconnaissance."[17] However, he was ambivalent about whether the dirigible or the aeroplane would perform better in the reconnaissance role, comparing the greater carrying weight and faster vertical acceleration of the dirigible against the faster speed and greater immunity to weather conditions of the aeroplane.[18]

Regardless of the platform, Foulois saw great potential in the ability of aircraft to supplement or even replace cavalry as the commander's primary reconnaissance force. He foresaw aircraft operating in advance of the cavalry, covering larger areas, and performing reconnaissance faster, stating that "the principle duty of the aerial fleet will be that of keeping in touch with the enemy, and transmitting as quickly as possible, accurate information relative to the strength and disposition of his forces."[19] He also saw aircraft assisting in maintaining the security of friendly forces by reconnoitering the vulnerable flanks of an army on the move and allowing the army to "march in perfect peace so far as the possibilities of a surprise or an attack from an unexpected quarter are concerned."[20]

Aircraft would also be of great use in supporting the Army's artillery forces. Artillery at the turn of the century was beginning to employ modern methods of indirect fires, making it difficult for traditional cavalry to locate enemy batteries deep behind enemy lines. However, an aircraft searching for enemy artillery positions could quickly cover a large area and "as soon as the range [was] determined and firing commenced [on the enemy artillery batteries], it could observe and report upon the effect of the fire."[21]

Foulois also saw a nascent ability for aircraft to affect the battlefield through direct attacks on enemy forces. He observed that "effective fire, if of sufficient strength and at all accurate, delivered from such a position as could be occupied by an aerial fleet will undoubtedly have considerable effect on the morale of troops, if they are without sufficient overhead protection."[22] Thus, he became the first American airpower theorist to subscribe to the idea of using morale bombing to directly attack the enemy's will. This combination of superior knowledge of the enemy's positions and direct attacks against them would grant the attacker a decisive advantage, and "unless the enemy is vastly superior in numbers, equipment and morale, the aerial victory should be an important factor in bringing campaigns to a short and decisive end."[23]

To accomplish these effects, however, Foulois noted that a commander's aerial fleet must have the unrestricted use of the skies over the battlefield. Therefore, he predicted, "In the future we can expect to see engagements in the air between hostile aerial fleets. The struggle for supremacy in the air will undoubtedly take place while the opposing forces are maneuvering for position, and *before* the opposing cavalry forces have even gained contact (emphasis added)."[24] Once the aerial fleet gains superiority over the enemy's positions, "the enemy will be unable to prevent aerial reconnaissance for the purpose of obtaining the desired information," and the battle should come to a swift and decisive end.[25]

Although a majority of his thesis combined informed conjecture and outright speculation, Foulois foresaw most of the uses of aviation in World War I. He submitted his thesis to the Army Signal School on 1 December 1907, and the faculty forwarded the paper to the chief signal officer at the War Department for review. Foulois's thesis arrived at a fortuitous time, as the Signal Corps was in the process of establishing an air force and needed officers to participate in a newly formed aeronautical board charged with conducting aircraft trials for the War Department. But first, the War Department needed to procure an aeroplane.

The War Department Buys an Aeroplane

While Foulois was fighting in the Philippines and attending school at Fort Leavenworth, the War Department was beginning to show an interest in aviation. On 18 January 1905, the Wright brothers wrote their congressional representative, the Honorable R. M. Nevin, and touted the accomplishments of their "production of a flying machine of a type fitted for practical use."[26] They suggested that the aeroplane could be "of great practical use in various ways, one of which is that of scouting and carrying messages in time of war" and asked Nevin if he could "ascertain [if] this is a subject of interest to our government."[27] Nevin then wrote the secretary of war concerning the Wright brothers' invention and Maj Gen G. L. Gillespie, the president of the Board of Ordnance and Fortification, replied to Nevin on 24 January 1905. In his letter, Gillespie stated that "the Board has found it necessary to decline to make allotments" for experimental aircraft, and "it appears . . . that [the Wright brothers'] machine has not been brought to the stage of practical operation."[28] Gillespie's skepticism about the Wright brothers' accomplishments and his unwillingness to provide funds for development stem from the board's previous $50,000 investment in the aviation experiments of Dr. Samuel Langley. Langley repeatedly failed to produce a powered flying machine; the resulting "Congressional and editorial attacks had the effect of making the members of the Board extremely cautious toward another proposal for an aeronautical device."[29]

Undaunted, the Wright brothers tried again in October 1905, writing directly to the secretary of war and offering an aeroplane that could fly "at least twenty-five miles at a speed of not less than thirty miles an hour."[30] They received a reply two weeks later from the board, again declining to fund their efforts and using almost the exact language as the first rejection letter. Finally, in the spring of 1907, the Aero Club of America brought the efforts of the Wright brothers to the attention of Pres. Theodore Roosevelt, who then directed the secretary of war and the board to begin "experimentation with the Wright machine."[31]

After months of subsequent correspondence between the Wright brothers and the board concerning the composition and requirements for the War Department's request for proposals,

the board published Specification Number 486 on 23 December 1907. The specification required any aeroplane offered to the War Department to be transportable in standard Army wagons, carry 350 pounds over 125 miles, and attain a speed of at least 40 miles per hour over a closed course. Additionally, any bid must include the instruction of two men in the "handling and operation" of the flying machine at no extra charge to the government.[32]

When the deadline for contract proposals passed on 1 February 1908, the War Department had received only three bids. Of those, the War Department deemed only the Wright brothers to have a realistic chance of meeting the requirements. Later that month the parties agreed on a contract for one aeroplane and the training of two pilots.[33] The Signal Corps, realizing that a new organization would be required to handle the administration of the contract and the testing of the new machines, created the Aeronautical Division on 1 August 1907. The Aeronautical Division, as stated in the chief signal officer's memorandum, "will have charge of all matters pertaining to military ballooning, air machines, and all kindred subjects."[34]

Foulois Joins Army Aviation

After Foulois's Signal School thesis arrived at the Office of the Chief Signal Officer, the Signal Corps selected him to serve on the newly formed Aeronautical Board to assist in the administration of dirigible and aeroplane qualification tests. Upon his graduation from the school in July 1908, he received orders to Washington, DC, reporting for aviation duty in the Office of the Chief Signal Officer.[35] The foundations of Army aviation were now in place; it had a home in the Aeronautical Division and with Foulois and other prospective aviators, and it would soon have its first aeroplane.

However, Foulois's first encounter with the aeroplane would have to wait. In July and August 1908, Foulois became one of the first three Army aviators when he participated in the acceptance trials of the War Department's first airship built by Glenn Curtiss and Thomas Baldwin.[36] The dirigible passed the War Department's tests, and Curtiss instructed Lieutenants Foulois, Frank Lahm, and Thomas Selfridge on the airship's

operation. Foulois left his first experience with aviation decidedly unenthusiastic about the utility of dirigibles, noting their clumsy handling and poor performance in windy conditions.[37]

While Foulois's group was conducting the tests on Dirigible Number One in August, the Wright brothers arrived in Washington, DC, with their Wright Flyer Model A Number One and began assembling it in preparation for its acceptance trials. Foulois was anxious to fly the new aeroplane, but on 8 September, the Aviation Division ordered him to take Dirigible Number One to the Missouri State Fair for a series of exhibition flights and to show off the War Department's newest acquisition.[38] While Foulois was there, the Wright brothers made several flights with both Lahm and Selfridge, who became the Army's first two heavier-than-air aviators. The trials ended in tragedy when one of the propellers on Wright Flyer Number One broke during an acceptance flight and the aircraft crashed, killing Lieutenant Selfridge and severely injuring Orville Wright.[39] The Wrights returned to Dayton, Ohio, with the wreckage and vowed to fulfill their contract by returning the following year with an improved version of the Flyer.

After the crash of the Wright Flyer, Foulois and Lahm stored Dirigible Number One for the winter. In May 1909, they pulled the dirigible from storage and moved it to Fort Omaha, Nebraska, where they began training three new pilots in the use of the airship.[40] Upon Foulois's recall to Washington, DC, in June to commence the acceptance trials of the newly repaired Wright Flyer, the War Department's General Staff asked him to give his opinions about the military usefulness of the dirigible. Based on his thesis research, his experiences with Dirigible Number One, and intelligence reports on the use of airships by the European powers, Foulois bluntly stated that the aeroplane handily outperformed the dirigible and recommended that the War Department cease procurement of more airships.[41] However, he was unaware that his opinions ran counter to those of the chief signal officer and his staff, and this disagreement would come back to haunt him later that summer.

The Wright brothers returned to Washington, DC, in June 1909 and spent a month assembling and preparing the improved Wright Flyer for its acceptance trials. Foulois observed the Wright brothers throughout the assembly process and

constantly pestered them with questions about theories of aeronautics that he was reading about. Eventually, Wilbur Wright told Foulois to throw away his books, "go over there, and get your hands on that machine with Charlie Taylor, our mechanic."[42] Thus, Foulois learned that practical, hands-on experience was more important to success in the operational end of aviation than questionable theories about aeronautics that lacked empirical evidence.

On 27 July 1909, Orville Wright and Frank Lahm conducted an endurance flight that began the acceptance trials for the Wright Flyer, which remained aloft for one hour, 12 minutes, and 40 seconds, well over the one-hour requirement of Specification Number 486.[43] After laying the trial course for the speed test over five miles of broken country between Fort Meyer and the town of Alexandria, Foulois finally got his chance to fly in the Wrights' aeroplane. His short height, light weight, and map-reading ability made him the perfect navigator-observer for the cross-country trip. The only instruments he took with him on the flight were a barometer to measure height, a box compass for direction, two stopwatches for the two legs of the flight, and a map of the area.[44] Foulois's first flight in an aeroplane occurred on 30 July 1909, where he and Orville achieved a top altitude of 400 feet (a world record) and an average speed of 42.583 miles per hour over the five-mile course.[45] Foulois reveled in his newfound freedom in the air; he later remarked that while "taking in the landscape we were passing over . . . I had no idea there were so many trees and so much rough country in the world."[46] The Flyer's average speed exceeded the contract speed of 40 miles per hour, and the War Department took delivery of its first aeroplane on 2 August 1909 for the sum of $30,000 ($25,000 for the aeroplane and an extra $5,000 for exceeding the contract speed by two miles per hour).[47]

After the War Department's acceptance of the Wright Flyer, the Wright brothers began to train two Army pilots. Foulois, however, was not one of them. Instead, the Signal Corps sent him as the official American delegate to the International Congress of Aeronautics in France from September to October 1909.[48] Unfortunately, Foulois could not protest his removal as one of the two initial pilot trainees since his extensive aviation experience made him the General Staff's natural choice for the

trip. After his return from Europe, Foulois learned from a member of the Signal Office, "over a little liquid refreshment," that his exile to France and denial of flight training was a veiled reprimand for his opinions on the dirigible that were "180 degrees away from the prevailing opinion among the staff members of the Signal Office."[49]

While Foulois was in France, Lt Frank Lahm and Lt Frederic Humphreys completed their flying training with the Wright brothers, soloing in October 1909. Upon his return from the Congress, Foulois began his flight training gratis from the Wrights, as the original contract only paid for the training of two pilots, and he received 54 minutes of student flight time.[50] However, before he could solo, Lahm and Humphreys crashed the Flyer on 4 November, ending the flying season for 1909. Soon after the Wright brothers packed up and departed for Dayton, the War Department reassigned both Lahm and Humphreys to nonflying assignments, leaving America's air force to end the year 1909 with eight enlisted mechanics, one broken aeroplane, and one untrained pilot.[51]

" . . . and Teach Yourself to Fly"

In December 1909, Brig Gen James Allen, chief signal officer, summoned Foulois to his office and told him to take Flyer Number One and its maintenance crew to Fort Sam Houston in San Antonio, Texas. The Flyer was simply too fragile to operate in the harsh wintry winds of Washington, and the lack of winter flying clothes would have made flight operations even more hazardous (not to mention painful) for the untrained pilot.[52] Allen's orders to Foulois were simple: "You are to evaluate the airplane. Just take plenty of spare parts and teach yourself to fly." With that, Foulois's crew disassembled Flyer Number One, packed it into crates, and traveled to San Antonio with an intermediate stop in Chicago to display the Flyer at the Chicago Electrical Trade Exhibition.[53]

From January 1910 until March 1911, Lieutenant Foulois was the only active pilot in the US Army and had an annual maintenance budget of just $150. In comparison, during that same period the French military took delivery of 151 aircraft while the French government provided aircraft manufacturers

over 1.3 million francs (approximately $230,000) in subsidies.[54] After arriving in San Antonio at the beginning of February, Foulois spent several weeks assembling and repairing the Flyer and constructing a hangar to house it. On 2 March 1910, he made his first four flights in the aircraft, which perforce were all solo flights. Foulois achieved four personal firsts that day: his first takeoff, his first landing, his first solo flight, and—on the last flight—his first crash.[55] After much trial and error, many repairs, and constant correspondence with the Wright brothers in Dayton, Foulois became a proficient aviator. Along the way, he also made many modifications to the Flyer, including the addition of a seat belt, wheeled landing gear, and improvements to the steel wires and cables on the aircraft.[56]

Foulois's flying lessons were hard on the fragile aircraft, and he rapidly exhausted the maintenance funds the Signal Corps allotted him for the year. In March 1910, the Signal Corps ordered him to stand down for three months until the beginning of the new fiscal year (FY) after it discovered that he had spent over $300 of his own money to keep the aircraft in the air.[57] Foulois spent the rest of 1910 and the first half of 1911 continuing to hone his flying skills, and he participated in several local exercises. He also designed, built, and tested the first airborne radio set and used it to relay messages during his reconnaissance missions for the exercises.[58]

In March 1911, after three years of turning down the Signal Corps's requests for aviation funding, Congress finally allocated $125,000 for the Aeronautical Division. Allen immediately purchased five additional airplanes from the Wright brothers and Curtiss Aviation. One Wright Flyer B and one Curtiss airplane arrived in Texas in April 1911. In January 1911, the Army selected three new pilots, Lieutenants Paul Beck, George Kelly, and John Walker, from 30 applicants. They arrived in San Antonio in April to begin instruction on the new airplanes.[59]

Training proceeded normally for the three new aviators until 10 May, when, on his first solo flight, Kelly failed to level off in time while attempting to land, crashed the airplane, and flew over 100 feet through the air. He died hours later, and the commander of Fort Sam Houston suspended all further flying at the post. Soon afterward, the War Department established a

flying school at College Park, Maryland, and the flying detachment packed up its aircraft and departed Texas in June.[60]

Foulois, however, did not join them. In July 1911, he reluctantly returned to the War Department for a tour of duty in the Division of Militia Affairs.[61] Nonetheless, he was able to remain a part of Army aviation. Throughout the spring of 1912, he continued his experiments in airborne telegraphy, making many improvements to the range and quality of air-to-ground transmissions. That summer, he flew several reconnaissance missions in support of Army field exercises in Connecticut and proved the veracity of his Signal School thesis by "furnishing the Commanding General . . . with information enabling him to so dispose of the troops as to win the problem by preventing the opposing troops from attaining their objective."[62]

In October 1912, after four years of detached aviation duty, federal law required Foulois to quit aviation and rejoin the 7th Infantry at Fort Leavenworth. In February 1913, the chief signal officer asked Foulois to provide comments to Congress on a proposal to remove Army aviation from the Signal Corps and reestablish it as an aviation corps directly under the War Department. Foulois, along with other aviators such as Capt William Mitchell and Lt Henry Arnold, unanimously opposed the measure. Instead, they asked for more money, men, and airplanes while declaring that Army aviation should remain under the Signal Corps until, in the words of Arnold, aviation could "take care of itself."[63] Foulois also recommended that Army aviation remain under the command of a nonflyer until "aviators learned more about flying and could actually qualify as having special skill and ability in military aviation."[64]

Analysis

Foulois's experiences in the Philippines and Cuba provide great insight into what kind of leader he would eventually become in World War I and beyond. He showed personal courage on many occasions, earning a field promotion to sergeant on the island of Cebu after facing off against an insurgent, killing him, and escaping without injury.[65] Later, he solidified his alliance with the Moro leader Dato Piang by diving into a fast-moving river and risking his own life to save the chief's son

from drowning.[66] The son, Datu Gumbay Piang, went on to lead a guerrilla force of 20,000 against the Japanese occupation, pledging to Secretary of War Henry Stimson that he would "die for America and their country" if necessary.[67] This personal courage would serve Foulois well throughout his career, both in risking his life on a daily basis flying unproven and unreliable aircraft and jeopardizing his career multiple times through his advocacy of aviation—often in opposition to the views of his superiors, the War Department's General Staff, and Congress.

Foulois also made a habit of asking for challenging assignments, regardless of their importance or visibility. In 1901 he volunteered for quartermaster sergeant and first sergeant duties in his unit after the three more senior noncommissioned officers ahead of him turned down the jobs and their responsibilities.[68] Later, Foulois would fight to have his fledgling aviation unit included in Army field exercises, both to hone his flying skills and to prove the utility of heavier-than-air aviation to the War Department.[69] This desire to tackle the difficult jobs, regardless of recognition or reward, would remain with Foulois throughout World War I and beyond.

Through his preaviation experiences overseas and at Fort Leavenworth, Foulois began compiling an extensive network of acquaintances and friends with whom he would work many times over the following decades. He first met John Pershing while a lieutenant in the Philippines and later worked for him again in both the 1916 Mexican Expedition and World War I. In Cuba he met and worked for Mason Patrick, who would eventually replace him as chief of Air Service in France. Foulois also became friends with a young Capt Douglas MacArthur, whom Foulois knew from both his schooling at Fort Leavenworth and his early flying days at Fort Sam Houston. Years later MacArthur would come to Foulois's aid during his tenure as chief of the Army Air Corps. Foulois described how "MacArthur alone, as chief of staff of the Army, stood between me and my . . . enemies in their continuous but unsuccessful attempts to lift my official scalp."[70]

Foulois's aviation career really began with his Signal School thesis, in which he laid down several ideas on the future uses of airpower. One major prediction he later abandoned was that the balloon will "be used more or less as a fighting machine" due to its high weight capacity and long loiter time, in contrast

to the airplane that "will probably never be used extensively as a fighting machine, due to its limited weight carrying capacity."[71] After performing the acceptance trials for Dirigible Number One, however, he came to the opposite conclusion, noting that the balloon's highly flammable gasbag, combined with its vulnerability to windy conditions, made it inferior to the rapidly improving airplane. However, whether meant for dirigibles or airplanes, many of the other assertions Foulois made in his thesis remained valid.

Foulois's Signal School thesis provides a unique look into early airpower thought because of not only what is in the thesis but also what is missing. Nowhere in the document is any reference made to strategic bombing or any kind of aerial attacks that do not directly involve ground troops. Foulois focuses exclusively on what aviation can provide the ground commander, including reconnaissance, artillery spotting, and direct attacks against the opposing army. This is most likely due to the primitive state of aviation in 1907, but he does hint at the possibility of long-range bombing in the future, stating, "Our geographical position with respect to Europe has saved us from numerous difficulties in the past, but it is hardly possible that we can expect to be unmolested in the future, with such means of transport and communication as are available at the present day."[72] His focus on the airplane as support for the ground army continued until World War I, when he encountered Hugh Trenchard of the Royal Flying Corps and became fascinated with his views on strategic bombing.[73]

Another key lesson Foulois learned while working with the Wright brothers and learning to fly at Fort Sam Houston was the critical roles that maintenance and logistics play in keeping an aviation unit in the air. The Wright brothers showed him that hands-on experience with an airplane, especially the servicing and repair of the engine, more thoroughly prepared a pilot for flying than theoretical knowledge gleaned from a textbook. He learned this lesson well and, when not flying, spent most of his time at Fort Sam Houston interacting with the mechanics and learning how to maintain and repair his Wright Flyer. He would put this knowledge to good use when solving the safety problems that initially plagued the San Diego flight school and then organizing the Air Service in France during World War I.

During one of his many testimonies to Congress, Foulois confirmed his belief by commenting that "approximately 90 percent of all Air Service work is performed on the ground and the remaining 10 percent is carried on in the air. . . . This 90 percent of work on the ground involves duties and responsibilities (mechanical, technical, and financial) which can only be efficiently performed by personnel of long practical experience."[74]

During his early experiences as an infantryman and engineer serving in the Philippines and Cuba, Foulois exhibited both immense personal courage and a willingness to take on difficult tasks regardless of their prestige. As one of the military's first aviators, he learned that practical experience often trumps theoretical knowledge and lack of a robust depot and maintenance organization can severely hamper aviation operations. These lessons would serve him well as he took Army aviation into combat for the first time during the 1916 Mexican Punitive Expedition and again as he was tasked with organizing the massive expansion of the War Department's meager air forces after America's decision to enter World War I.

Notes

1. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 7–9.
2. Ibid., 10–11.
3. Pugh to Headquarters USAF, memorandum. During his entire first enlistment, Foulois asked everyone to call him Ben. No one asked him about the origin of his nickname, and he never volunteered the information.
4. Ibid.
5. Foulois, "Early Flying Experiences," 18.
6. Pugh to Headquarters USAF, memorandum.
7. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 24.
8. Ibid., 25.
9. Ibid., 30.
10. Foulois, "Early Flying Experiences," 19.
11. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 31.
12. Shiner, "Benjamin D. Foulois," 12.
13. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 42.
14. Pugh to Headquarters USAF, memorandum.
15. Foulois to Bullard, memorandum, 3.
16. Foulois, graduating thesis, Army Signal School, 1.
17. Ibid.

18. At the time, airship advocates in the Army and Navy noted that the airship's superior endurance made it a better reconnaissance platform than the airplane.
19. Foulois, graduating thesis, Army Signal School, 7.
20. Ibid., 6.
21. Ibid., 9.
22. Ibid., 3.
23. Ibid.
24. Ibid.
25. Ibid., 5.
26. Wright to Nevin, letter.
27. Ibid.
28. Gillespie to Nevin, letter.
29. Chandler, *How Our Army Grew Wings*, 145.
30. Wright to secretary of war, letter.
31. Bell to Parsons, letter.
32. Allen, "Signal Corps Specification, No. 486."
33. Goldberg, *History of the United States Air Force*, 3.
34. Allen, "Office Memorandum No. 6."
35. Shiner, "Benjamin D. Foulois," 12.
36. Chandler, *How Our Army Grew Wings*, 116.
37. Shiner, "Benjamin D. Foulois," 12.
38. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 54.
39. Goldberg, *History of the United States Air Force*, 4.
40. Chandler, *How Our Army Grew Wings*, 103.
41. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 59.
42. Albert F. Simpson Historical Research Center (AFSHRC), "U.S. Air Force Oral History Interview 766," 14.
43. Allen, "Proceedings of the Board of Officers."
44. Foulois with Glines, *From the Wright Brothers to the Astronauts,* 63–64.
45. Allen, "Proceedings of the Board of Officers."
46. "Victory for Wright."
47. Squier to the Board of Ordnance and Fortification, letter.
48. Foulois to Bullard, memorandum, 3.
49. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 67.
50. AFSHRC, "Oral History Interview 766," 15.
51. Ibid., 16.
52. Goldberg, *History of the United States Air Force*, 4.
53. Chandler, *How Our Army Grew Wings*, 180.
54. Morrow, *Great War in the Air*, 16.
55. AFSHRC, "Oral History Interview 766," 16.
56. Foulois to Bullard, memorandum, 4.
57. Ibid.
58. Ibid.
59. Goldberg, *History of the United States Air Force*, 6.
60. Chandler, *How Our Army Grew Wings*, 190–91.
61. Soulliere, "Statement of Military Service."

62. Foulois to Bullard, memorandum, 4.
63. Hinton, *Air Victory*, 12.
64. Historical Division, *Organization of Military Aeronautics, 10.*
65. Foulois, "Early Flying Experiences," 18.
66. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 30.
67. "Americans Make First Substantial Gains on Bataan."
68. Foulois, "Early Flying Experiences," 18.
69. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 79.
70. Ibid., 82.
71. Foulois, graduating thesis, Army Signal School, 2.
72. Ibid., 10.
73. Copp, *Few Great Captains*, 20.
74. House Committee, *Hearings*, vol. 2, 487.

Chapter 3

Organizing and Funding an Air Force (1914–17)

Over the next three years, Foulois experienced a meteoric rise from junior staff officer in the Office of Militia Affairs to the brigadier general handpicked by General Pershing to be the chief of Air Service for the American Expeditionary Forces in France. How did Foulois translate his experiences as the Army's first commander of a combat flying squadron into a concrete plan for establishing, equipping, and staffing America's first air expeditionary force? An examination of his actions in solving safety problems at the Signal Corps's flying school, his performance as the commander of the 1st Aero Squadron in the Mexican Punitive Expedition, and his role in the buildup of Army aviation after the declaration of war in 1917 provides excellent insight into Foulois's leadership style, organizational skills, and political shrewdness.

Fixing the Schoolhouse and Establishing the 1st Aero Squadron

In January 1913, while Foulois was serving in the Division of Militia Affairs, the Signal Corps established its first flying school on North Island, near San Diego, California.[1] By the end of the year, the school had compiled an extremely poor safety record. Of the 24 airplanes that the Signal Corps had bought since 1908, its pilots had damaged nine of them beyond repair, with seven of the losses occurring in 1913. Additionally, the Signal Corps had 12 fatal accidents between 1908 and 1913, with seven fatalities at the flying school in its first year of operation.[2]

This string of fatal accidents during the flying school's first year resulted in much bad press for the Aviation Division and generated significant criticism from the War Department of Army aviation in general. In the fall of 1913, Maj Samuel Reber, the incoming head of the Aviation Division, asked Foulois to return to aviation duty and report to Capt Arthur Cowan,

commandant of the flying school, as a troubleshooter to assist in solving endemic problems with the school's training, organization, and equipment. Foulois leapt at the chance to return to flying and reported to Captain Cowan at North Island in December 1913.[3]

Upon Foulois's arrival at North Island, Cowan gave him free rein to make changes to the school as he saw fit, knowing that Foulois had Reber's full backing and support. After observing flight operations for two weeks, Foulois made his first changes to school policy. First, noting that the pilots' "susceptibility to newspaper praise or criticism, or the desire to obtain newspaper notoriety . . . has contributed indirectly to the death of a number of our best . . . aviators," Foulois issued a new General Order Number One, prohibiting the dissemination of "any information concerning the work of the school."[4] During the early days of aviation, Foulois had seen many popular civilian aviators succumb to the stresses they imposed on themselves due to the expectations of the press for grander and more dangerous aerial stunts, and he did not want his pilots to suffer the same fate. Second, after determining that the two main causes of the fatal accidents at the school were skull fractures and drowning, Foulois implemented General Order Number Two, making the use of helmets and life preservers mandatory for all pilots.[5]

Foulois made many other modifications to the school and its curriculum over the following months. After seeing that the school's pilots spent their free time playing polo in lieu of performing preflight checks of their aircraft, he procured several dozen sets of mechanics' coveralls and ordered all pilots to the workshops to learn the basics of aircraft maintenance and repair from the enlisted mechanics.[6] Always one to pitch in and get his hands dirty, Foulois personally taught a course on aircraft engine overhaul and repair.[7] These improvements dramatically reduced the school's accident rate and earned him a promotion to captain on 23 July 1914.[8] During the second half of 1914, Foulois oversaw the design and construction of the first truck-based portable field machine shop, which proved its worth in the Mexican Punitive Expedition and set the standard for the Air Service throughout World War I.[9]

After Foulois fixed the flying school's training program and placed it on a path to success, the Aviation Division ordered

him to remain at North Island to establish and command the Army's first operational aviation unit, the 1st Aero Squadron. The squadron stood up under the command of Captain Foulois in September 1914 and initially was comprised of 16 officers, 67 enlisted men, and eight new Curtiss J airplanes.[10] While the Signal Corps considered the 1st Aero Squadron to be an operational Army unit, in reality the squadron was woefully unprepared for the rigors of field conditions. To help prepare the squadron for possible deployments, Foulois decided to enter the squadron's aircraft in the December 1914 Mackay Trophy competition, held in Los Angeles. His plan was to fly six airplanes from North Island to Los Angeles, participate in the contest's troop reconnaissance problem, and fly back to North Island. However, both the pilots and aircraft were insufficiently prepared for even such a short cross-country flight, resulting in five of the six aircraft crashing, with one fatality and the total loss of three airplanes.[11] The sixth airplane, piloted by Capt Townsend Dodd and Lt Shepler Fitzgerald, won the trophy by default as it was the only entry to provide the judges with "a comprehensive and accurate report of the composition and location of the troops."[12]

The failure of the 1st Aero Squadron—which represented the entirety of the Army's tactical aviation strength—to complete even a short cross-country flight without loss of life helped to convince the Signal Corps of the need for more funding, men, and airplanes. In March 1915, the Signal Corps requested for FY 1916 the unheard of amount of $1 million for aviation, which the secretary of war subsequently reduced to $400,000. In the end, Congress cut the amount to $300,000, much less than the requested amount, but still an increase over the $250,000 budget of FY 1915.[13] For comparison, in that same year Germany appropriated $45 million for aviation; Russia, $22.5 million; and France, $12.8 million.[14]

After the disastrous Mackay Trophy deployment, Foulois and the 1st Aero Squadron spent most of the following year improving their basic flying skills and experimenting with new uses for the airplane in support of the Army. In May and June 1915, the squadron received eight new Curtiss JN-2 aircraft that represented the latest in American aeronautical development. In July the Army ordered Foulois's squadron to Fort Sill, Oklahoma,

to participate in artillery spotting exercises, marking the "first effort made in the United States Army toward the combined use of artillery and aviation."[15] The deployment, however, was plagued with maintenance problems as Foulois and his squadron tried to repair the defects in the new Curtiss airplanes. For example, Foulois's mechanics condemned six of the 12 engines that the Curtiss Company delivered to the squadron before its departure because they failed their acceptance tests.[16] The 1st Aero Squadron would continue to suffer with poorly constructed airplanes and substandard replacement parts through the Mexican Punitive Expedition and into World War I.

In November 1915, the 1st Aero Squadron traveled with its six remaining JN-3s (two JN-2s were lost in crashes, and the Curtiss Company modified the remainder to the JN-3 configuration) to Fort Sam Houston to set up permanent operations.[17] While establishing the squadron in San Antonio, Foulois began to have difficulty taking care of his pilots, who were suffering from unexplained medical problems. In response, he secured the services of Dr. Ralph Greene, a surgeon in the Florida National Guard who was also in charge of the Florida State Hospital for the Insane, and tasked him with diagnosing the pilots' ailments.[18] Greene flew often with the squadron and studied the effects of the cold, thin atmosphere on both himself and the pilots, thus becoming the Army's first flight surgeon for a heavier-than-air flying unit.[19]

First Combat—The Mexican Punitive Expedition of 1916

On 9 March 1916, Francisco "Pancho" Villa, a notorious revolutionary fighting against the Carranza government in northern Mexico, raided the town of Columbus, New Mexico, killing 17 Americans. The US government responded by ordering Brig Gen John Pershing to take a force of 15,000 troops into Mexico to capture Villa dead or alive.[20] On 12 March, the Army ordered Foulois and the 1st Aero Squadron to deploy to Columbus in support of Pershing's expedition. Foulois had his squadron packed for transport within four hours of receiving his orders, and the squadron's eight JN-3 aircraft, 11 officers, 82 enlisted men, and one civilian

mechanic departed for Columbus on 13 March and arrived on 15 March.[21] This represented only half of the squadron's full authorized complement of 20 pilots, but the Signal Corps simply had no other veteran aviators to assign to Foulois before his departure for Mexico.[22]

Unfortunately, neither the Army nor the 1st Aero Squadron knew what the unit's duties would be upon arrival in New Mexico. As Foulois later remarked, "We went down there to perform a service we knew nothing about, with no maps and with no knowledge of the situation whatsoever."[23] Actually, the squadron did have one map of the area, made by the Mexican Central Railroad almost 30 years prior, and it would be nearly 10 days before the Corps of Engineers could provide the squadron with more appropriate and timely maps of the area.[24] Undeterred by a lack of further instructions from the War Department or adequate maps of the area, Foulois personally flew the first reconnaissance flight into Mexico with Dodd (the 1914 Mackay Trophy winner) on 16 March and confirmed for Pershing that there were no Mexican rebel troops within a day's march of the expedition's formations.[25] Foulois chose himself for the observer position both because of the danger of flying cross-country into an unknown ground situation and the fact that he was the only member of the squadron who had previous surveying and mapping experience.[26]

On 19 March Pershing's headquarters ordered the squadron to the town of Casas Grandes, 125 miles south of the United States–Mexico border. Foulois led the squadron's eight planes in a cross-country flight to Casas Grandes that afternoon, but only four planes remained in the formation when darkness forced the squadron to stop overnight at La Ascencion. One plane returned to Columbus with mechanical trouble, while three other aircraft lost sight of the formation and landed in darkness with one plane damaged beyond repair. The next day, the remaining aircraft landed in Casas Grandes and promptly performed their first reconnaissance mission over the Sierra Madre Mountains. Unfortunately, the JN-3s were unable to pass through the 10,000-foot mountains due to high winds and the aircraft's ceiling limitations, and they returned to Casas Grandes empty handed. Adding insult to injury, one of the

airplanes crashed on landing because of high winds, injuring its pilot and damaging the airplane beyond repair.[27]

Undaunted by these early failures, Pershing and Foulois changed the squadron's primary mission from reconnaissance to performing courier duty between the headquarters and the expedition's forward units. From 26 March to 4 April, the squadron flew 79 missions carrying dispatches from Pershing and mail from the United States to regular Army units. Meanwhile, Pershing submitted on Foulois's behalf a request for $500,000 to Secretary of War Newton Baker to purchase additional airplanes and aeronautical equipment, which Congress approved on 31 March.[28] Foulois's problems with the JN-3 continued when another airplane crashed on landing on 6 April, damaging it beyond repair.[29]

For Foulois, the most interesting mission of the expedition occurred on 7 April 1916. Pershing's headquarters dispatched two airplanes and four pilots, including Foulois, to Chihuahua City with dispatches for the American consul, Marion Letcher, requesting additional supplies for several regular Army units nearby. After Foulois landed outside the town, an unruly mob of locals attempted to surround his airplane, and he directed the pilot to take off and leave him there. The local authorities promptly arrested Foulois on unspecified charges and took him to the city jail. After several hours in jail, Foulois successfully contacted the military governor of Chihuahua and secured his release. Foulois spent the rest of the day with Letcher, who shipped two truckloads of supplies to the Army troops that evening.[30] Foulois's efforts brought relief to the beleaguered troops subsisting off the land, and in the process he became the first American aviator detained by a foreign government.[31]

Throughout the remainder of April, the squadron continued to perform valuable reconnaissance and courier duties for Pershing but continued to lose aircraft at an alarming rate. During this period, the squadron began its first experiments with photo-reconnaissance using a Brock automatic camera able to photograph terrain continuously and create strip maps.[32] On 20 April Pershing ordered Foulois and his two remaining operational aircraft to return to Columbus to take possession of 12 newly purchased Curtiss R-2s, complete with machine guns, bomb racks, and radios. Shortly after his arrival in Columbus,

however, Foulois found out that the Signal Corps had instead given him four new Curtiss N-8s that turned out to be the export version of the underpowered JN-3s the squadron was currently flying. Foulois notes in his Report of Operations, "Practical tests in flight with these machines demonstrated their unsuitability for Mexican field service, and they were declared unsuitable for such service."[33] He subsequently registered a strong objection to the airplanes with Maj Gen Frederick Funston, commander of the Army's Southern Department, who agreed with Foulois and forwarded his concerns to Baker. Baker also agreed but stated that the N-8s were the only aircraft immediately available and that Foulois would receive improved aircraft as soon as possible.[34]

Baker made good on his promise, and on 1 May two new Curtiss R-2s arrived in Columbus with 10 more delivered over the next month. The R-2s, while superior to the N-8s, arrived with a host of mechanical and manufacturing deficiencies; the squadron spent the months of June and July modifying the aircraft to survive field conditions in the Southwest. Two of the major deficiencies with the aircraft were the engine and the propeller. The engine was an experimental type that the Curtiss Company had never tested in the field, forcing the squadron's mechanics to modify them to make them perform adequately at their high-altitude aerodromes. In addition, Curtiss did not design the propellers for a hot, dry climate, and they began delaminating almost immediately upon arrival in Columbus. As a result, the squadron developed a method for manufacturing its own propellers on site. American aircraft companies later used those techniques for all future wood propellers.[35]

The 1st Aero Squadron's role in the Mexican Punitive Expedition ended on 15 August 1916 with its redeployment to Fort Sam Houston. In the five months of combat operations in New Mexico and Mexico, the squadron completed 540 flights for General Pershing, covering 19,553 miles and performing 345 hours, 43 minutes of reconnaissance and courier work. Though the squadron lost eight aircraft, it suffered only minor injuries and no fatalities.[36] However, the squadron's limited effectiveness served as a wake-up call to the sorry state of Army aviation, which Pershing eloquently summarized in his memoirs:

> In looking back over the period immediately prior to our entry into the war, the very primitive state of our aviation still gives me a feeling of humiliation. The Punitive Expedition of 1916 went into Mexico with eight of the thirteen antiquated tactical planes which constituted our all in aviation. In a country almost uninhabited, save for a few villages scattered here and there, where the difficulties of obtaining information were almost insurmountable, a well-trained, up-to-date fleet of airplanes would have been invaluable. These old planes were not in any sense properly equipped as compared with those being used by other nations even then. . . . Yet the services of our aviators in Mexico stood out strongly as an indication of what American fliers were to accomplish in the World War.[37]

In September 1916, after completing his tour as commander of the 1st Aero Squadron, Foulois reported to San Antonio for duty as the aeronautical officer for the Southern Department.[38] While he was working at Fort Sam Houston, the War Department and Congress became increasingly aware of American aviation's poor state of preparedness, evidenced by the 1st Aero Squadron's limited effectiveness during the Mexican Punitive Expedition. Thus, the War Department and Congress increased the FY 1917 aviation budget from the initial April 1916 request of $1.2 million to $13.9 million, which the president signed into law on 29 August 1916.[39] This 11-fold increase in aviation funding included $600,000 for the purchase of additional training fields; Foulois surveyed the San Antonio area and established the first of these new aerodromes, which the War Department named Camp Kelly after Lt George Kelly, the first aviation fatality at Fort Sam Houston.[40] The War Department also authorized the expansion of the newly renamed Aviation Section from one squadron to seven aero squadrons of 12 aircraft each. Unfortunately, while Army aviation now had the money to fund its expansion, the American aviation industry could not meet the Army's needs for improved airframes and engines. By 1917, only one of the seven squadrons had its full complement of airplanes.[41]

Undaunted, Brig Gen George Scriven, chief signal officer, submitted a $16.6 million budget request for FY 1918, an increase of $2.3 million over the previous year's Signal Corps budget. When Congress questioned Scriven about the reasons for the increase, he explained that the budget for the Signal Corps proper was only about $1 million, an amount virtually

unchanged from the previous year, while the other $15.6 million was earmarked for aviation.[42] Congress later reduced this amount, and on 12 May 1917, the Aviation Section received a total of $10.8 million for FY 1918.[43] While the Aviation Section was taking these first tentative steps toward funding and expanding America's air forces, it was also making grander plans in anticipation of America's entry into World War I.

America Enters the War and Purchases an Air Force

In March 1917, Maj Gen James Squier, the new chief signal officer, recalled Foulois to Washington for duty in the Aviation Section of the Signal Corps to assist in contingency planning for America's possible entry into the war. On 21 March, Secretary Baker asked the Signal Corps to estimate the aviation requirements for an army made up of regulars, the National Guard, and one million additional volunteers. Foulois's first effort, designed in conjunction with the National Advisory Council on Aeronautics, called for the construction of over 19,000 combat and training airplanes for the Army and Navy. While Squier gave his approval, the War Department's General Staff rejected the program as too large for the Army's needs.[44] Foulois and his staff quickly modified their plans and, on 29 March, replied with an aviation program costing $54,235,000 and calling for the production of over 3,700 airplanes per year.[45] Foulois's plan envisioned a total of 16 aero squadrons and 1,850 pilots, 16 balloon companies and 300 balloonists, and nine aviation schools graduating 650 pilots and 300 balloonists annually.[46] However, the War Department cast aside Foulois's plan soon after Congress's declaration of war against Germany on 6 April 1917, as subsequent requests by America's new allies would require far more aviation resources than anyone in the Aviation Section had previously imagined.

Soon after the United States entered the war, the Army and Navy created the Aircraft Production Board, which quickly became the chief governmental authority on military aeronautics. The board spent the rest of April and the beginning of May attempting to determine the size and composition of the aviation

forces that would be required to support General Pershing's American Expeditionary Forces. However, the board's initial estimates of the size of the required aerial fleet paled in comparison to the 24 May 1917 request by French premier Monsieur Ribot:

> It is desired that in order to cooperate with the French Aeronautics, the American Government should adopt the following program: the formation of a flying corps of 4,500 airplanes—personnel and material included—to be sent to the French front during the campaign of 1918. The total number of pilots, including reserve, should be of 5,000 and 50,000 mechanics.
>
> Two thousand airplanes should be constructed each month as well as 4,000 engines, by the American factories. That is to say, that during the six first months of 1918, 16,500 airplanes (of the latest type) and 50,000 engines will have to be built.
>
> The French Government is anxious to know if the American Government accepts this proposition, which would allow the Allies to win the supremacy of the air.[47]

Ribot, in his telegram, had requested that the United States produce, from a standing start, more aircraft in one year than the French had been able to build in three years of war. Ribot, like most Europeans at the time, assumed that the United States—with its large work force, advanced industry, and plentiful natural resources—could easily convert its industrial base to war materiel production, making it essentially a huge untapped arms factory. In addition, the requested numbers of aircraft were "wholly out of proportion, according to existing ratios of air to ground forces, to infantry troops then contemplated for the AEF."[48]

The Aircraft Production Board, however, took a different view and at the end of May adopted the production goals set down by Ribot. The General Staff subsequently approved the board's plan, which then became the foundation for all American military aviation during the war.[49] Implementation of the board's plan fell on the newly formed Joint Army-Navy Technical Board, headed by Foulois, which focused its attention on standardizing aircraft designs as much as possible to take advantage of mass-production techniques pioneered by the automobile industry.[50] After three days of deliberations, Foulois's joint board approved the "12,000 plane program," calling for America to produce 12,000 airplanes and 24,000 engines for service in

France and another 5,000 training aircraft between 1 January and 30 June 1918. The plan divided the airplanes destined for France into 4,000 reconnaissance and artillery spotting aircraft, 6,667 fighters, and 1,333 bombers.[51] While a good start, Foulois and his Aviation Section group worked for the next month to refine the plan's initial numbers into something that America's aviation industry could quickly implement.

Working through June, Foulois's group labored to establish the number of aircraft required to support the joint board's goal of 12,000 combat aircraft. Extrapolating from his experiences as commander of the 1st Aero Squadron, Foulois and his group calculated the additional airplanes needed for attrition, training, supply, and support for the rapidly expanding Aviation Section. Showing great foresight, Foulois had created a field manual while in the 1st Aero Squadron that outlined all the equipment requirements to keep one aircraft operational. He was able to multiply easily the contents of the manual by the number of aircraft required to determine the support equipment requirements of the massive aerial fleet.[52] Foulois submitted his final plan on 13 June 1917, which called for the production of a staggering 22,625 aircraft of all types and a training program capable of turning out 6,210 pilots by 1 July 1918.[53] As estimated by Foulois, this program would cost the unprecedented sum of $640 million, a far cry from the $150 aviation budget of 10 years before.[54] Soon after Foulois submitted his aviation program, the War Department promoted him to major, a rank he would hold for less than a month.[55]

After presenting the plan to Squier and receiving his approval, Foulois took it to the War College Division of the General Staff, which after weeks of secret deliberation disapproved the entire plan. Foulois, undeterred by the decision, convinced Squier to take the plan directly to Baker, who bypassed the recalcitrant General Staff, approved the plan as written, and forwarded it directly to Congress with the comment that "the aircraft program seems by all means the most effective way in which to exert America's force at once in telling fashion."[56] The legislation spent one week in a House committee, passed on a voice vote in one day on the House floor, and spent one more week in the Senate, which passed it with another voice vote. Pres. Woodrow Wilson signed the legislation on 24 July 1917,

making it the largest amount of money ever appropriated for a single purpose up to that time.[57]

While Army aviation now had its funding, spending it would prove problematic. America's aviation industry on the eve of its entry in the war was wholly inadequate to meet the demands that the War Department would place on it. According to Maj Gen Mason Patrick, Foulois's successor as chief of air service in France, "There were practically no engineers or mechanics in the United States familiar with the intricacies of modern airplane engines."[58] Additionally, because of the rapid turnover in combat models and an obsession with security, America's European allies had not used American aviation companies for the construction of aircraft during the previous three years of war, denying these companies the experience in making modern combat aircraft.[59] America's aviation industry was so limited that in 1916 it was able to deliver only 64 of the 366 airplanes on order from the government.[60]

American military aviation was in equally poor shape. At the time of America's declaration of war, the Aviation Section had only 65 officers, of which 26 were fully qualified pilots, and 1,100 civilian and enlisted personnel. Naval aviation was slightly smaller with 48 officers and only 239 enlisted personnel.[61] Moreover, the Signal Corps had procured only 142 airplanes for the entire period between 1908 and 1917.[62] Of those aircraft, 55 remained in the Aviation Section's inventory in April 1917, and of those 51 were obsolete and the other four obsolescent.[63] As Patrick succinctly states, "The United States had not manufactured, prior to its declaration of war, a single airplane or engine considered fit to cross the lines on the Western front."[64]

"Build a Large Something out of Nothing, and Build It Quickly"

In May 1917, Pershing, impressed with Foulois's performance during the Mexican Punitive Expedition, asked Squier if Foulois could join him in France as his aviation officer. Squier replied that Foulois's talents were required in Washington to plan and execute the Army's aviation buildup for the war and

that Foulois should join Pershing in France in six months.[65] In the meantime, one of Foulois's first tasks was determining what types of aircraft the Army would produce to equip its expanding aviation arm.

On 17 June 1917, the Aircraft Production Board sent Maj Raynal C. Bolling and a group of manufacturing experts and 93 civilian automotive and engine factory experts to Europe to study Allied manufacturing methods and airplane designs.[66] Unfortunately, most foreign aircraft production consisted largely of hand construction, and their design specifications were not exact enough to support mass production techniques.[67] To address these problems, the Bolling mission arranged for European manufacturers to ship sample aircraft and construction blueprints for several types of aircraft to the United States and negotiated with Allied governments for the free exchange of aircraft designs, raw materials, and manufacturing expertise between American and European aviation firms.[68]

One of the most important decisions made by the Bolling mission was to forego the mass production of pursuit aircraft, since their designs changed too rapidly for modern mass production techniques, and concentrate instead on producing the de Havilland DH-4, a two-seat British reconnaissance bomber with the American-designed Liberty engine. Instead of building indigenously designed pursuit aircraft, the American Air Service would instead purchase them from its European allies while encouraging American manufacturers to experiment with producing French and British designs.[69] This approach would allow American manufacturers to apply mass production techniques learned from the automobile industry to aircraft production, resulting in the rapid retooling of factories to develop and build large quantities of an airborne analog to the Model-T automobile. However, the efforts of American manufacturers to produce even this one aircraft were hampered by "the fundamental differences of [an] industrial approach between European serial production by skilled craftsmen and US standardized, assembly-line mass-production techniques using unskilled labor and detailed blueprints and specifications for machinery."[70]

As a reward for his extraordinary efforts since the declaration of war and in recognition of the Aviation Section's shortage

of senior-ranking officers, the War Department promoted Benjamin Foulois to brigadier general on 24 July 1917, the same day President Wilson signed his $640 million aviation bill into law.[71] The same law that established the Aviation Section of the Signal Corps inadvertently caused this shortage of senior aviators, as it required that all aviators be under 30 years of age and unmarried due to the hazards of flying.[72] Thus, the Army promoted its existing Army aviators en masse at the beginning of the war to preserve their seniority to the many civilians who were receiving direct commissions into the Army. Major Bolling, for example, served as the general counsel to the US Steel Corporation when he received his direct commission from the Army and was tasked with heading the aeronautical mission.[73]

After receiving the Bolling mission's reports in July and August, Foulois and his group began drafting a plan to execute the $640 million program. In August the War Department approved its plan for an aerial fleet composed of 345 combat squadrons, 81 supply squadrons, 11 repair squadrons, 45 construction companies, and 26 balloon companies.[74] Headquarters American Expeditionary Forces modified the plan on 18 September to the slightly more realistic goal of deploying to France 260 combat squadrons, 36 training squadrons, and 90 replacement squadrons by 30 June 1919.[75] To meet the goals of this "260 squadron plan," on 30 August 1917, Pershing signed an agreement between the AEF and the French Air Ministry in which the French government would provide the AEF with 5,000 airplanes and 8,500 engines by 1 June 1918. In return, the American government would provide the French with sufficient tools and raw materials to construct the aircraft.[76]

Unfortunately, the 30 August contract ultimately failed to produce a single airplane for the AEF. According to Col Halsey Dunwoody, the assistant chief of air service at the end of the war, the contract failed for two reasons. First, the United States was unable to provide the necessary material and manufacturing assistance to the French within the time limits specified in the contract. Second, "France at that time did not take the American Aviation seriously," concentrating instead on equipping its own forces at the expense of the Air Service in France.[77]

While the American Expeditionary Forces in France were trying to acquire adequate aircraft to begin combat operations,

Foulois was organizing and implementing a massive expansion of the Aviation Section's aviation training program to provide combat-ready pilots and observers.[78] Shortly after America's entry into the war, Foulois and a small staff traveled to Canada to study the Canadian aviation training program and then based the American training program on it.[79] The American pilot training program, like its Canadian counterpart, consisted of three phases: ground schooling at civilian universities, primary flight training in the United States, and advanced flight training in France near the western front.[80] To accommodate the massive increase in pilot and observer production, Foulois tasked Maj Henry Arnold with locating possible sites for additional training aerodromes. Within one month of his appointment on 5 August, Arnold had chosen most of the airfields that the Army constructed during the war; 15 of them were operational and training pilots by the end of 1917.[81]

Foulois's other major challenge while organizing America's aviation infrastructure for war was the production of adequate materials needed for airplane construction both in America and abroad. Combat aircraft during this period used long, thick pieces of wood for the construction of the wing spar. The only wood in America that met these requirements was spruce from the Pacific Northwest. When Foulois realized that lumber companies would be unable to produce enough wing spars to meet his requirements, he authorized an alternate manufacturing method of splicing and laminating smaller pieces of wood into the long spars. He was wary of this technique given his previous bad experiences with laminated propellers while in Mexico, but he had to accept the compromise to meet his production schedules.[82]

In addition to the wood shortage, Foulois's group also had to solve a shortage in the supply of castor oil, then the only effective lubricant for airplane engines. To meet the Army's demand, American farmers planted large acreages of castor beans, and engine manufacturers experimented with a mineral oil substitute.[83] Furthermore, a shortage of linen forced the substitution of cotton fabric for the wings and fuselage of the airplanes, while scientists developed a new type of doping material made from plentiful basic materials used to make the fabric air and water tight.[84]

Throughout these initial problem-solving processes, Foulois's Joint Technical Board enjoyed the assistance of representatives of the automobile industry, which had gone through similar problems during its expansion earlier in the decade. As Foulois noted, "They were gamblers, and we had to gamble too."[85]

In October 1917, the Aviation Section was well on its way to solving the pilot training and aircraft production problems, so the War Department ordered Foulois to assemble an aviation headquarters staff and join Pershing in France. His task, as Dunwoody recounted, was to "build a large something out of nothing, and to build it quickly."[86] Specifically, Pershing charged Foulois with overseeing the "field work involved in the location, construction, and equipment of training stations, depots, shops, warehouses and aerodromes necessary for Air Service use in France, England, and Italy, and the organization and training of all personnel sent overseas."[87] However, Foulois did not have a sufficient number of experienced aviators to fill out his staff since aviation "made its greatest appeal to the younger and more daring types of officers, and was not an organization on which a great industrial expansion could be built."[88] Therefore, instead of staffing his headquarters section with aviators, whom he desperately needed as instructors in the training schools and as squadron commanders at the front, Foulois secured the services of a small group of regular Army officers who possessed administrative and executive skills and had experience running very large organizations.[89] On 29 October 1917, General Foulois and his handpicked staff of 112 officers and 300 enlisted men departed New York and arrived in Brest, France, on 12 November 1917.[90] On 27 November Pershing appointed Foulois chief of Air Service, AEF, relieving Brig Gen William Kenly.[91]

Analysis

As he demonstrated previously in the Philippines, Foulois displayed great initiative and outstanding organizational skills while commanding the 1st Aero Squadron. When the War Department gave him the task of organizing the 1st Aero Squadron in September 1914, it included no guidance on how the organization should be structured or equipped. Foulois interpreted

his order to mean that he had free rein to organize, train, and employ the unit as he saw fit and did so in an unorthodox manner. First, he eschewed the Army's traditional organization by companies as a waste of manpower and resources due to the double overhead required by the keeping of two company administrative staffs.[92] Instead, he organized the squadron into sections with one airplane, two pilots, and several enlisted maintainers per section with a single squadron administrative element serving under the commander.[93] Foulois also made the decision to reject the use of horse-drawn transportation and, instead, equipped the squadron with trucks, automobiles, and motorcycles. This made the 1st Aero Squadron the first fully motorized unit in the US Army.[94]

Foulois exhibited great personal courage in his tenure as commander of the 1st Aero Squadron. As a leader, he showed concern for his men while pushing them to, and sometimes beyond, their limits as aviators to prove the value of airpower to a skeptical War Department. During the squadron's time at Fort Sill, one of the pilots took up the squadron's quartermaster for a ride, with the quartermaster occupying the observer position in the front seat. The airplane crashed while trying to land, pushing the engine into the quartermaster's seat and injuring him. After this incident, Foulois had difficulty getting anyone to sit in the front seat for reconnaissance missions, so he volunteered as an example to the squadron. He sat in the observer seat for the rest of his tour as commander, including during the Mexican Punitive Expedition.[95] While interested in his men's welfare, he was not afraid to take risks with them, as shown by the disastrous Mackay Trophy expedition where he lost five aircraft and one pilot to unreliable equipment and inadequate training and experience. Knowing that aviation was an inherently dangerous occupation and that crashes were not uncommon, Foulois still chose to push his men and aircraft beyond the limits of their normal training routine to forge them into a combat squadron, garnering some positive publicity along the way. This desire to prove his and his squadron's worth to his superiors, regardless of the risk, would appear again during the Mexican Punitive Expedition with similar results.

Foulois learned several lessons from his Mexican experience that later influenced him as chief of Air Service in France. In

his Report on Operations for the 1st Aero Squadron's service during the Mexican Punitive Expedition, his number one recommendation was that aero squadrons operating in the field "should have a base, conveniently located, from which all supplies, material, and personnel should be drawn. This base should be independent of the field aero squadrons. . . . It should be fully equipped, to receive, assemble, and test all new aeroplanes . . . and to make repairs and alterations on same whenever necessary."[96] Foulois, in effect, was advocating a depot system where a dedicated supply and repair base receives aircraft arriving from the factories, inspects them for flaws, and prepares them for combat operations. The depot also acts as a clearinghouse for supplies and munitions, which it then distributes to the forward airfields. Finally, the base functions as a centralized repair depot for all aircraft repairs that forward-deployed aero squadrons cannot accomplish quickly in the field. As chief of Air Service in 1918, Foulois would implement this system on a grand scale in France with excellent results.

Foulois based his recommendation for a depot system on his disheartening experiences with the new aircraft and spare engines he received from American factories during the expedition. None of the factory-fresh airplanes and engines delivered by the Curtiss Company, the nation's premier aviation firm, were serviceable for field conditions upon their arrival in New Mexico. Instead, Foulois and his pilots spent several months performing their own modifications and repairs to the airplanes to prepare them for use in combat.[97] This problem would continue to plague Foulois and the American Air Service in World War I, where a majority of the American-made DH-4s arriving in France required depot-level modifications and repairs to make them airworthy for combat operations over the western front.

However, the most important lesson that Foulois and the War Department learned during the Mexican Punitive Expedition was that Army aviation was woefully unprepared for a possible war in Europe. During the 1st Aero Squadron's five months of combat operations under Foulois's command, the one concrete accomplishment of the squadron was locating a unit of lost and thirsty troops and sending six of the squadron's trucks to provide them with relief supplies.[98] Aside from this one reconnaissance success, the main duties of the squadron involved carry-

ing messages from Pershing's headquarters to the forward troops since Signal Corps troops could not lay telephone and telegraph lines without Mexican rebels cutting the wires.[99] While the whole of Army tactical aviation was trying to deliver messages between two points without crashing or getting lost, the air forces of the great powers in Europe were engaged in the Battle of Verdun, where dozens of squadrons composed of hundreds of pursuit aircraft and bombers executed thousands of air-to-air combat, artillery spotting, and tactical bombing missions.[100]

As Foulois stated in his Report on Operations, "The earnest and willing spirit, shown by every officer in the command, in performing this new and perilous service, with inadequate equipment, and under very severe conditions, is deserving of the highest commendation."[101] While praising the performance and dedication of his men, he continued to show that he would not hesitate to put them in harm's way to prove the value of Army aviation to his commander and to the War Department. On 19 March 1916, Pershing ordered Foulois to deploy the 1st Aero Squadron from Columbus to Casas Grandes for reconnaissance duty. Though the order arrived at 3:30 in the afternoon and night was soon approaching, Foulois was determined to arrive in Casas Grandes as soon as possible, emphasizing "we were ready to go, no matter what the orders were."[102] Foulois was so obsessed with the need to prove the mobility of his squadron that he ordered his squadron to fly into the dusk, even though he would not have been able to help Pershing any more by arriving the night of the 19th than if he had made a safer daytime trip on the morning of the 20th.[103] As with the Mackay Trophy fiasco, the results were dismal. One aircraft was destroyed due to lack of visibility upon landing, and its pilot nearly died after wandering through the desert for two days without water before finding assistance.[104]

Later, Foulois would play a key role in putting Army aviation on a sound footing during its buildup for combat operations in France. After America's declaration of war, the War Department tasked him with translating the nation's huge expectations for Army aviation, as evidenced by its $640 million investment, into reality. However, as Foulois succinctly stated, "Money, the magic lubricant for the wheels of American industry, was now available, but that did not mean instant availability of the tools

of war."[105] Drawing on his practical experience and organizational skills, he successfully implemented the lessons he learned in Fort Sam Houston in 1910 and 1911, North Island in 1914 and 1915, and Mexico in 1916 on a scale never before seen by the American aviation establishment. Foulois would find a similar challenge, to "build a large something out of nothing, and to build it quickly," waiting for him in France upon his arrival with his staff in November 1917.

During his fight for the $640 million aviation appropriation, Foulois developed another tactic he would continue to use throughout his career. When the General Staff rejected his aviation plan, instead of arguing with or blindly accepting the staff's decision, he decided to bypass it altogether and take his case directly to Congress. With the assistance of Secretary Baker, Foulois got his plan before the House Military Affairs Committee and boldly defied the General Staff by testifying in favor of the plan.[106] Foulois testified before the same committee after the war and, with his usual bluntness, gave his opinion of the General Staff: "You can go back over the entire history of aviation in the United States Army up to 1919, and you will not find, to my knowledge, one single case on record where a General Staff officer of the United States Army has contributed to the technical or mechanical development of aviation in the United States Army."[107] This conflict over the role of airpower in the army between Foulois and other aviators and the ground officer–dominated General Staff continued to fester for the remainder of Foulois's career.

During his tours as a troubleshooter for the Signal Corps flying school and as the first commander of the 1st Aero Squadron, Foulois was obsessed with proving the worth of aviation to the War Department, Congress, and the American public. He made great strides toward turning the Signal Corps Aviation Division into a combat organization but paid a heavy price in aircraft destroyed and pilots injured or killed. As a political infighter within the War Department, Foulois learned how to maneuver around the intransigence of the General Staff to move forward his agenda for Army aviation. While there, he was instrumental in creating from nearly nothing a robust national infrastructure for aviation training and aircraft production. Foulois's next challenge was to take these skills and lessons learned and

accomplish a seemingly impossible task, that of "creating and equipping . . . an Air Force larger than the entire United States Army, as it existed in 1917."[108]

Notes

1. Chandler and Lahm, *How Our Army Grew Wings*, 261.
2. Foulois, "Early Flying Experiences (Continued)," 132.
3. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 112.
4. Ibid., 113.
5. Ibid.
6. Shaughnessy, "Flight Interview," 20.
7. Shiner, *Foulois and the U.S. Army Air Corps*, 6.
8. Pugh to Headquarters USAF, memorandum.
9. Foulois, "Personal Service Record," 5.
10. Goldberg, *History of the United States Air Force*, 9.
11. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 116–17.
12. "Mackay Aviation Trophy Awarded." The Mackay Trophy is awarded by the National Aeronautic Association for the "most meritorious flight of the year" by a military person, persons, or organization.
13. Maurer, *U.S. Air Service in World War I*, vol. 2, 27.
14. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 118.
15. Foulois, "Personal Service Record," 5.
16. AFSHRC, "Oral History Interview 766," 22.
17. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 121.
18. House Committee, *Hearings*, vol. 2, 491.
19. Jones, "Flight Surgeon Support," 5–6. Greene would go on to earn his pilot's wings and eventually became the second president of the Aero Medical Association.
20. Goldberg, *History of the United States Air Force*, 10.
21. Foulois, "Report of Operations," 1.
22. "Flyers to Aid in Chase."
23. House Committee, *Hearings*, vol. 2, 478.
24. AFSHC, "Oral History Interview 766," 24.
25. Foulois, "Report of Operations," 1.
26. Shaughnessy, "Flight Interview," 62.
27. Foulois, "Report of Operations," 2.
28. Maurer, *U.S. Air Service in World War I*, vol. 2, 67.
29. Foulois, "Report of Operations," 6.
30. Ibid.
31. Foulois, "Personal Service Record," 4.
32. AFSHC, "Oral History Interview 1002," 1.
33. Foulois, "Report of Operations," 8.
34. "Complains of Aeroplanes."
35. Foulois, "Personal Service Record," 8.
36. Foulois, "Report of Operations," 9.

37. Pershing, *My Experiences in the World War*, vol. 1, 159.
38. Foulois, "Personal Service Record," 8.
39. Maurer, *U.S. Air Service in World War I*, vol. 2, 67.
40. Foulois, "Personal Service Record," 8.
41. Goldberg, *History of the United States Air Force*, 11.
42. Maurer, *U.S. Air Service in World War I*, vol. 2, 91.
43. Ibid., 411.
44. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 141.
45. Maurer, *U.S. Air Service in World War I*, vol. 2, 100.
46. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 141.
47. Foulois, "Air Service," 2.
48. Craven and Cate, *Army Air Forces in World War II*, vol. 1, 5.
49. "Final Report of the Chief of Air Service," 23.
50. "Huge American Air Fleet."
51. Maurer, *U.S. Air Service in World War I*, vol. 2, 105.
52. Shaughnessy, "Flight Interview," 64.
53. Craven and Cate, *Army Air Forces in World War II*, vol. 1, 5.
54. Copp, *Few Great Captains*, 16–17.
55. Pugh to Headquarters USAF, memorandum.
56. Hudson, *Hostile Skies*, 6.
57. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 147.
58. Patrick, "History of the Air Service," 9.
59. Hudson, *Hostile Skies*, 3.
60. Ibid.
61. Morrow, *Great War in the Air*, 265.
62. Ibid.
63. Craven and Cate, *Army Air Forces in World War II*, vol. 1, 6–7.
64. Patrick, "History of the Air Service," 2.
65. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 156.
66. Patrick, "History of the Air Service," 6.
67. War Department, "Brief History of the Air Service," 2.
68. Ibid., 1.
69. Hudson, *Hostile Skies*, 14.
70. Ibid., 268.
71. Pugh to Headquarters USAF, memorandum.
72. *Official Record of the United States' Part in the Great War*, 92.
73. Hudson, *Hostile Skies*, 13.
74. Ibid., 6.
75. Craven and Cate, *Army Air Forces in World War II*, vol. 1, 10.
76. "Final Report of the Chief of Air Service," 24.
77. Dunwoody, "Final Report of Assistant Chief of Air Service," 2.
78. Foulois, "Personal Service Record," 9.
79. Hudson, *Hostile Skies*, 27.
80. The American system of ground school, primary flight training, and advanced type-specific training remains in use to this day by the US Air Force.
81. Hudson, *Hostile Skies*, 28–29.
82. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 154–55.

83. *Official Record of the United States' Part in the Great War*, 99.
84. Ibid.
85. AFSHRC, "Oral History Interview 766," 31.
86. Dunwoody, "Final Report of Assistant Chief of Air Service," 1.
87. Foulois, "Personal Service Record," 9.
88. *Official Record of the United States' Part in the Great War*, 92.
89. Foulois, "Air Service," enclosure D, 6.
90. Foulois, "Personal Service Record," 10.
91. Foulois, "Air Service," 6.
92. Shaughnessy, "Flight Interview," 64.
93. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 119.
94. AFSHRC, "Oral History Interview 766," 21.
95. Shaughnessy, "Flight Interview," 24.
96. Foulois, "Report of Operations of the First Aero Squadron," 9.
97. Ibid., 10.
98. Ibid., 2.
99. AFSHRC, "Oral History Interview 766," 26.
100. Morrow, *Great War in the Air*, 132, 149.
101. Foulois, "Report of Operations of the First Aero Squadron," 11.
102. Shaughnessy, "Flight Interview," 76.
103. Johnson, *Wingless Eagle*, 165.
104. Ibid., 166.
105. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 147.
106. Shiner, "Benjamin D. Foulois," 17.
107. *Aircraft*: *Hearings*, vol. 2, 482.
108. Foulois, "Air Service," 2.

Chapter 4

Leading the War in the Air (1917–18)

Arriving in France with his staff on 12 November 1917, Foulois was shocked at the condition of the Air Service he was about to command, noting in his memoirs, "Although I expected some lack of organization, I was not mentally prepared for complete chaos when it came to the Air Service."[1] How did Foulois leverage his aviation and engineering experience to build the fledgling Air Service into the massive fighting organization Pershing required to support his ground forces? Over the next six months, Foulois worked tirelessly to solve the myriad logistical challenges that he faced, including procuring aircraft, training pilots and mechanics, and building a supply system and its accompanying infrastructure. Complicating his task were chronic delays in the arrival of Air Service personnel and materiel from America, an American aviation industry that was simply not prepared for the task of fulfilling Foulois's production plan, and a lack of both experienced aviators to lead combat squadrons in the field and veteran staff officers to administer the rapidly expanding Air Service.

Reorganizing the Air Service

When Foulois took command of the Air Service, he inherited an organization that suffered from both internal and external strife. Soon after General Pershing arrived in June 1917, he established a General Staff College at Langres that taught an intensive three-month course in staff work to the many members of his staff who had no general staff education or experience.[2] The General Staff College program resulted in a staff that possessed "a common doctrine, with a loyal sense of cooperation well accentuated."[3] Unfortunately, the three primary Air Service staff officers serving in France prior to Foulois's arrival never attended the Staff College. As Foulois notes, "[Raynal] Bolling was doing his business by mail and cablegrams with the State Department in Washington, [Townsend] Dodd was trying to persuade Pershing's staff to give him the supplies and

facilities he needed to get the training underway, and [Billy] Mitchell . . . was running all over France raising the devil with everyone he met."[4] The lack of a common education and doctrine between the AEF General Staff and the Air Service resulted in multiple conflicts that Foulois had to solve immediately if he was to place his expansion program on a solid footing.

Throughout the summer of 1917, the Air Service in France suffered from internal confusion and division of responsibility. Pershing gave Colonel Mitchell, acting as the aviation officer for the expeditionary forces, jurisdiction over the frontline areas known as the zone of the advance and assigned Major Bolling, after the completion of his aviation mission, jurisdiction over the zone of the interior. This arrangement effectively divided the responsibilities of the Air Service between two men, resulting in inefficiencies and confusion about the chain of command. On 3 September, Pershing rectified the situation by appointing Brig Gen William Kenley, an artillery officer, as the chief of Air Service with command authority over both Mitchell and Bolling.[5] Pershing also moved the Air Service's headquarters to Chaumont, where it would be colocated with Headquarters AEF.[6]

After his arrival on 12 November, Foulois spent two weeks inspecting Air Service facilities and units throughout France to assess their state and then officially took over from Kenley as chief of Air Service on 27 November. Pershing also named Foulois a member of the Joint Army and Navy Aircraft Committee in France, his representative to the Inter-Allied Expert Committee on Aviation of the Supreme War Council, and the commandant of Army Aeronautical Schools in France.[7] On 12 December, Foulois announced the composition of his new headquarters, which he divided into eight sections: policy, administration, technical, training and organization, operations (zone of the advance), balloon, personnel, and supply.[8] As part of the reorganization, Foulois removed Bolling from his position as assistant chief of Air Service, Lines of Communication, and appointed him as the chairman of the Joint Army and Navy Aircraft Committee, where he worked to coordinate industrial, military, and naval activities in Europe and the United States.[9]

Foulois's reorganization of the Air Service marked the first of many conflicts with Mitchell, who noted in his memoirs, "A

more incompetent lot of air warriors had never arrived in the zone of active military operations since the war began."[10] Foulois rejected Mitchell's inference that the Air Service needed experienced pilots in the headquarters positions rather than executives with direct commissions by noting, "We had no planes to fly, no organization to train them, and no facilities to sustain air operations."[11] Foulois's first priority was to build a supply and training infrastructure in France, and he built his staff with this goal in mind. Mitchell also states, "The competent men, who had learned their duties in the face of the enemy, were displaced and their position taken by these carpetbaggers." Again, Foulois disputed Mitchell's assertion, noting that the only officer he displaced was Mitchell himself, whom Foulois replaced with Col Robert Van Horn, a nonflyer with extensive experience in the Spanish-American War and the Philippine Insurrection. Foulois stated that he placed Mitchell in command of the Air Service components of I Corps to place him under the tight disciplinary control of its commander, Maj Gen Hunter Liggitt, and to give Mitchell a chance to prove himself as the commander of a corps-level aviation unit.[12]

Meeting the Challenges

Upon taking command of the Air Service in France, Foulois focused his efforts on four main areas to implement his plan for the massive expansion of American aviation on the western front. First, he had to establish the infrastructure of the massive organization, including assembly and repair plants, air depots, and airdromes. Second, he had to procure both aircraft and spare parts from the United States and its Allies for training purposes and for combat operations on the front. Third, he had to build an advanced training program for flying personnel arriving from the United States to prepare them for combat. Finally, Foulois had to oversee the severely limited air operations on the western front while preparing his frontline squadrons for future combat operations.[13] The shortage of Air Service personnel throughout the summer meant that solutions to these problems remained in the planning stages, with the exception of several aircraft orders with the French and Italians and the construction of a training center at Issoudun and an

air depot at Colombey-les-Belles.[14] When Foulois arrived with his 112 staff officers in November, he promptly directed the staff to execute the operations plans.

Materiel Procurement and Aircraft Assembly

From the beginning of American involvement in the war through Foulois's arrival in France, the Air Service had relied almost exclusively on the French aircraft industry for supplies, spare parts, and other materiel. In a situation unique to France, almost the entire French aircraft industry was concentrated around the capital city of Paris, driving the Air Service's decision to establish its supply office there instead of at Chaumont with the rest of the Air Service headquarters. After studying the situation, Foulois decided to violate Pershing's policy of colocating all American headquarters units. He allowed the Supply Section to remain in Paris with the understanding that once production from the United States eclipsed French production, the section would rejoin the rest of the headquarters.[15] However, American delivery of aircraft and aviation supplies never caught up to French production. Therefore, Foulois's decision in spring 1918 to relocate the entire headquarters, including the Supply Section, to Tours resulted in so much confusion and delays that he had to move the Supply Section back to Paris two months later.[16]

Based on the Supply Section's need to purchase large amounts of aviation materiel from factories around Paris, Foulois authorized the acquisition of a large German-owned warehouse in Clinchy for the storage and distribution of supplies.[17] In addition, instead of waiting for the Corps of Engineers to build an American acceptance facility for foreign aircraft, he arranged with the French government to use French aviation facilities at Le Bourget for the assembly, test, and acceptance of French aircraft sold to the Air Service. However, when German bombers attacked Le Bourget in March 1918—destroying several American Spad pursuit aircraft in the process—the French government refused to take responsibility for American aircraft at the post, and Foulois directed the Air Service to build a replacement acceptance facility.[18]

On 19 March, the General Staff approved the construction of American Aviation Acceptance Park No. 1 at Orly, both to disperse American supply activities in the event of further German raids and to relieve the congestion at the acceptance fields at Le Bourget.[19] The Orly complex, covering 471 acres, began flight operations only nine days after construction commenced, and, by the end of the war, the facility was able to deliver 90 aircraft a day to the front.[20] Since French aircraft were handbuilt to varying specifications depending on the company that produced them, mechanics at Orly needed to test each airplane for airworthiness, repair any manufacturing defects, and equip it with standardized armament or reconnaissance equipment. Once American aircraft began arriving in France, Foulois designated Orly as the primary acceptance facility for all aircraft procured from France, Italy, and the United Kingdom.

Due to their light weight and great bulk, American aircraft were not shipped to France fully assembled. Instead, aircraft manufacturers built major components of the aircraft and then tightly packed them into shipping crates for their journey to France. Foulois therefore had to decide if the Air Service should build an assembly facility next to each port and assemble the aircraft as soon as they left the ship or, instead, build one large centralized facility for the assembly of aircraft arriving at all French ports. He quickly rejected the first option, noting that the Air Service had neither the personnel nor the material to build and operate multiple assembly plants.[21] Therefore, on 17 January 1918, the Air Service began the construction of Air Service Production Center No. 2 at Romorantin, located on a major railway approximately 100 miles south of Paris and 50 miles east of Tours.[22] The service designated the Romorantin facility for the assembly and testing of American-built aircraft just as it designated the Orly facility for the acceptance of aircraft purchased from the Allies.

Because of the rapid buildup of the American aircraft industry and the Air Service, most of the personnel reporting to Romorantin for duty had seen neither a Liberty engine nor an American-built aircraft. Therefore, the few experienced Air Service mechanics had to perform the double duties of assembling the American aircraft and training new maintenance personnel on site, and they eventually provided training for personnel at

other air depots as well.[23] Moreover, many of the American DH-4s arrived with significant structural problems, so the mechanics at Romorantin had to make many modifications to the rigging and engines to make the aircraft combat ready.[24] The facility received its first American-built DH-4 with the Liberty engine on 13 May 1918, and assembly in quantity began in July.[25] Foulois's next challenge was to ensure that air depots were available to arm and deliver the aircraft to the front and that adequate airfields were available to receive them.

Air Depot and Airfield Construction

Soon after the formation of the Air Service in France, the Lines of Communication staff realized that the Air Service would need an air depot for the reception and distribution of personnel and material, as well as a site near the front for the repair of airframes, engines, and motor vehicles. When the first Air Service troops arrived in quantity in October 1917, they began construction of the 1st Air Depot at Colombey-les-Belles, including repair facilities, storage areas, personnel barracks, and several airfields.[26] When Foulois arrived with his staff, he diverted additional resources to Colombey-les-Belles to expedite construction in anticipation of the commencement of combat operations. Foulois also contemplated building additional air depots the following spring, but he discarded the idea due to a slowdown of the Air Service's aircraft procurement program combined with the specter of a German offensive in March 1918.[27]

When the first squadrons of the American Air Service stood up in February 1918, the War Department was unable to provide sufficient aircraft, engines, supplies, or spare parts via American manufacturers. As a result, the American Air Service entered into a contract with the French air service whereby the French would provide supplies, equipment, and spare parts for the American squadrons beginning to receive their French-built aircraft. However, during March and April the French informed the Supply Section that they could not fulfill their part of the contract due to the pressing needs of the French air service.[28] In May Foulois directed the Supply Section to design a plan to establish and maintain an American Air Service supply system as soon as possible. On 23 May Aircraft Production

Board officers submitted their "Air Service Plan of Supply, Salvage, and Repair," and Foulois immediately implemented it.[29]

Figure 1 shows the resulting supply system as it existed on 11 November 1918. The Air Service received aircraft procured from America's Allies at Orly and aircraft from the United States at Romorantin. After assembly, testing, and acceptance, specially trained pilots ferried the aircraft to the air depot at Colombey-les-Belles, where the aircraft were again tested, repaired, and outfitted depending on the mission of their destination squadron. Initially, the air depot customized the aircraft according to the requirements of the squadron commander or even individual pilots, in keeping with French practice. However, once aircraft deliveries picked up in summer 1918, the Supply Section abandoned the practice in favor of standardized configurations. In the last stage of the process, when a set of aircraft was ready for delivery, the squadron's pilots arrived to ferry them the short distance to the front.[30]

Unlike the relative ease with which Foulois was able to secure sites for the Air Service's supply infrastructure, he had much more difficulty determining where to base American combat squadrons. When Pershing informed Foulois that the AEF would occupy the sector of the western front approximately bordered by Verdun and the Swiss frontier, Foulois was very worried that a likely German offensive in spring 1918 would result in the loss of any newly constructed airfields to the Germans. In addition, the American sector of the front was heavily wooded and dotted with rolling hills and mountains, making airfield construction difficult if not impossible. Nevertheless, Foulois sent out survey teams to the American sector in December 1917 to scout out possible sites for airfields between 40 and 80 kilometers from the front.[31]

Unsure about the Air Service's ability to locate and build suitable airfields in time for the German spring offensive, Foulois entered into negotiations with the French in January 1918 for the acquisition of completed and nearly completed French airfields in the American sector. Foulois and the French agreed that if the Air Service could not complete the construction of airfields before the arrival of American combat squadrons, the aircraft would use nearby French airfields until construction was completed. Furthermore, if the Air Service transferred a

combat squadron using a French airfield to another sector, the airfield would revert to French control.[32]

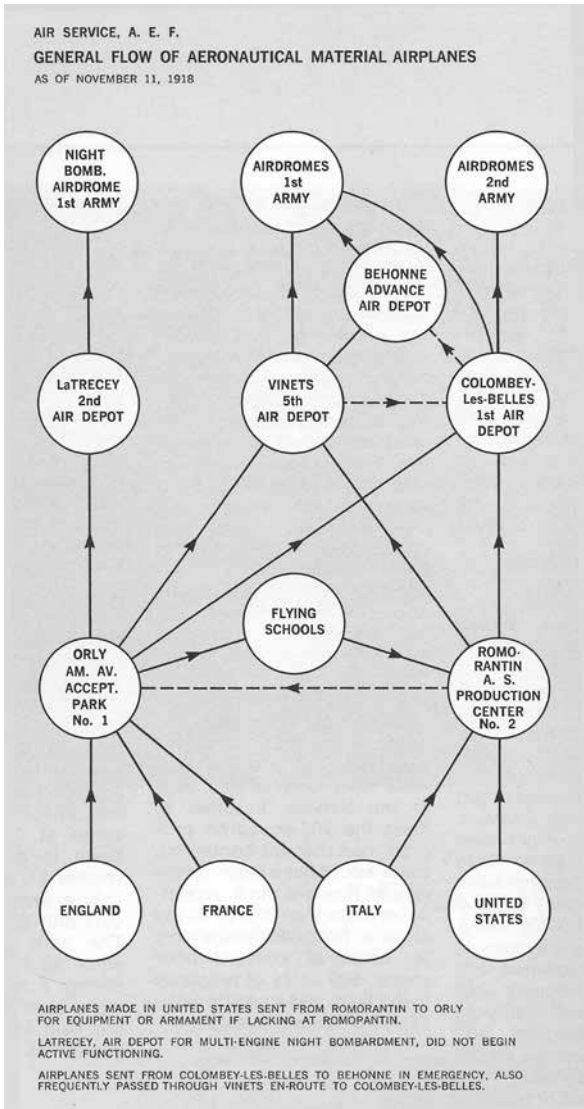


Figure 1. American Air Service's supply system in France. (Reprinted from Maurer Maurer, *The U.S. Air Service in World War I*, vol. 1 [Washington, DC: Office of Air Force History, US Air Force, 1978], 118.)

Throughout Foulois's negotiations, the French repeatedly and earnestly informed him that they needed airfields as much as the American Air Service did and that Foulois should make every effort to build his own airfields as quickly as possible. By spring 1918, however, Foulois saw that the Air Service's shortage of labor troops and construction equipment was slowing down the construction process, jeopardizing the progress of the Air Service program. To speed up construction, Foulois sent an Air Service officer back to the United States with orders to purchase several tractors, ditch diggers, and graders and arrange for their shipment to France. Unfortunately, due to shipping delays, the equipment did not arrive in France until the summer, by which time the aircraft procurement program had slowed down to the point where the additional airfields were no longer necessary. Instead of airfield construction, the Supply Section put the equipment to use on other construction projects.[33]

Aircraft Production

Foulois's problems with the Air Service's aircraft procurement program began with the severe difficulties in executing the 30 August contract with the French Air Ministry in which the French government would provide the Americans with 5,000 airplanes and 8,500 engines by 1 June 1918 and the Americans would provide the French the tools and raw materials to construct the aircraft. By 1 December 1917, the French had failed to provide any airplanes, and the Americans had delivered a negligible amount of tooling and raw materials. At the end of December, Bolling reported to Foulois that the French minister of munitions informed him that the French would not be able to meet the June production deadline because of lack of materials and tooling that the Americans were obligated to provide under the contract.[34] Foulois promptly reported the new developments to Pershing, and they agreed that Foulois should abrogate the 30 August contract and negotiate a new contract in its place. At the end of January, Foulois met with the French minister of munitions, and the parties agreed to replace the 30 August contract with a new one in which the French would provide aircraft and materiel for American squadrons as the Air Service placed them on the front.[35] Foulois's

staff and the French spent the next four months negotiating the specifics of the contract; on 3 May 1918, Pershing and the minister of munitions signed the new agreement.[36]

The 3 May contract marked a significant change in French policy toward the American Air Service. Previously, the French provided the American Air Service with small numbers of obsolescent aircraft while retaining the newer frontline pursuit aircraft for their own use. However, the new contract contained the following clause in Article VII, paragraph 2: "Until the American Army is able to meet its own requirements in aeronautical material, the French Government agrees to place at the disposal of the large established units (army corps, division) which the United States Government shall place effectively in line on the French front, *the same aviation material in quality and quantity as if large French units were involved"* (emphasis added).[37] With this contract, the French effectively made the American Air Service an equal partner in the war and proved their willingness to sacrifice the needs of their own air service to help an American air service in desperate need of combat aircraft.

Foulois, for his part, was determined to see that the United States provided the French with the raw materials and tooling they needed to build the aircraft. To this end, Foulois wrote multiple cables to the War Department for Pershing's signature, pleading for the United States to meet its obligations under the 30 August contract. In a 16 February cablegram from Pershing to the chief signal officer, Foulois wrote,

> Regarding allocation of wood in the States[, the] Paris Committee cannot agree with wisdom of retaining from 30 to 40 percent of available supply for the United States Production in view of the obvious impossibility of converting the lumber into planes, shipping them to France, and putting them on the front in time to be of the most service to the Allied cause. . . . We recommend most energetic measures to procure immediately and deliver at seaboard to the French the amount of wood needed by France before March 15th even if it becomes necessary to ship lumber from the yards of our own factories.[38]

In these cablegrams, Foulois's argument was simple: the United States had plenty of raw materials but could not build aircraft quickly enough to equip Air Service units for the summer offensive, while the French could build quality aircraft im-

mediately but lacked the raw materials to do so. Foulois's persistence paid off, and by 1 May 1918, America had delivered to France approximately 90 percent of the raw materials and machine tools the 30 August contract called for.[39] The French replied in kind by providing the Air Service with over 4,700 aircraft of all purposes and actually delivered an excess of spare parts to the American squadrons, equating to one-and-a-half times the amount of equipment delivered to similar French squadrons.[40] These developments were critical to the buildup of the American Air Service on the western front. As Maj Gen Mason Patrick noted in his final report, "The concluding of this agreement proved the turning point in the history of American aviation supply questions in France and laid the foundation of the supply for our effort at the front."[41]

The problem of supplying sufficient quantities of materials to America's Allies was not limited to the French. Throughout America's involvement in the war, the French, British, and Italians constantly fought against each other to secure raw, semifinished, and finished materiel from the United States. To bring some rationality to the material supply process, Foulois convinced the War Department to appoint him to the Air Production Board where he was able to use his influence as chief of Air Service to control the flow of aviation materiel from the United States to where he needed it on the front.[42] Foulois put this power to good use while acting as Pershing's representative to the Inter-Allied Expert Committee on Aviation, where he was able to trade raw material from the United States for airplanes, spare parts, and other aviation materiel from Allied nations.[43]

Soon after taking command of the Air Service, Foulois began searching for ways to acquire bombardment aircraft for the Air Service. In November 1917 Bolling met with representatives of the British Air Board, and they discussed the possibility of the United States manufacturing parts for the Handley Page bomber and shipping them to the United Kingdom for assembly and testing. By shipping only portions of the bombers to the United Kingdom (such as large wing sections and engines) instead of complete aircraft, the United States could save a significant amount of space and tonnage for its already strained cargo shipping operation.[44] Assembling the bombers in the United Kingdom allowed the Air Service to take advantage of

trained and experienced Handley Page and Royal Flying Corps personnel, and the move prevented layoffs at the mills in Lancashire, UK, where Handley Page manufacturers oversaw the work.[45] Colonel Bolling and the British Air Board verbally committed to the agreement in December, and on 26 January 1918 Foulois personally supervised the drafting and approval of the Handley Page agreement in his capacity as chairman of the Joint Army and Navy Aircraft Committee.[46]

Foulois's extensive negotiations with the French and British for the procurement of aircraft were an absolute necessity to get the Air Service on the western front and in the fight as quickly as possible. In fact, the first American-built combat aircraft did not arrive in France until May 1918, just three weeks before the end of Foulois's service as chief of Air Service. Why had it taken so long for the American aircraft industry to produce and deliver aircraft to the front? After the United States entered the war in April 1917, American aircraft companies expanded feverishly, but haphazardly, to meet the expected demand for combat and training aircraft. Existing companies rapidly expanded to many times their prewar size, and many new companies entered the industry.[47] Unfortunately many of the existing aviation manufacturers were unable to make a successful transition from their traditional customized construction to an assembly-line system that could produce high-quality aircraft in quantity.[48] Additionally the difficulties involved in taking hand-built European aircraft and adapting the designs for mass production stymied the efforts of American aviation companies to meet their production goals.[49] A prime example of this difficulty was the abortive $30 million contract with Curtiss to produce French Spad pursuit aircraft outfitted with eight-cylinder Liberty engines, which the government cancelled in November 1917 due to airframe production problems and the inadequacy of the Liberty engine for use in pursuit aircraft.[50] Finally, the Aviation Section of the Signal Corps knew that there could not be an air service in France without sufficient pilots, so the Aircraft Production Board devoted a majority of aircraft production early in the war to training aircraft for domestic use. In January 1918, the United States was producing aircraft at a monthly rate of 800 planes, of which 700 were primary trainers for use in the United States.[51]

Personnel and Training

Just as Foulois and the Air Service depended on the Allies for aircraft until American production could take over the requirements, they also had to rely on the Allies for primary and advanced pilot training until the Aviation Section stood up an expanded pilot training program in the United States. After America's entry into the war, France, the United Kingdom, and Italy agreed to train American pilots during the summer of 1917, but personnel problems delayed the arrival of the first American aviation cadets until September. By this time, however, the best flying weather had passed, and the Allies reneged on their promises to provide sufficient flight instructors due to the pressing need for pilots in their own air services.[52] The combination of bad weather and a shortage of instructors led to a significant backlog of student pilots, creating a major problem for the Training Section of the Air Service.[53] In late November Foulois informed the War Department, through Bolling, that no more untrained pilots should be sent to France. He then requested that all pilots sent to France arrive with predeployment training in gunnery, observation, and night flying and at least some instruction in bombardment.[54]

Shortly after his arrival in France, Foulois noted the hundreds of aviation cadets marking time in Paris and resolved to put them to work on other Air Service needs. One of his first acts as chief of Air Service was to establish on 6 December the Air Service Mobilization Station at Saint-Maixent, which functioned as a receiving depot and clearinghouse for all Air Service personnel arriving in France, including the furloughed pilots in Paris. Foulois's staff deployed the wingless pilots around France for construction work, guard duty, cooking details, and any other jobs necessary to stand up the Air Service and accelerate the construction of pilot training schools.[55] According to Foulois, "These steps soon relieved the temporary congestion of flying personnel . . . and provided a Mobilization Base in France at which all arriving Air Service personnel could be concentrated, reorganized, and dispatched to points in France where their services were most needed."[56]

The Air Service's Training Section assigned many of the furloughed aviation cadets to assist in the completion of the mas-

sive American pilot training base at Issoudun. Construction began on the facility in August 1917, and instruction of the first class of eight students began on 24 October 1917. Notable members of this first class included First Lieutenants Quentin Roosevelt, Eddie Rickenbacker, and Edgar Tobin.[57] Once the Allied air services stabilized their pilot needs, they released a number of experienced pilots to Issoudun to provide American pilots with both basic and advanced flight training while the American flying schools were continuing their buildup. Once the Air Service was able to accomplish both primary and intermediate flight training in the United States, the training center at Issoudun focused on using experienced French, British, and American instructors to give new Air Service pilots advanced instruction in the aircraft they would be flying on the front and in the tactics they would use against the Germans.[58] Expansion of the Issoudun complex continued throughout the war, and it eventually became the largest aviation school in the world. Using Issoudun's facilities, the Training Section cleared the backlog of furloughed aviation students by May 1918. Within one year of its opening, Issoudun produced 1,751 graduates with only 78 student fatalities.[59]

The Training Section acquired several other facilities besides the primary training school at Issoudun. On 1 November, the section acquired the French aviation school at Tours, and for several months, Tours was the only school that provided primary flight training.[60] Once training schools in the United States were able to take over primary flight training, the facility was converted to provide observer, gunnery, photographic, and radio training, as well as aviation-related medical research.[61] The school trained 535 observers over the course of the war, and aerial gunnery instruction eventually became mandatory for all Air Service pilots.[62] On 15 November, the French ceded the aviation school at Clermont-Ferrond to the Air Service for air bombardment training.[63] In addition to producing 447 American bombardiers, the school also designed and produced an advanced bombing sight—the Seventh Aviation Instruction Center Sight—that proved to be superior to all the sights the Allies had previously used.[64]

Besides the backlog of pilot trainees, Foulois also had to deal with a severe shortage of trained aviation mechanics. Fewer

mechanics than planned were arriving from the United States, and those mechanics and riggers that did show up in France were untrained on the foreign aircraft that the Air Service had procured from the French.[65] Further exacerbating the problem was the lack of suitable buildings and construction materials to build maintenance training schools in France.[66] On 5 December 1917 Foulois solved this problem by signing an agreement with the British whereby the Air Service would send 15,000 mechanics to the United Kingdom for instruction and eventual deployment to American squadrons in France. Specifically, the memorandum of agreement stipulated,

> On arrival in the United Kingdom [the American mechanics] will be drafted into existing training units of the R.F.C. [Royal Flying Corps] releasing an equal number of trained R.F.C. personnel for R.F.C. service squadrons. Their training would be undertaken in exactly the same lines as is adopted with the R.F.C. and as, from time to time, their training is completed, batches of these American mechanics shall be released for posting to American Units formed, or forming, in France, their places in the R.F.C. units at home being taken by an equal number of untrained American mechanics from the United States.[67]

This memorandum, like the Handley Page agreement, benefited both the United States and Britain. The Air Service received fully trained mechanics with experience on frontline foreign aircraft. The British, in turn, received thousands of additional mechanics to help alleviate their manpower shortages.[68]

Unfortunately both the Germans and the War Department General Staff further exacerbated Foulois's personnel shortages in the spring of 1918. In March the General Staff in Washington cancelled the movement of all Air Service personnel to France, reserving the tonnage for ground forces in anticipation of a German offensive later that month. In early 1918, the United States could provide for the transport of 92,000 men per month, barely enough to send the two divisions per month envisioned by the AEF deployment plan.[69] This decision left over 6,000 badly needed Air Service personnel stranded in New York awaiting transport. Foulois strenuously objected to the General Staff's decision, noting that only 6,000 of the 15,000 mechanics promised to the British had arrived in the United Kingdom.[70] Patrick notes in one of his postwar reports that this embargo on Air Service personnel "resulted in . . . retarding the

development of the Air Service by approximately four months, since it made unavailable the manpower to operate the existing all-too-small establishments at their normal output, and deferred the operation of new and additional projects."[71] The Germans rendered Foulois's objections moot on 21 March when they began their Ludendorff Offensive and subsequently opened a salient pointed straight toward Paris. The situation became so dire that by May, the General Staff shifted its shipping priorities to transport only infantry and machine gun troops without their normal complement of supply, artillery, or aviation units.[72]

Foulois also had to deal with interference from the AEF's General Staff. According to the Air Service expansion plan approved by the AEF General Staff in January 1918, Foulois was to receive 30,000 personnel by 30 June 1918. Ultimately, only 13,000 of the 33,000 aviation personnel were under his direct or indirect control.[73] Earlier in the year, Foulois discovered that 12,000 aviation mechanics that he had slated to maintain and repair American aircraft procured under the now defunct 30 August contract had been reassigned by the AEF General Staff for other undefined purposes.[74] After five months of correspondence with the General Staff, Foulois found out that the War Department General Staff had entered into an agreement with the French whereby the United States would provide France with 60,000 workers for service under the French government. To fulfill the contract and without discussing the matter with Foulois, Pershing's General Staff diverted the 12,000 trained aviation mechanics to the French for use as truck drivers and vehicle mechanics.[75] Incensed that trained aviation mechanics were driving trucks for the French, Foulois confronted the General Staff and convinced them to bring two additional regiments of mechanics from the United States to France for duty with the Air Service.[76] The additional regiments of mechanics, however, never fully filled the void left by the 12,000 missing aviation mechanics and, combined with the other 8,000 Air Service troops assigned to other projects throughout France, the Air Service remained chronically undermanned for the rest of the war.

Combat Operations

While Foulois's primary concerns as chief of Air Service focused on procuring adequate numbers and quality of aircraft, producing trained pilots and mechanics to fly and repair the aircraft, and building a robust infrastructure for the Air Service, he never forgot the end goal of his efforts—developing a world-class air force to fight the Germans on the western front. Foulois was convinced that the success of the AEF depended on an air service large enough and experienced enough to gain and maintain air superiority over the front.

In a memorandum to Pershing's chief of staff dated 23 December, Foulois explained why the AEF needed a strong air service and provided recommendations for expanding the Air Service in time for the Allied operations in summer 1918. First, he relayed the opinions of the Allies on America's shipping priorities by noting, "Each and every high official, military and civilian, with whom I have conferred has frankly stated that under the existing conditions of ship tonnage, the most swift and effective assistance which the United States can give during the Summer and Fall of 1918, is through its air forces."[77] Next, he discussed the perils of an insufficiently equipped air service by stating, "From a strictly tactical viewpoint, if Germany secures air supremacy in night bombing in 1918, the first military objective of the German Air Service will be the Allies[']Airdromes and their squadrons, in order to prevent counter-offensive on the part of the Allies."[78]

He then made his case for an expanded air service, writing, "Our entry into the war with large resources of personnel and aircraft materials, if promptly taken advantage of, will allow the Allies and ourselves to take the strategical offensive next Summer, against the German industrial centers, German airdromes, and German lines of communications."[79] He concluded his report with several recommendations, including cooperating with the British and French in planning a combined "strategical fighting and bombing campaign" against the Germans in the summer and combining the efforts of the Air Service and General Staff to produce a detailed air service program that covered the buildup of operations, training, and supply units.[80]

Foulois's oversight of American combat operations at the front, however, did not occupy a lot of his time as chief of Air Service because there were no American combat operations until the middle of 1918. As of 1 April the Air Service possessed only one tactical squadron, the 1st Aero Squadron that Foulois led during the Mexican Punitive Expedition in 1916.[81] After its arrival in France on 3 September 1917, the 1st Aero Squadron transitioned from the Curtiss JN-4 to French observation aircraft, and its pilots received extensive training from the French as an observation squadron.[82] Although additional American squadrons arrived in the fall and winter and went through a similar training process, only seven American squadrons had made it to the western front. The four observation and two pursuit squadrons and one day-bombing squadron were assigned to the American First Army as combat ready, but they continued to receive battle training from British and French pilots through summer 1918.[83]

Change of Command

In April 1918, Foulois determined that the tentative Air Service staff organization he had put in place after assuming command in November could no longer adequately administer the rapidly expanding service, which had grown from 6,500 personnel in November 1917 to over 39,100 personnel in April 1918.[84] On 11 April, he appointed a board of officers to examine the problem and propose a new air service organization that could better distribute the disproportionate burden carried by the Supply Section and speed up the development of the Radio and Photographic Sections.[85] The board submitted its recommendations to Foulois on 20 April, and on 30 April he implemented the new control diagram for the Air Service. Foulois divided the Air Service staff into six divisions instead of the original eight: training; personnel; motor transport; supply; assembly, salvage and repair; and balloon, photo, and radio.[86] This new organization split the burden of the original Supply Section among the new sections of supply, which handled the distribution of aviation materiel; motor transport, responsible for all motor vehicles in the service; and assembly, salvage, and repair, which took over supervision of the Air Service produc-

tion centers and air depots. In keeping with his policy of sending aviators to the front as soon as nonflyers were able to take their places, Foulois relieved Dodd and his assistant from their positions in the Supply Section and sent them to command flying squadrons at the front.[87]

Although Foulois made great efforts to build up the Air Service during his first six months in command, Pershing could no longer ignore Foulois's lack of progress in getting combat squadrons to the front to support the 18 American divisions that had arrived in France by May 1918.[88] The individual abilities of Foulois's staff members, while excellent, did not make up for their inexperience in military staff work. Internal strife within the Air Service took many forms. The air officers already in France when Foulois showed up were for the most part regular officers, while most of Foulois's new staff was composed of recently commissioned civilians who held higher ranks than the regulars.[89] The initial groups of furloughed pilots who were working as cooks and chauffeurs while awaiting the beginning of flight training in Issoudun were outraged when pilots who had graduated from the recently constructed schools in the United States began showing up in France with higher ranks and better training. Pilots on the front were loath to take direction from staff officers who refused to even step foot in an airplane. Ground officers on the staff accused the pilots of being temperamental and lacking a sense of teamwork and self-discipline.[90]

To make matters worse, on 28 March, Bolling was ambushed and killed by German troops while inspecting combat operations in preparation for his transition to command of II Corps's air arm later that spring. Pershing had been using Bolling's extensive logistical experience to "take some of the pressure off Foulois and bring form and structure to the acquisition of aircraft and air-related materiel."[91] The loss of Bolling resulted in further confusion at Air Service headquarters since the search for his replacement began at the same time as the suspension of Air Service personnel to France in response to the German offensive. The Air Service staff's inability to form an effective organization, combined with the loss of key personnel and production delays in both France and the United States, threatened to derail the American Expeditionary Forces' aviation program. On 29 May 1918 Pershing relieved Foulois as chief of Air

Service and replaced him with Brig Gen Mason Patrick, who was the senior Corps of Engineers officer in France.[92] However, the reason why Pershing replaced Foulois with Patrick depends on whom you ask.

Foulois, in his writings, insisted that he asked to be relieved of his duties as chief of Air Service to focus on leading combat operations at the front. By May the primary duties of the chief of Air Service consisted of managing construction and logistics programs, and Foulois knew that once American squadrons entered into combat in quantity, he would have little time to oversee the fighting on the front in the zone of the advance.[93] Foulois notes in his memoirs, "My value, as I analyzed the situation, lay in my practical experience with planes and pilots—not as a manager of construction projects."[94] On 11 May Foulois asked Pershing to be relieved of his duties and reassigned as chief of Air Service for the First Army. Foulois's other reason for requesting relief as chief of Air Service was his increasing concern about Mitchell's lack of progress in the zone of the advance. Foulois later described the zone of the advance as "a bunch of disorganized men, a bunch of disorganized airplanes—somebody had to put them together, and that was my job[;] I put them together."[95] In his new position as chief of Air Service, First Army, Foulois was determined to "put [his] tactical experience to work and get the coming air squadrons whipped into shape."[96]

Mitchell took a very different view of Foulois's actions as chief of Air Service. From the beginning of their confrontational relationship in France, Mitchell had based most of his opinions about Foulois on rumors. When Foulois arrived in France, Mitchell noted, "Foulois, I am told, had orders from the President to General Pershing to put him in charge of aviation in Europe, even though he was no longer an active pilot. They say he announced before leaving the United States that he would command not only the American services but in a short time [those] of all the Allies as well."[97] Later, when Patrick replaced Foulois, Mitchell made his opinion clear on Foulois's leadership abilities when he commented, "Things had become such a mess in the interior that it was necessary to put somebody in charge of things there in whom General Pershing had confidence."[98] Mitchell's criticism that Foulois was no longer an active pilot was both wrong and ironic. It was wrong because

Foulois was an active flyer throughout his staff tour at the War Department and ironic because at the time of his statement Mitchell was not officially a pilot in the Air Service. Despite his misgivings, Mitchell was initially unconcerned when Foulois became his immediate superior officer as chief of Air Service for the First Army, saying, "As there were no air units in the First Army . . . he would not have very much to do."[99]

Pershing, as commander of the AEF, could no longer ignore the aviation production delays, the lack of coordination between the Air Service staff and his General Staff, and the friction between Foulois and Mitchell. In his memoirs, Pershing notes as early as January 1918, "In the A.E.F., differences of opinion and the consequent lack of cooperation among aviation officers upon whom rested the task of organization and training caused confusion and loss of time."[100] According to Patrick, Pershing's frustrations culminated in May, when he called Patrick to his headquarters and told him, "In all of this Army there is but one thing which is causing me real anxiety. And that is the Air Service. In it there are a lot of good men, but they are running around in circles. Somebody has got to make them go straight. I want you to do the job."[101] Pershing, however, confirms Foulois's claim that he requested to be relieved as chief of Air Service and praises him for his service: "Brigadier General Foulois, at his own request and to assume charge of aviation in the First Army, was to be superseded by Brigadier General Patrick. Foulois' desire to secure general cooperation made him a valuable assistant and but for his experience and his efforts we might not have avoided so many of the pitfalls that lay in our way."[102] Pershing's selection of Patrick to succeed Foulois was a shrewd choice. Pershing had known Patrick for years, beginning with their time together at West Point, and he reasoned that Patrick's seniority would enable him to stand above the conflicts between the many ambitious air officers in the Air Service, almost all of whom (including Foulois and Mitchell) were under the age of 40.[103]

Analysis

Foulois and his group of "carpetbaggers" did the best they could at the monumental task of organizing, training, and

equipping the Air Service, considering their many handicaps including shortages in materiel, manpower, facilities, and, most importantly, aircraft. Even before he left for France, Foulois knew that he would have to populate his staff with many nonflying officers who possessed the necessary executive experience to put together a giant logistics and training organization from scratch. As Foulois explained,

> The lack of knowledge on the part of the General Staff, A.E.F., of the many complex problems involved in the technical, industrial, and tactical organization and development of the Air Service activities, both in the Service of Supplies and in the Zone of the Advance, made it absolutely imperative that the Air Service representatives charged with the co-ordination of our Air Service activities with the policies of the Commander-in-Chief, as announced from General Headquarters, should be men of broad military experience, with General Staff training, and men whose reputations in the Army were such that their views and opinions would carry weight, and receive full and serious consideration.[104]

Foulois was loath to place pilots on his staff because experienced aviators were in short supply at the beginning of the war, and he felt that they could better serve the Air Service as commanders of tactical units on the front. However, Foulois did recruit two pilots for his staff, Lieutenant Colonels Townsend Dodd and Charles Chandler. His selection of Dodd to head the Supply Section was "absolutely necessary during the first few months of our development, due to the fact that he was at that time the only officer in the Air Service, A.E.F. (flying or nonflying) who had had practical experience in the problems of supply, maintenance, and repair of aeroplanes, engines, transportation, etc."[105] Similarly, Foulois recognized Chandler's skills and experience as a balloon officer and placed him in charge of the Balloon Section of the Air Service.

One of the biggest philosophical differences between Foulois and Mitchell was in their views on the optimal composition of the Air Service staff. Mitchell firmly believed that nonaviators had no business commanding flying activities in either the zone of the advance or the interior. In a memorandum to Foulois, Mitchell states, "As to the non-flying officers of superior rank in the Air Service, these in fact have and are exercising direct command over the training and practical use of tactical air units. This is well known to be wrong."[106] He also objected to

Foulois's use of nonaviators as section heads in the Air Service, stating, "In my opinion, non-flying officers should not be entrusted with work they cannot possibly know anything or very little about. It puts the lives of all in the air in jeopardy and creates an extremely bad morale among the flying personnel who have to do the fighting."[107] Mitchell, like many of the other aviators in the zone of the advance, believed that "the men who actually did the work in the air were the younger ones, who had not yet reached the positions they were entitled to in accordance with their ability. So it happened that the upper positions were filled by incompetents from the army and a few from civilian life."[108]

Foulois agreed with Mitchell that, in a perfect world, aviators should man the Air Service from the chief down to the pilot fighting the Germans on the front. However, Foulois knew that he did not live in a perfect world and had to make compromises to build up a staff organization while simultaneously manning tactical squadrons at the front with experienced aviators. To place experienced aviators on the front as quickly as possible, Foulois insisted that "all trained flying officers employed on Air Service activities in the Service of Supplies, would be relieved of such work as rapidly as nonflying officers could be trained to efficiently take their places, and that the flying officers, so relieved, would be sent into the Zone of Advance to command tactical units on the front."[109] Foulois also attempted to alleviate Mitchell's concerns about nonflyers commanding tactical units by directing that "if it became necessary to assign non-flying officers to actual tactical command of Air Service units on the front, such non-flying officer[s] would be required to do a sufficient amount of flying . . . in order to gain actual air experience, as well as to gain and hold the confidence and respect of the personnel under their command."[110] Neither of these directives closed the rift between the two men, and their rivalry only intensified when Pershing assigned Foulois as Mitchell's direct superior in the First Army.

Even as chief of Air Service, Foulois continued his habit of volunteering for additional duties, regardless of their visibility. When Foulois's ship arrived in France in November 1917, his port of call at Brest had been in operation for only 48 hours. The Army commander of the port, Col Lewis Bash, had not yet

received sufficient administrative personnel to process the 12,000 troops arriving in the same convoy as Foulois's staff. Recognizing Bash's need and his own staff's abilities, Foulois immediately put the clerks, stenographers, chauffeurs, and other administrative personnel at Bash's disposal until permanent staff arrived. As Foulois later reflected, "This was the first application of a policy for the future guidance of the Air Service in France . . . to the effect that although we should insist on standing up for our rights at all times, we should also be always considerate [of] the trials and difficulties of other services and lend a helping hand on every possible occasion."[111]

Another of Foulois's initial challenges after arriving in France was resolving the conflict between the Air Service and the Corps of Engineers over the priority of Air Service projects within the AEF's overall construction program. Before Foulois's arrival, Bolling had placed many large orders for construction material directly with the General Staff without coordinating his requirements with the Construction Department of the Corps of Engineers. On several other occasions where Bolling had placed requests with the Construction Department and been disapproved, he had taken his requests directly to Pershing or his chief of staff and secured their approval for priority purchase of materials for the Air Service.[112] Foulois knew that he had limited personnel with which to execute the Air Service's construction plan, calling for construction of 4,749,300 square feet of floor space, and he soon rejected the idea of the Air Service maintaining a separate construction organization from the Corps of Engineers.[113] On 12 December, Foulois recommended to Pershing that the Air Service turn over all construction duties to the Corps of Engineers, which Pershing ordered on 31 December. This new agreement gave the Corps of Engineers authority over all construction in France, while Foulois and the Air Service retained an independent supply system for purely aeronautical materiel.[114] Foulois's resolution of the construction problem again showed his logistical prowess. As he explained, "All Air Service construction personnel and equipment was logically placed under the same jurisdiction [the Corps of Engineers], which resulted in better coordination of effort and undivided responsibility."[115]

Another pressing problem facing Foulois as he assumed command of the Air Service was the pitiful state of the service's training program. When Foulois arrived in November, the Air Service possessed only three flying schools, and all of them had just begun operations the previous month. Of the three, Issoudun was by far the largest and had already earned a reputation among its students as "the worst mud hole in France."[116] Moreover, when Pershing visited Issoudun for an inspection prior to Foulois's arrival, he found that the staff had been equipping the station's offices and staff quarters with expensive carpets and furniture while ignoring the comfort and welfare of the Air Service troops engaged in building the school's facilities.[117] During his inspection tour prior to taking command of the Air Service, Foulois performed his own investigation of the conditions at Issoudun. After confirming Pershing's observations, he immediately relieved the school's commander and assigned a replacement, Maj Carl "Tooey" Spaatz.[118] Foulois was an excellent judge of character (Spaatz was another of Foulois's 1st Aero Squadron pilots), and by 1 January 1918, Issoudun "was beginning to dig itself out of the mire, and to turn out excellent pilots for pursuit at the front."[119]

The Air Service's Training Section, under Foulois's guidance, provided two invaluable services for new American pilots attending final or refresher training before their assignment to the front. First, it brought British and French pilots with extensive experience on the front to the schools as instructors, providing student pilots with the latest tactics and maneuvers used by both Germany and the Allies. Second, final flight training was accomplished in frontline pursuit and observation aircraft not available in the United States, giving American pilots experience in the types of aircraft they would fly over the front.[120] This system of instructing students in the tactics and employment of their operational aircraft before they reported to their combat units remains in use today by both the US Air Force and the US Navy. Another innovation at Issoudun was the practice of assigning members of each graduating class to remain at the school to teach newer students, which allowed the school to rapidly expand its operations.[121] The Army Air Corps revived this method for rapid expansion of aviation training and mass production of pilots during World War II, and the

United States Air Force continues the practice today with its First Assignment Instructor Pilot program.

Foulois's experience with inadequate aircraft during the Mexican Punitive Expedition, while painful, paid him many dividends in France as chief of Air Service. When the first American-built DH-4 aircraft with the Liberty engine arrived in France on 13 May 1918, he immediately dispatched Dodd, who had flown with Foulois on the first reconnaissance flight into Mexico during the expedition, to the Romorantin facility to thoroughly inspect the machine and determine its ability to survive combat operations over the front. Dodd reported back to Foulois with a detailed list of all the modifications and improvements that American manufacturers needed to incorporate before the airplanes "could be used on the front with a maximum amount of safety for the flying personnel and a maximum amount of efficiency in service operation."[122] Foulois and Dodd concluded that the DH-4 was a sound design and—after American manufacturers incorporated their improvements—the aircraft performed admirably in combat, with pilots stating that above 15,000 feet, it was the fastest airplane on the western front.[123]

While chief of the Air Service, Foulois also spent time developing his theories on the strategic and tactical uses of the airplane, though he encountered much difficulty in implementing his ideas. On 28 November 1917, Maj Edgar Gorrell, yet another of Foulois's pilots in the Mexican Expedition, submitted to Foulois a plan for the strategic bombardment of Germany. The innovative plan was composed of three parts: hindering the efforts of enemy ground troops opposing Allied ground units, attacking enemy troop reserves and supply depots beyond the range of friendly artillery, and destroying enemy industrial strength through "bomb-dropping against the commercial centers of Germany."[124] Gorrell's plan was the first ever by an American Airman that sought to use airpower as a strategic weapon, attacking the heart of the enemy's industrial production while independent of the actions of ground forces.[125] Foulois enthusiastically embraced the idea and, in a 1 December memo to the chief of staff, recommended that "a comprehensive plan of air operations (*including bombing*) be authorized at once . . . in order that fighting *and bombing* operations in cooperation with the French and British Flying Corps may be

carried on at the earliest practicable date" (emphasis added).[126] Foulois was quick to grasp the potential of strategic bombing, but he knew he would need to wait until the Air Service had built a sufficiently large bomber force to act on Gorrell's plan, which—given the state of the American aircraft industry at the time—would not occur until late 1918 at the earliest.

While Mitchell and other Air Service pilots embraced the strategic bombing concepts of Gorrell, Hugh Trenchard, and Giulio Douhet, the General Staff did not. In response to Foulois's and Patrick's request for permission to engage in independent bombing operations with the British Royal Flying Corps, the General Staff flatly denied the request, saying, "It is of special importance that the higher officers among our bombing personnel be impressed with the importance of . . . the coordination of all efforts, to a common tactical end. It is therefore directed that these officers be warned against any idea of independence and that they be taught from the beginning that their efforts must be closely coordinated with those of the remainder of the Air Service and with those of the ground army."[127] Unlike the Air Service's small bomber force of June 1918, the British Air Ministry had placed the Independent Air Force of bombers under Trenchard's command with instructions that he honor the orders of no one except the ministry. Pershing, cognizant of the many sacrifices made by the French to assist the American Air Service during its buildup, chose to support Marshal Ferdinand Foch as the Allied commander in chief and decided that the Air Service could not assist the British Independent Air Force in its efforts against Germany.[128] Foulois would have to wait another 15 years before he could put his strategic bombing theories into practice.

Throughout his tenure as chief of Air Service, Foulois was conflicted over the best way to use his talents to advance the American Air Service's war effort. His experiences as an engineer in the Philippines and Cuba, as the commander of the 1st Aero Squadron in Mexico, and as the driving force behind the plans for the Air Service's massive expansion in France made him the perfect choice to lead the service during its buildup for the projected summer 1918 Allied offensive. He tried to mold his staff of ground officers and recently commissioned civilians into a cohesive organization, but by April he knew that he was

not succeeding. On 30 April, he made a final effort to fix the situation by informing the staff, "There is no activity of the Air Service which can operate without in some way affecting other sections. . . . Hereafter, annoying contentions will be adjusted . . . by the elimination of officers who are unable to work amicably with others to accomplish the difficult mission which should be our sole aim."[129] Ultimately, he knew that he was one of the few experienced aviation unit commanders in France, and he felt that he could better serve the Air Service on the front as a leader of men rather than in Chaumont as a coordinator of construction. However, this was not the last time that Foulois would change his mind about where his talents best served the Air Service.

Benny Foulois learned the hard way that even with copious funding and an audacious plan that looks great on paper, building a world-class air force from scratch in a year is impossible without a preexisting infrastructure that can accommodate the mass production of aircraft, pilots, and mechanics. Upon his arrival in France in November 1917, Foulois attempted to bring order to the chaotic buildup of the Air Service with varying results. In his six months as chief of the Air Service, Foulois made great strides toward creating a smooth-running organization that could produce combat squadrons to support Pershing's ground troops, but shortages in personnel, materiel, and aircraft ultimately frustrated his best efforts. Foulois did his best to adapt his plans to accommodate these shortages, but external strife between his staff and the General Staff and internal strife between his recently commissioned nonflying staff and Billy Mitchell's old guard of pilots doomed his efforts and led to Foulois's and Pershing's mutual agreement that he should step down as chief of the Air Service. The ongoing animosity between Foulois and Mitchell would soon reach its climax as Foulois's next assignment to the chief of the Air Service for the First Army made him Mitchell's direct supervisor.

Notes

1. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 159.
2. Pershing, *My Experiences in the World War*, vol. 1, 155.

3. Ibid., 156.
4. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 159.
5. Hudson, *Hostile Skies*, 52.
6. "Final Report of the Chief of Air Service," 24.
7. Foulois, biography.
8. War Department, "Brief History of the Air Service," 4.
9. "Final Report of the Chief of Air Service," 28.
10. Mitchell, *Memoirs of World War I,* 165.
11. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 161.
12. Ibid. This is an interesting justification given that Foulois himself had never commanded an organization larger than a squadron prior to his selection as chief of Air Service.
13. Foulois, "Air Service," 8.
14. Ibid.
15. Foulois, "Personal Service Record," 44–45.
16. War Department, "Brief History of the Air Service," 5.
17. Patrick, "History of the Air Service," 33.
18. War Department, "Brief History of the Air Service," 6.
19. Patrick, "History of the Air Service," 37.
20. Dunwoody, "Final Report of Assistant Chief of Air Service," 5.
21. Foulois, "Air Service," 10.
22. Patrick, "History of the Air Service," 33.
23. Air Service Production Center Number 2 to Atwood, memorandum, 4.
24. Ibid.
25. Patrick, "History of the Air Service," 34.
26. "Final Report of the Chief of Air Service," 24.
27. Foulois, "Air Service," 14.
28. Satterfield to chief of Air Service, memorandum, 1.
29. Ibid., 2.
30. Ibid., 3.
31. Foulois with Glines, *From the Wright Brothers to the Astronauts,* 161.
32. Foulois, "Air Service," 14.
33. Ibid.
34. Ibid., 17.
35. Ibid.
36. Dunwoody, "Final Report of Assistant Chief of Air Service," 4.
37. Ibid.
38. Foulois, "Air Service," 18.
39. "Final Report of the Chief of Air Service," 30.
40. Dunwoody, "Final Report of Assistant Chief of Air Service," 5.
41. "Final Report of the Chief of Air Service," 30.
42. AFSHRC, "Oral History Interview 766," 35.
43. Ibid., 36.
44. Maurer, *U.S. Air Service in World War I*, vol. 1, 86.
45. Foulois, "Personal Service Record," 56.
46. Patrick, "History of the Air Service," 11. The Bolling Commission also recommended licensing production of the Italian Caproni night bomber, but

American engineers had many difficulties translating the blueprints, and only one Caproni bomber was built prior to the Armistice. Hudson, *Hostile Skies,* 19.

47. Goldberg, *History of the United States Air Force*, 17.
48. Johnson, *Wingless Eagle*, 189.
49. Goldberg, *History of the United States Air Force*, 17.
50. Hudson, *Hostile Skies*, 270.
51. Goldberg, *History of the United States Air Force*, 17.
52. War Department, "Brief History of the Air Service," 3.
53. Patrick, "History of the Air Service," 16.
54. Cooke, *Billy Mitchell*, 67.
55. Goldberg, *History of the United States Air Force*, 19.
56. Foulois, "Air Service," 7.
57. Patrick, "History of the Air Service," 19.
58. AFSHRC, "Oral History Interview 766," 34.
59. Patrick, "History of the Air Service," 20.
60. Hudson, *Hostile Skies*, 31.
61. Patrick, "History of the Air Service," 21.
62. Ibid., 22.
63. War Department, "Brief History of the Air Service," 3.
64. Patrick, "History of the Air Service," 23.
65. "Final Report of the Chief of Air Service," 25.
66. War Department, "Brief History of the Air Service," 4.
67. Foulois, "Personal Service Record," 75.
68. Patrick, "History of the Air Service," 9.
69. War Department to Pershing, cablegram, 17 March 1918, in Foulois, "Air Service," 22.
70. War Department, "Brief History of the Air Service," 6.
71. Patrick, "History of the Air Service," 10.
72. Johnson, *Wingless Eagle*, 192.
73. House Committee, *Hearings*, vol. 2, 479.
74. Foulois, "Personal Service Record," 91.
75. Ibid., 117.
76. Ibid.
77. Ibid., 66.
78. Ibid., 67.
79. Ibid.
80. Ibid., 68.
81. Pershing, *My Experiences in the World War*, vol. 2, 125.
82. Goldberg, *History of the United States Air Force*, 23.
83. Maurer, *U.S. Air Service in World War I*, vol. 1, 18; and Foulois, "Air Service," 41.
84. Maurer, *U.S. Air Service in World War I*, vol. 1, 67.
85. Foulois, "Air Service," 25.
86. Ibid., 26.
87. Ibid.
88. *Official Record of the United States' Part in the Great War*, 111.
89. Shiner, *Foulois and the U.S. Army Air Corps*, 9.

90. Hudson, *Hostile Skies*, 56.
91. Cooke, *Billy Mitchell*, 70.
92. Craven and Cate, *Army Air Forces in World War II*, 11.
93. Foulois, "Air Service," 35.
94. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 171.
95. Shaughnessy, "Flight Interview," 38.
96. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 171.
97. Mitchell, *Memoirs of World War I*, 165.
98. Ibid., 205.
99. Ibid.
100. Pershing, *My Experiences in the World War*, vol. 1, 285.
101. Patrick, *United States in the Air*, 6.
102. Pershing, *My Experiences in the World War*, vol. 2, 50.
103. Goldberg, *History of the United States Air Force*, 22.
104. Foulois, "Personal Service Record," 130.
105. Ibid.
106. Foulois, "Air Service," attachment D, 9.
107. Ibid.
108. Mitchell, *Memoirs of World War I,* 176.
109. Foulois, "Personal Service Record," 129.
110. Ibid.
111. Ibid., 10.
112. Foulois, "Air Service," attachment B, 1.
113. War Department, "Brief History of the Air Service," 4.
114. Ibid.
115. Foulois, "Air Service," 9.
116. Patrick, "History of the Air Service," 17.
117. Foulois, "Air Service," attachment A, 1.
118. Copp, *Few Great Captains*, 27.
119. Patrick, "History of the Air Service," 17.
120. Goldberg, *History of the United States Air Force*, 20.
121. Hinton, *Air Victory*, 26.
122. Foulois, "Air Service," 11.
123. Ibid. Although many pilots who flew the DH-4 called it a "flying coffin," Edgar Gorrell disagreed with their assessment, saying, "The use of the incendiary bullet was a universal, regular means of attack. . . . Of the 289 planes lost by the AEF in combat, 33 went down in flames. Of these 33, only 8 were DH-4's. . . . Of the 237 men killed in action, only 16 went down in flames in DH-4's, 7 per cent. . . . No greater percentage of DH-4's were lost in flames than was true of any other type at the front." Hinton, *Air Victory*, 35–36.
124. Johnson, *Wingless Eagle*, 187; and Maurer, *U.S. Air Service in World War I*, vol. 2, 143.
125. Copp, *Few Great Captains,* 20.
126. Foulois, "Personal Service Record," 12.
127. Maurer, *U.S. Air Service in World War I*, vol. 2, 192.
128. Ibid., 153.
129. Foulois, "Air Service," 28.

Chapter 5

To the Front and Back (1918–67)

In June 1918 Foulois finally received his chance to satisfy his "personal desire to lead America's combat arm in battle."[1] However, within two months, he had resigned his position as commander of the First Army's air arm, recommended a bitter rival as his replacement, and returned to the Air Service staff to finish the training and logistics expansion plan he had started the year before. How did Foulois's experiences as a combat leader and logistician affect his later career? During his brief time as commander of the Air Service's combat arm, Foulois saw the effects of the Services of Supply's inability to provide timely reinforcements and supplies to his pilots on the front and used that knowledge as a guide for repairing the supply "pipelines" that were "leaking badly."[2] After the war, Foulois reverted to his prewar rank and spent the next 12 years working his way back to the top of the air arm, only to spend his four years as chief of the Air Corps mired in controversy and conflict. Although he retired from the service as a pariah among his peers, he left an indelible mark on the Air Corps and laid a solid foundation for its massive expansion six years later as America once again entered into a world war.

Foulois on the Western Front

On 3 June 1918, Foulois reported to Toul as the chief of Air Service for the newly formed First Army of the American Expeditionary Forces. Foulois's new position effectively demoted Mitchell, then serving as chief of Air Service of I Corps, placing Mitchell in the position of having to report directly to a man whom he intensely disliked. The first meeting between superior and subordinate did not go well. In his memoirs, Foulois described the encounter:

> When I entered his luxurious (for those days) office, he greeted me coldly, like a school principal being visited by the head of the PTA.

> "There's no use beating around the bush, Billy," I told him. "I'm here to take over your office, your files, and your job. You are relieved as of this moment."
>
> The expression on Mitchell's face was pathetic. He turned gray and his jaw sagged open in shock as if I had kicked him in the groin. . . . . He began a loud monologue about how I had been out to get him ever since I had been promoted to brigadier general. When I tried to interrupt to refute his allegations, he babbled on almost incoherently and burst into tears like an immature child. [Lt Col Frank] Lahm and I were embarrassed for him, but his actions only proved to me that he was indeed unfit to command.[3]

Lahm, whom Foulois had selected for his staff as the new air chief for the First Army, describes the incident in his diary and seems to back up the essence of Foulois's claims,

> We went to Mitchell's office—he was pretty sick over the proposition, but said he would move out at any time . . . . Mitchell and Heintzelman came in from lunch and the transfer took place—it was almost tragic. Gen. Liggett's instructions were definite. Everything was to be turned over that was needed. F. [Foulois] interpreted it to mean practically everything. Mitchell first named one thing, then another—then the personnel . . . . Finally it came down to his own desk which he said he had had for some time—he was told to keep it, but the men broke it up in trying to move it, so Mitchell finally said he did not want it.[4]

For Foulois, Mitchell's petulant behavior during the transfer of command was the last straw. The next day, 4 June, Foulois wrote a memorandum to General Pershing in which he requested that Mitchell be immediately relieved of duty and returned to the United States for observation and medical treatment. In his memorandum, Foulois notes,

> Colonel Mitchell, during the past year, has had considerable hard field service in France, and from my personal knowledge, has on numerous occasions performed excellent service, particularly during the past month. His actions during the past two days, however, firmly convince me that he is either mentally unfitted for further field service, or is incapable of working in harmony with myself, in carrying out the policy of the Commander-in-Chief.[5]

Four days later, Foulois received a reply from Brig Gen J. W. McAndrews, Pershing's chief of staff, stating that Pershing had spoken personally to Mitchell about the matter and that further insubordination toward Foulois would not be tolerated. In addition,

McAndrews relayed Pershing's wishes that Foulois "meet Colonel Mitchell more than half way on this matter," adding, "The fact that you have been his junior and are now his senior makes it possible for you to afford to do this."[6] Though the two would never be friends, they at least managed to establish a truce, and Foulois decided to give Mitchell a chance to prove his theories and talents as an air commander during the approaching Chateau-Thierry operation.

In mid-June, Foulois formed the 1st Air Brigade, composed of all the tactical units under his command and placed Mitchell in command. He then ordered Mitchell to proceed to Chateau-Thierry "for duty in connection with the tactical and technical supervision of all Air Service units designated for service in that area."[7] Once again, Foulois had to rein in Mitchell's propensity to take personal control of all Air Service units he encountered, and in a memorandum on 1 July, Foulois warned him that "your own position as Brigade Commander is not construed . . . as giving you control over the Air units of the Corps except as directed by the Corps commander."[8] In his memorandum of 4 July, Mitchell professionally responded to Foulois's instructions, in which he acknowledged Foulois's concerns, provided reasons for his actions, and promised, "The Air Service Brigade now attached to the Corps will work as directed by the Corps Commander under the tactical orders of the VI French Army, with which it has established [and] maintains close liaison."[9] After reviewing Mitchell's actions at Chateau-Thierry, Foulois found that Mitchell had overruled the orders of tactical Air Service commanders on several occasions and had given orders directly to subordinate units without following his established chain of command. However, after taking into account the inexperience of Mitchell's subordinate commanders and the fluid nature of the air war over the front, Foulois concluded that he would probably have taken the same actions and subsequently defended Mitchell's actions to Pershing's inspector general, who was investigating the matter.[10]

During the Chateau-Thierry campaign, Foulois also encountered many problems with the Air Service's efforts to keep his squadrons at the front supplied with replacement airplanes and personnel. He saw great wastage in both airplanes and engines with insufficient back shop capacity for the salvage

and repair of damaged airplanes and motor vehicles.[11] Patrick's headquarters, by this time, had also informed Foulois that the Air Service's next operations were to commence later that summer in the Toul sector. If the Services of Supply was having so many problems resupplying his forces at Chateau-Thierry, located only 45 miles from major supply centers, how could his squadrons at the front possibly receive adequate support when they would soon be 300 to 400 miles from Air Service supply depots? Based on his experiences as chief of Air Service, Foulois knew that the Services of Supply needed to build additional depots and repair shops closer to the front in the Toul sector to rein in the wastage and delay in resupplying frontline units. He also knew that he was the best man to take on this responsibility.[12]

On 25 July, Foulois wrote a memorandum to Pershing in which he requested relief as chief of Air Service, First Army, and recommended that Mitchell take his place. In the memorandum, Foulois praised Mitchell's performance, stating, "I am glad to say that the technical and tactical supervision exercised over these units by Colonel Mitchell has resulted in a minimum loss of life, a maximum effective use of material available, and a high fighting spirit of morale which will be most beneficial in establishing the standard of efficiency for all new Air Service units now organizing and to be organized in the future."[13] Foulois gives three reasons for his recommendation of Mitchell to replace him. First, he wanted to show Mitchell that in spite of their different leadership styles, he still appreciated and recognized Mitchell's talents as an air commander. Second, he recalled Pershing's request to "meet Colonel Mitchell more than half way" and determined the needs of the Air Service were best served with Mitchell commanding the First Army's Air Service and Foulois returning to the staff to work logistics and training issues. Finally, and most importantly, Foulois realized that the Services of Supply's progress in building the Air Service's infrastructure was "not up to the point where they should have been at that date. . . . *The responsibility for this lagging in development of Air Service activities rests fully upon myself*, and not upon General Patrick" (emphasis added).[14] Foulois felt personally responsible for the Services of Supply's failures, and he wanted a chance to fix them and finish what he started in 1917.

After Pershing granted his request for relief as chief of Air Service of First Army, Foulois spoke with Patrick and lobbied for a position as the assistant chief of Air Service in charge of logistics. Foulois saw the excessive losses both in combat and in ferrying aircraft between depots and the front, and he calculated that the Air Service could not execute the upcoming St. Mihiel and Argonne operations with the remaining equipment. Foulois knew all the aircraft manufacturers in France, England, and Italy; how much materiel they could produce; and how much additional materiel he could squeeze out of them to provide supplies for the upcoming American offensives. Ultimately, Foulois wanted the job because, while Patrick was an outstanding leader, like Mitchell, he knew nothing about aviation logistics, and Foulois believed he was needed on the staff to fix the supply lines.[15]

Back to the Air Service Staff

On 5 August, Foulois reported to Patrick for duty as assistant to the chief of Air Service. Patrick, in an office memorandum of the same date, charged Foulois with supervising the final or combat training of all air units headed for the zone of advance and to investigate the current training and logistics programs "to insure efficient, uniform, and co-ordinated use of all combat air service personnel in the American E.F." He also recommended the final assignments for all Air Service personnel and units arriving in France from the United States.[16] Foulois immediately moved his staff offices to Colombey-les-Belles to better supervise and expedite the delivery of men and materiel to units at the front.

After inspecting several First Army units in mid-August, Foulois understood the lack of coordination between units in the zone of advance and the Services of Supply. Foulois noted that every Air Service squadron at the front dealt individually with the Supply Section in Paris and the Training Section in Tours with no coordination between squadrons at the front. Furthermore, many of the squadrons at the front were commanded by inexperienced flyers who tended to overestimate their materiel needs and ended up making many unreasonable requests of the Services of Supply. It was unable to determine

which requests were legitimate and which were exaggerations and tried to fill all of them, resulting in much confusion and delay.[17] On 25 August, Foulois discovered that the St. Mihiel offensive would soon commence and that Pershing would call on the Air Service to support ground operations on a scale never attempted before. He knew that he had to solve the supply and personnel problems and quickly. On 27 August, he met with Pershing and Patrick, outlined the supply situation, and provided his recommendations to prepare the Services of Supply for expanded offensive operations. Later that day, Pershing's office published General Order Number 142, redesignating Foulois as assistant chief of Air Service, zone of the advance, and gave him three directives. First, Pershing's order created a General Headquarters Reserve, composed of all Air Service units outside of the zone of advance. Second, every unit in the Services of Supply, after completing combat training, was required to report to Foulois, who would determine the unit's final assignment within the zone of advance. Finally, all requests for replacement of flying personnel or aviation materiel from combat units required the approval of Foulois's office.[18] These moves gave Foulois direct control of all flying units not committed to combat and allowed him to coordinate the resupply of combat units on the front, effectively "plugging the pipeline all the way through" from the Services of Supply to the zone of advance.[19]

The results of these drastic measures were immediate and beneficial for all parties. Foulois notes, "All requests for personnel and material from the Air Service units on the front were promptly handled by officers at the front, who were not only thoroughly familiar with conditions at the front, but also were thoroughly familiar with the available supply of personnel and material in the Service of Supplies [sic], with the result that excessive demands on the Service of Supplies were checked and all necessary and urgent cases were promptly coordinated and sent through."[20] The measures also reduced the friction between unit supply officers at the front and the Supply Section in Paris, as Foulois's office was able to filter out exaggerated requests from the front, consolidate requests for collocated units, and provide better overall service while eliminating "the then existing feeling of uncertainty and irritation" between the two groups.[21]

Foulois also made structural changes to the Services of Supply to provide faster and more efficient service to units in the zone of advance. First, he stripped Services of Supply warehouses and training units all over France and built a tactical reserve of airplanes, engines, spare parts, mechanics, and pilots at Colombey-les-Belles with which he was able to resupply or reinforce all combat units in the Toul and Verdun areas within hours instead of days.[22] During the St. Mihiel offensive, Patrick informed Foulois that the Air Service's next operations would be moving to the Argonne Forest region, a significant distance from existing Services of Supply depots. To solve this potential problem with the timely supply of combat units, Foulois ordered the construction of the Advance Air Depot at Behonne (see figure 1 in the previous chapter). Completed in time for the Meuse-Argonne Offensive in September, the Behonne depot provided timely resupply and replacement materiel to Air Service units for the remainder of the war.

Another problem Foulois addressed while assistant chief of the Air Service was the growing backlog of damaged airplanes and engines that required salvage or repair. Previous uncertainty about the possibility of abandoning the air depot at Colombey-les-Belles in the face of the German Offensive of March 1918 resulted in a slowdown of the depot's development and expansion. When the St. Mihiel operation began in early September, Colombey-les-Belles had neither the tools nor the equipment to repair the projected increase in damaged airplanes resulting from the growing size and scope of Air Service combat operations. Foulois tried to fix this situation by marshalling additional repair equipment and personnel ahead of the offensive. By the end of August, he increased the output of repaired airplanes by 40 percent and of repaired engines by almost 100 percent. Unfortunately, the Colombey-les-Belles depot was simply not large enough to handle the influx of additional repair work, and Foulois had to send a significant number of airplanes and engines further back to the more robust facilities at Romorantin.[23] Foulois also noted that the First Air Depot could have processed more aircraft from August through October if he had obtained more spare parts from America and from the French. The main problem with the supply of DH-4 parts from America was that American aviation manufacturers produced them in the wrong

proportions. According to the assistant chief of the Supply Section, "The supply of flying surfaces was always ample, in fact excessive, while the supply of certain other parts, more particularly landing gears, was always short. This was a result of improper proportion in the production, delivery, and shipment to France."[24] The supply of spare parts for Air Service aircraft procured from the French was insufficient because both the Americans and the French drew from the same pool of aviation parts suppliers in Paris. Those suppliers were loath to manufacture spare parts when they could contract for entire aircraft instead.[25]

To bring the problem of sufficient spare parts further under control, in October 1918, Foulois created a corps of inspectors to travel to squadrons in the zone of advance and examine their maintenance and repair of airplanes and materiel. From his experience as commander of the First Army's Air Service, he knew that over 90 percent of squadrons on the front were commanded by young first lieutenants with less than six months' experience in flying operations and practically no knowledge of aviation logistics and supply. These inspectors, who had no authority to command the correction of deficiencies, interviewed a squadron's leadership and determined what problems the squadron was facing. The inspectors would then provide advice and counseling to the young squadron commander, effectively making them instructors instead of inspectors. This program eliminated much of the hoarding problem by assuring squadron commanders that the Services of Supply would reliably provide sufficient materiel on demand and resulted in increased stocks of spare parts and other supplies at the Air Depot centers.[26]

From August through the end of the war on 11 November, Foulois played a prominent role in repairing the broken supply and training programs in the Services of Supply. As James Hudson notes, "Although he took only an indirect part in making the operational decisions, those decisions would have had little chance of being carried out successfully without his skill in providing the necessary manpower and equipment."[27] Foulois's duties did not end with the armistice. For the next several months, he guided the demobilization efforts of the Services of Supply and the closing of the many facilities under his command in preparation for the disbanding of the American Expeditionary Forces and their return to the United States.

America's Record of Accomplishment

When the United States entered the war in April 1917, the Aviation Section of the Signal Corps owned a single squadron of obsolete JN-4 aircraft and fewer than 50 experienced pilots. Although the Air Service fell far short of the 260-squadron and 202-squadron plans of 1917 and 1918, by 11 November it had assembled a small but effective combat organization with the promise of further expansion through 1919. As shown in figure 2, the Air Service was able to field 45 combat squadrons through November 1918 with 20 pursuit, 18 observation, and six day

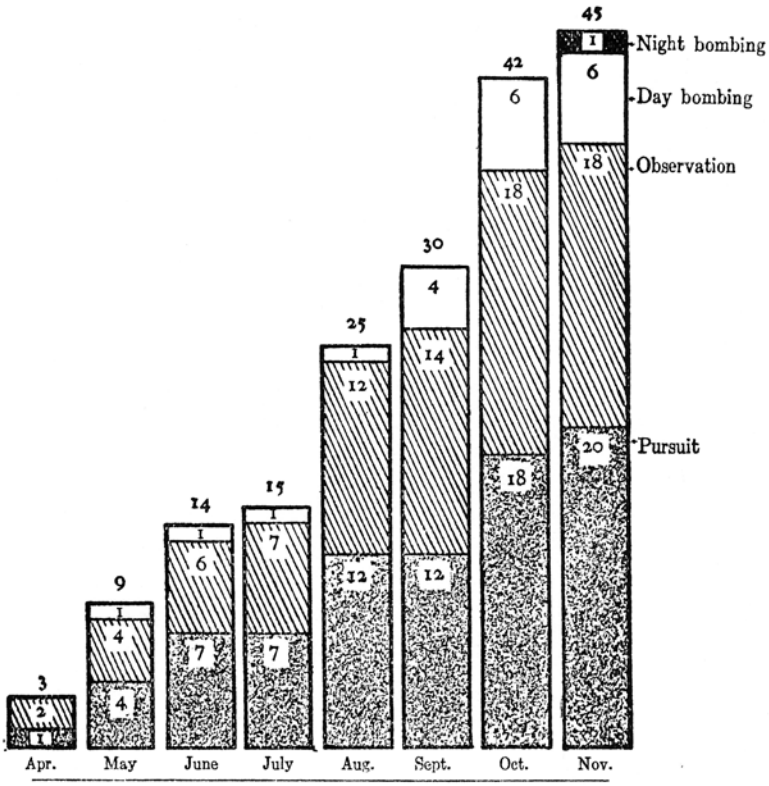


Figure 2. American combat squadrons on the front by month. (Reprinted from *The Official Record of the United States' Part in the Great War* [New York: Parke, Austin, and Lepscomb, 1923], 102.)

bombardment squadrons and one night bombardment squadron in service on the day of the armistice. Additionally, the Air Service had 23 balloon companies assigned to the AEF's ground armies.

The massive expansion of the American aviation industry that the Aviation Section, Congress, and the American people envisioned ended the war as a colossal failure. America had sent only 1,213 DH-4 aircraft and 2,083 Liberty engines to France, a far cry from the 12,000 combat aircraft that Foulois had programmed in his $640 million plan.[28] As shown in figure 3, these numbers paled in comparison to the Allied contributions to the Air Service in France, where the French alone turned over 4,783 planes and 6,270 engines to the Air Service for use in training and combat.[29] Col Halsey Dunwoody, the assistant chief of Air Service, Paris, succinctly summed up the reason for "failure" of the Air Service's expansion program when he stated in his report, "The greatest fault, if fault there was, was a misconception in the minds of those who expected the impossible."[30]

At the end of the war, the Air Service had 58,090 officers and enlisted men in France, with 32,396 in the Services of Supply. Another 20,072 Air Service personnel performed duties in England and 171 in Italy, for a total wartime Air Service strength of 78,333.[31] Combined with the training, logistics, and administrative personnel in the United States, the Air Service grew from a prewar strength of less than 1,200 to over 200,000 by war's end, a proportional increase that far outstripped ground Army and Navy expansions.[32]

Of the 200,000 Air Service personnel, 1,402 pilots, 769 observers, and 252 balloonists were assigned to the zone of advance during the war. On 11 November, 767 pilots, 481 observers, and 740 airplanes comprised the 45 combat squadrons on the front. According to Patrick, "The flying personnel trained in the Air Service schools [were] second to none in the world for aggressiveness and skill."[33] The Air Service's official kill-loss record seems to prove Patrick correct. Throughout the war, American pilots claimed 704 enemy airplanes and 72 balloons while losing only 289 aircraft, resulting in a kill-to-loss ratio of almost two-and-a-half to one. However, losses among American pilots were sobering; of the 1,402 pilots who participated in combat operations, 586 were killed, wounded, or missing by the end of the war.[34]

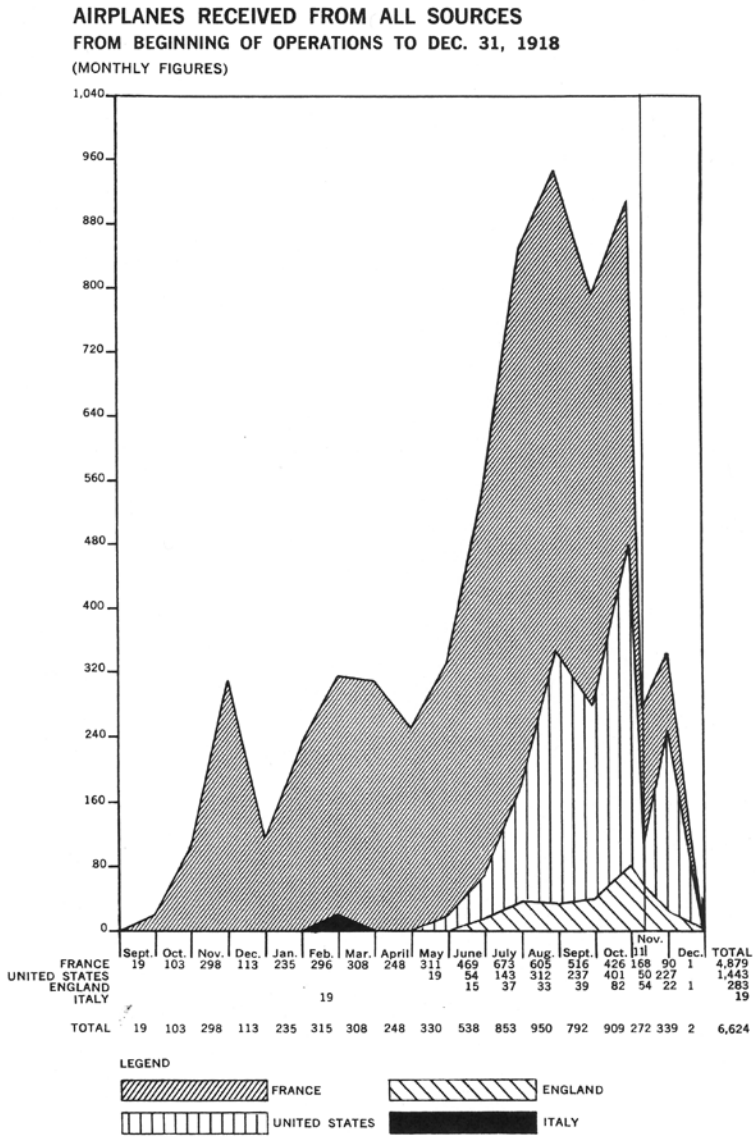


Figure 3. **Deliveries of Air Service aircraft by country and month.** (Reprinted from Maurer Maurer, *The U.S. Air Service in World War I*, vol. 1 [Washington, DC: Office of Air Force History, US Air Force, 1978], 66.)

Back in the United States, the Aviation Section expanded from two to 27 training airfields during the course of the war. They produced 8,639 pilot graduates from primary flight training and 6,331 from advanced training. To support the massive increase in domestic pilot training, American aircraft companies produced 5,346 primary training airplanes and 2,474 advanced planes. Though these numbers are impressive, they are well below the 22,625 aircraft called for in Foulois's 1917 plan. To build these aircraft and to assist the Allies, the American forestry industry produced over 174,000,000 board feet of spruce and fir, with two-thirds exported to the Allies.[35]

In March 1919, Pershing ordered Foulois to Paris and made him a member of the committee charged with drafting the Convention for the International Rules and Regulations of Air Navigation, which eventually became part of the terms of the Treaty of Versailles.[36] A month later, Pershing designated him to head the American Section of the Aeronautical Inter-Allied Commission of Control, which the treaty charged with carrying out the Air Service–related terms of the treaty. However, President Wilson instructed the previous January that no American could enter Germany until the US Senate ratified the Treaty of Versailles, so Foulois was unable to carry out his duties. The Senate never ratified the treaty, and the American Section disbanded later that spring. His work complete, on 5 July 1919 Foulois returned to the United States, where he promptly reverted to his prewar permanent rank of captain of infantry and the temporary rank of major in the Air Service.[37] Foulois was not alone—"World War I aviation generals reverted to being captains and majors once more and the peacetime Air Service began a new era of its history. It would be a time dominated for a decade by the ambivalent legacy of the First World War—a tension between a fantasy of what could have been and the grim recollection of what actually happened."[38]

Foulois's Second Rise and Fall as Chief of the Air Arm

After his return to the United States, the War Department assigned Foulois as chief of the Liquidation Division in the Office

of the Chief of the Air Service, where he terminated and resolved all outstanding aviation-related war contracts with the Air Service's foreign and domestic suppliers. He and his staff also assisted, under protest, in the dismantling of the wartime Air Service to its prewar levels, resulting in severe reductions in personnel and equipment. While the Army drew down the Air Service from a wartime high of 20,000 officers in the United States and France to just over 200 officers by the end of 1919, Foulois and his fellow aviators began lobbying Congress for the creation of an independent air force.[39]

Throughout the fall and winter of 1919, congressional supporters of the Air Service introduced several bills that would consolidate to varying degrees all Army and Navy aviation under an independent third service coequal with the other two services. Testimony at the hearing followed a predictable pattern. Ranking Army generals and Navy admirals vehemently opposed independence, while Foulois and his fellow Army aviators favored a separate air arm. Foulois's harshest testimony was on 7 October 1919 before the House Committee on Military Affairs, where he blasted the War Department and General Staff as ill suited to guide the future of military aviation:

> The greater part of the development and use of aviation in the United States for the past 11 years has been under the control and supervision of the War Department. In view of this fact, I frankly state that in my opinion the War Department through its policy-making body, the General Staff of the Army, is primarily responsible for the present unsatisfactory, disorganized, and most critical situation which now exists in all aviation matter throughout the United States.
>
> In my opinion the situation is so critical, especially in connection with the present physical condition of the aircraft industry, that I am inclined to believe that no matter what restoratives are used, the patient will probably die on your hands, or at the most, will only be saved through the application of prompt and most drastic treatment.[40]

Foulois went on to criticize the Army's lack of funding for aviation by juxtaposing Gen Peyton March's statement to Congress on 29 May 1919—"The Air Service is a great big arm, a fourth arm of equal importance with the other branches of the service,"—with the precipitous drawdown of the air arm during the same period.[41] In similar testimony before the Senate on 16 October, Foulois attacked Assistant Secretary of the Navy

Franklin Roosevelt for presenting incorrect facts and biased opinions concerning the need for naval aviation to remain with the Navy.[42] Foulois's criticism of Roosevelt in front of Congress would have severe ramifications years later during his tenure as chief of the Air Corps.

After his congressional testimonies, Foulois knew that he had made many enemies on the General Staff through his criticisms and pushes for independence, so he decided to leave town until the tensions between them relaxed. Foulois had the added incentive in the form of his wife's request for a divorce, which became official in 1921.[43] On 8 April 1920, the War Department relieved Foulois of duty in the Liquidation Division and assigned him as an assistant military attaché at The Hague, Netherlands, with duty as a military observer in Berlin.[44] However, since the United States never ratified the Treaty of Versailles, the Allies denied him access to all official German air intelligence information obtained by the French, British, and Italians. Undaunted, Foulois made many unofficial inquiries with German pilots and aviation industry executives and soon became drinking friends with Hermann Goering and Ernst Udet.[45] Foulois's wartime record and his disassociation with the Allied mission to Germany earned him the respect and friendship of many of Germany's top aviation engineers, executives, and operators. By the end of his tour in 1924, he had amassed an impressive list of contacts, including Dr. Hugo Junkers, Gustav Krupp, Dr. Theodore von Kármán, Claudius Dornier, Ernst Heinkel, and Anthony W. Fokker.[46] Unfortunately, the Air Service, due to its lack of interest and shortage of intelligence personnel, never examined or exploited the massive amounts of intelligence on German aviation advances and plans Foulois forwarded to the United States during his time in Europe, and the documents eventually were destroyed. However, perhaps the most notable event of Foulois's Berlin tour was that two weeks before he returned to the United States in 1924, he married Elizabeth Grant, a native of Philadelphia who was working as a secretary in the American embassy.[47] The two would remain married for the next 35 years.

After his promotions to major in 1920 and lieutenant colonel in 1923, Foulois applied and was accepted to the Army's Command and General Staff School in 1924.[48] In 1925 he found

out that Mitchell was about to lose his job as the assistant chief of Air Service, so Foulois took time out from his studies to mount a letter-writing campaign to the General Staff and the Air Service to get appointed as his replacement. The War Department passed over Foulois for the job in favor of Lt Col James Fechet but gave him a significant consolation prize—command of the showplace of Army aviation, Mitchel Field on Long Island, New York, and the 9th Observation Group.[49]

During the summer of 1927, Patrick announced his retirement as chief of the Air Corps, and the War Department named Fechet to replace him. From his command at Mitchel Field, Foulois again campaigned for the assistant chief of the Air Corps job, writing to anyone who might have been in a position to help him, including the governor of his home state of Connecticut.[50] This time his persistence paid off, and on 28 January 1928, the War Department named him assistant chief of the Air Corps and promoted him (again) to the rank of brigadier general.[51] Foulois then spent the next three-and-a-half years gaining experience in the various divisions of the Air Corps to prepare for the day when he might succeed Fechet as chief. He spent his first 18 months as assistant chief working on war planning and training policy in the Washington offices of the Air Corps. In July 1929, he arranged for a one-year exchange tour with the chief of Air Corps, Materiel Division, at Dayton, Ohio, to familiarize himself with the Air Corps's research and development activities.[52] Foulois returned to his Washington office in July 1930 and spent the next 11 months working on planning and policy matters for the Air Corps.[53]

Foulois's final test as assistant chief of the Air Corps came in May 1931 when Fechet placed him in charge of the Air Corps's annual maneuvers. Determined to prove his leadership and organizational abilities, he formed the 1st Provisional Air Division, composed of 659 aircraft, 720 pilots, and 644 enlisted men from all over the country.[54] From its assembly point in Dayton, the Air Division traveled en masse around the eastern United States, where it performed aerial demonstrations of up to 600 aircraft in 20-mile-long formations over Chicago, New York, and Washington.[55] Foulois personally commanded the armada, frequently flying the lead aircraft of the massive formations. Amazingly, Foulois accomplished the entire series of

maneuvers—38,000 flight hours in all—without a single serious mishap or fatality, earning him the Mackay Trophy for "the most meritorious flight of the year."[56] Foulois's success during the maneuvers was due in no small part to his talented staff, including Frank Andrews as his chief of staff, Tooey Spaatz as his air traffic controller, and Hap Arnold as his chief of supply and logistics.[57]

Foulois's success at the annual maneuvers convinced Fechet of his fitness to command, and he signed off on Foulois's selection as the next chief of the Air Corps. Foulois took over as acting chief on 8 September when Fechet began his terminal leave and officially assumed command of the Air Corps on 22 December 1931 with the rank of major general.[58] Over the next four years, Foulois focused his efforts on two separate but related issues as the top airman in the Army. First, he worked to secure the coastal defense mission for the Air Corps, enabling him to design and build long-range bombers for the ostensible purpose of reinforcing American possessions overseas. If Air Corps policy eventually changed to allow for strategic bombing, Foulois would have on hand a ready-made force to carry out future bombing campaigns. Second, with his dreams of independence dashed by congressional legislation in 1920 and 1926, Foulois eventually set his sights on establishing a GHQ Air Force that would cleave Air Corps combat aircraft from the control of the ground armies and put them in a separate striking force under the control of an airman.

Soon after assuming command, Foulois began his campaign to seize the coastal defense mission for the Air Corps. In 1932 he established a school at Bolling Field and charged it with developing coastal defense navigation and plotting equipment. The school made significant strides over the next two years in developing the tools and training that the Air Corps required to execute the coastal defense mission, but a lack of Army funding limited its long-term contributions.[59] In 1933 he submitted a proposal for Project A, a new long-range reconnaissance bomber that could protect America's distant possessions as well as swiftly fly to either coast to defend against naval attack.[60] Initially, the General Staff was opposed to Foulois's proposal, but Foulois won the support of Army Chief of Staff Douglas MacArthur, who approved the plan in May 1934 over the General

Staff's objections.[61] Project A resulted in the Air Corps's acquisition of the XB-15, but Foulois was unsatisfied with the aircraft's performance and knew that the aviation industry could do better. Later that year, Foulois initiated Project B, calling for a long-range reconnaissance bomber that could carry a 2,000-pound bomb load at 250 miles per hour for 2,200 miles. Foulois's quest for a formidable long-range bomber culminated on 28 July 1935, when the Boeing Company publicly unveiled the XB-17. After preliminary flight tests, Foulois approved the purchase of 13 B-17s for delivery over the next several years. They were the only four-engine bombers in the Air Corps's inventory when his old friend Goering and his Luftwaffe invaded Poland in September 1939.[62]

The events that led to the successful completion of Foulois's quest to form a GHQ Air Force also indirectly led to his downfall as chief of the Air Corps. In February 1934, President Roosevelt was contemplating cancelling the government's airmail contracts with the commercial airlines, which he believed were engaging in illegal collusion and fraudulently obtaining favorable terms from the post office. On 9 February, Second Assistant Postmaster General Harlee Branch met with Foulois and asked him if the Air Corps could fly the airmail if Roosevelt cancelled the contracts with the commercial carriers. Foulois replied that the Air Corps could fly the mail and that he could be ready in "about a week to 10 days."[63] Later that day, Roosevelt announced that he was indeed cancelling the commercial airmail contracts and that the Air Corps would begin airmail service on 19 February. Foulois made two major mistakes that day. First, he told Branch that the Air Corps could take over the airmail service within 10 days without notifying or asking the permission of his superior, MacArthur, who had been blindsided by a reporter concerning Roosevelt's announcement.[64] Second, Foulois committed the Air Corps to flying the mail knowing that few of his pilots had instrument and night-flying experience, few of his aircraft had radios and blind-flying instruments, and both were necessary to fly the airmail routes during the winter.[65] On that fateful day, Foulois allowed his enthusiasm and pride to override caution and reflection.

The results of the Air Corps's three-month experiment in airmail delivery were a public relations disaster. Between 19

February and 1 June, Air Corps mail runs resulted in 66 crashes and 12 deaths, with an abysmal completion rate of 65 percent for scheduled flights.[66] The Air Corps's failure resulted in much embarrassment for Roosevelt, and he in turn blamed Foulois's poor leadership for the fiasco. Roosevelt had not forgotten Foulois's testimony against him over a decade before.

After the airmail fiasco, Foulois tried to keep a low profile in the Army, and he became a model team player with the General Staff. He no longer agitated for independence; his focus instead turned to establishing and staffing a GHQ Air Force. Dismayed by the Air Corps's performance in flying the mail, Congress formed the Baker Board on 17 April 1934 to "make a constructive study of the operation, flying equipment, and training in the Army Air Corps and to determine its adequacy and efficiency in the performance of its missions."[67] After weeks of testimony and months of deliberation, the board recommended that the War Department place the Air Corps's combat forces under a GHQ air force, while keeping the supply and training functions under the Office of the Chief of the Air Corps. On 2 October, Secretary of War George Dern instituted the Baker Board's recommendations, which stripped Foulois of almost his entire combat command and placed those units under the control of the General Staff.[68] While many in the press and the military considered this decision to be a direct rebuff to Foulois, he was able to take the long view of the situation, stating that "this was a compromise and not exactly what we wanted, but it was a step forward [toward independence] and that was better than no step at all."[69]

The airmail fiasco and Foulois's resulting notoriety also captured the attention of the Rogers subcommittee of the House Military Affairs Committee, which Cong. William Rogers formed in March 1934 to look for corruption in Army and Navy procurement practices. When the committee called Foulois to testify about his possibly illegal procurement of aircraft using negotiated contracts instead of competitive bidding, he testily defended his actions, insisting that they were in accordance with the letter of the law and that the judge advocate general had approved all the contracts.[70] Rogers was not swayed by Foulois's arguments. After examining Foulois's earlier testimonies lambasting the General Staff and the War Department for

obstructing progress in aviation, he became convinced that Foulois had repeatedly misled Congress with inaccurate and deceptive statements. Over the next two months, the Rogers committee called senior Army officers to testify against Foulois in closed session, where they refuted his statements and impugned his integrity and fitness to command.[71] On 15 June, the subcommittee charged Foulois with three offenses: violating procurement laws, making misleading statements to Congress, and mismanaging the airmail operation.[72] The subcommittee summarily found him guilty of all three charges and demanded that Dern immediately remove him as chief of the Air Corps.[73]

Foulois was outraged. He immediately demanded a public hearing before the committee and said he would welcome a court-martial to refute the subcommittee's charges. Both MacArthur and Dern backed Foulois, and on 21 August Dern made it clear to the subcommittee that he was not about to fire Foulois based on secret testimony and without a fair trial. He stated, "It does not appear that he was informed of the accusations contained in the report, nor was he confronted by the witnesses against him and given an opportunity . . . to offer evidence in his own defense. Nor was he permitted to be represented by counsel of his own choosing. All these rights are sacred to every American citizen and are guaranteed by the Constitution."[74] The impasse between Rogers and Dern continued until December 1934, when they agreed to hand the matter over to the Army inspector general, who would be allowed access to the secret testimony during his investigation.[75]

On 14 June 1935, the inspector general released his report, exonerating Foulois of all charges save one, "depart[ing] from the ethics and standards of the service by making exaggerated, unfair, and misleading statements to a congressional committee."[76] Foulois considered this a fair outcome, and he accepted a letter of reprimand from Secretary Dern without comment or rebuttal. Rogers saw the report as tantamount to an acquittal, and he continued to criticize Foulois throughout the summer, calling him a "liar and a perjurer" from the floor of the House and threatening to block increased Air Corps appropriations until Foulois was removed as chief.[77]

Foulois had become increasingly concerned about the rise of the Luftwaffe, which Goering had reestablished in March 1935,

and he felt that another war between Germany and the United States was inevitable.[78] He also believed that he had become a lightning rod for congressional criticism of the Air Corps. Rogers had threatened repeatedly to hold up funding for the Air Corps's expansion plans until the War Department removed Foulois from office. Foulois noted in his memoirs, "The feeling that war was inevitable overwhelmed me, but the more I read about the demands of the Rogers Subcommittee to retire, the more I began to feel that the only way the Air Corps was ever going to get the planes to meet the growing threat in Europe in the person of Adolf Hitler was for me to get out of the way."[79] For the good of the Air Corps and to keep his aircraft expansion plans on track, he submitted his retirement papers in September, took three months of terminal leave, and officially retired on 31 December 1935.

When America entered World War II less than six years later, the War Department offered Foulois his commission back, but he refused because it "had a nonproductive desk job in mind."[80] Instead, he ran the New Jersey civil defense program and helped to establish the Civil Air Patrol.[81] In 1959 he moved to Andrews AFB to be with his terminally ill wife. After her death, Air Force Chief of Staff Thomas White invited Foulois to stay at Andrews and serve as a travelling spokesman to promote airpower. Foulois accepted the offer, and he traveled more than a million miles to tell the story of military aviation.[82] Maj Gen Benjamin Delahauf Foulois died at Andrews AFB on 25 April 1967 at the age of 87, having flown with the Wright brothers and having seen the first Apollo missions destined for the moon.[83]

Analysis

Throughout this period of his career, Foulois showed great personal integrity. In July 1918, as the inspector general was investigating Mitchell's actions during the Chateau-Thierry operation, Foulois on his own initiative went to the investigators and informed them he felt that Mitchell had taken appropriate actions and he would have done the same under similar circumstances. As Foulois notes, "But my sense of justice and fair play would not allow me to take such a course of action [withholding his recommendation from the inspector general], al-

though I have been told on numerous occasions since then, that I was too generous and should have allowed Mitchell to eliminate himself by his own actions."[84] By the end of the war, Foulois had developed a great admiration for Mitchell's tactical skill, culminating in his decision to step down as chief of Air Service, First Army, to make way for Mitchell, "something neither Mitchell nor most officers would have done."[85] DeWitt Copp neatly sums up the episode: "Whether he made the move as a tactical retreat in the face of what he realized were superior forces or because he believed his talents were better suited to solving the difficulties of training and supply is not known. Poker was a game Benny Foulois played well."[86] Based on Foulois's many statements on the matter, the answer is most likely "all of the above."

Foulois's experiences with the 1st Aero Squadron in Mexico continued to reap benefits throughout the remainder of the war. While commander of the 1st Aero Squadron, he wrote a prototype manual outlining the description and amount of every spare part a combat squadron should have on hand for deployments, which he later used as a basis for his aviation expansion plan in 1917. The idea of the standardized spare parts manual survived the Air Service's move to France and, combined with "frequent and unexpected visits by competent inspectors who will check the materiel found in the squadron against the lists of materiel which should be there," the manuals resulted in reduced hoarding by squadrons at the front and increased efficiency of the supply system.[87]

Foulois's congressional testimony in October 1919 was another example of how he effectively expressed his discontent with the General Staff without subjecting himself to military sanctions. Because Congress subpoenaed him to testify and directed him to give his personal opinions on Air Service matters, Foulois felt he was free to criticize his superiors and stood ready to defend his actions, as the following exchange during his testimony demonstrates:

> Maj Foulois: I have been in the Army 21 years, and no human being can accuse me of a single act of insubordination or disloyalty to my superiors. If any of my foregoing statements can be construed as insubordinate or prejudicial to good order and military discipline, then I am ready to stand before any military court in the land without fear. . . .

> The Chairman: In that connection, I want to say to you that the Chief of Staff testifying before this committee stated that he welcomed the broadest criticism of the bills that are before the military committees of Congress, so that I take it you are simply living within the promise of the Chief of Staff.
>
> Mr. Miller: And furthermore, Mr. Chairman, that no officer could possibly suffer by reason of giving such views.
>
> The Chairman: Yes; he stated that no officer would be punished for a frank and free expression of his views of the bills that are pending.
>
> Maj Foulois: I will state, Mr. Chairman, that I prepared most of this before that statement was made, and I fully intended to bring it out whether such a statement had been made or would be made.[88]

While Foulois frowned on the General Staff using military assets under his command for promotional stunts to advertise the value of the Air Service to the public, he was not above creating "military exercises" to achieve the same purpose. While the commander of Mitchel Field, Foulois derided participating in public relations activities, such as a pilot flying a DH-4 and tossing a baseball to Babe Ruth from 250 feet in the air.[89] Foulois later testified to Congress, "Well, I might say the chief mission of Mitchel Field has been largely entertaining the populace about New York and the neighboring vicinity, but we are supposed to prepare and train for the defense of New York and its vicinity."[90] Ten years later, as chief of the Air Corps, Foulois embraced the idea of "entertaining the populace" as a way to repair the Air Corps's image after the airmail fiasco. In June 1934, Foulois wanted to show the public the capabilities of the Air Corps's new B-10 bomber by arranging for 10 of the aircraft to deploy to Canada and Alaska and then attempt a first-ever nonstop flight from Alaska to the continental United States. The deployment, led by Hap Arnold, left Bolling Field with much fanfare and flew to Alaska and back (with a reporter from the *Washington Post* on board—Foulois was determined to get good press) without incident.[91]

After his four-year assignment as assistant military attaché in Germany, Foulois became convinced that Germany would once again go to war with the United States, and he took every action in his later career with this in mind. He knew that the future of the Air Corps would be determined by the aircraft it could develop, acquire, and operate.[92] In fact, Foulois's push to

develop a long-range bomber was based on his belief that war between Germany and the United States was inevitable and that "the first phase of the next war is going to be the [German] conquest of Europe, and the second phase is going to the conquest of the United States."[93] With a robust long-range bomber program, the United States would not have to "wait for them to come over here. If we got into trouble with them again, we were going over there."[94] Although he later admitted he probably should not have focused so much on bomber development at the expense of pursuit aviation, he had no regrets about his choice, stating, "My decision then enabled us to have B-17's and B-24's by the time we entered the war in 1941 and provided the basis for the B-29's that ended it in 1945."[95]

The sequence of events of the Air Corps's involvement in the airmail fiasco is similar to that of the 1st Aero Squadron in the Mexican Punitive Expedition. When first approached about the possibility of flying the mail, Foulois saw it as an opportunity to test his men and airplanes in an emergency, to show the public what his pilots could accomplish, and to garner additional funds to procure badly needed airplanes and equipment.[96] He then committed his forces to the operation and found out soon afterward that they had neither the equipment nor the training to execute the mission effectively. The failure of the operation showed Congress and the public how badly the nation's air arm had deteriorated, resulting in additional funding for equipment upgrades and additional training for the pilots.[97] Finally, the improvements to the air arm paid great dividends during the world war that America entered only a few years later.

Although he deserves much of the blame for the Air Corps's poor performance during the airmail fiasco, many historians have undeservedly vilified his statements that the Air Corps was well equipped and trained to fly the mail as "reckless . . . bordering on criminal."[98] Even if Foulois had not told Branch that the Air Corps could fly the mail, the result would have been the same. Earlier that fateful morning, before Foulois's meeting with Branch, Roosevelt asked Dern about the possibility of the Air Corps taking over the airmail routes. Dern "automatically answered in the affirmative. An emergency was an emergency, and any branch of the military called on must be prepared to act."[99] Nor did Foulois callously send his pilots to

their deaths without training or concern for their safety. After the first disastrous week of the airmail operation, Foulois sent a safety message to his zone commanders on 24 February restricting flying at night or in bad weather to experienced pilots only and mandating two-way radio communications for all night flights.[100] When these measures failed to meet the impossible goal of zero accidents and fatalities that Roosevelt imposed on him, on 10 March Foulois stood down operations for 10 days so that mechanics could install new night-flying equipment on his aircraft and his staff could draw up a smaller, safer route structure.[101] While Roosevelt and the General Staff both blamed Foulois for an unacceptable number of deaths during the airmail episode, Foulois knew that the severe weather was to blame for most of the accidents and that the fatality rates were consistent with normal peacetime flying operations. During a visit to Mitchel Field in March 1934, he cited to reporters accident figures for the previous several years. In fiscal years 1932 and 1933 the Air Corps had respectively suffered 50 and 46 flying accident deaths, while thus far in FY 1934 there had been 39 deaths, of which only six occurred in connection with the airmail operation.[102]

During his short tenure as chief of Air Service, First Army, Foulois spent most of his time either dealing with Mitchell's antics or bemoaning the sorry state of the Air Service's supply lines. When he saw that Mitchell really was an outstanding operational commander, Foulois requested that Pershing relieve him as the combat air arm commander and return him to the Services of Supply to finish the job of establishing an efficient logistics infrastructure. After the war, Foulois spent the next decade agitating for independence of the air arm, lying low in Germany to avoid the wrath of the General Staff and slowly reestablishing his credentials as a commander and a logistician. In December 1931, he achieved his goal of heading the Army's air arm a second time and spent the next four years preparing the Air Corps for the next war with Germany, which he believed was inevitable. However, the most notable event for Foulois as chief of the Air Corps was his failure in 1934 deploying his combat-trained air force on short notice to carry commercial airmail, a mission it was neither trained nor equipped to execute. Foulois retired on the last day of 1935 under a cloud

of controversy courtesy of the Rogers subcommittee and refused to have anything to do with the military for the next two and a half decades. In 1959 he once again "joined" the Air Force and spent the remainder of his life passing on his hard-won lessons about airpower to future generations. General Foulois conveyed to his audiences a "deeper message . . . than to remind them of their aviation heritage. He warned again and again about the dangers of complacent thinking, of letting the disease of communism spread, of resting on the laurels of past wars won."[103]

Notes

1. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 175.
2. Foulois, biography.
3. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 172.
4. Lahm, "World War I Diary of Col. Frank P. Lahm," 86–87.
5. Foulois to Bullard, memorandum, 146.
6. Ibid., 147. Mitchell had outranked Foulois before the latter's temporary promotion to brigadier general and arrival in France.
7. Ibid., 148. This organization, where Mitchell commanded all the combat units in the First Army and Foulois and his staff commanded the support and logistics units, became the prototype for the latter reorganization of the Air Corps in 1935 into a GHQ Air Force that operated separately from the Office of the Chief of the Air Corps.
8. Ibid., 149.
9. Ibid., 151.
10. Ibid., 152.
11. Foulois, "Air Service," 36.
12. Ibid., 37.
13. Foulois to Bullard, memorandum, 152.
14. Ibid., 155.
15. AFSHRC, "Oral History Interview 766," 41–42.
16. Foulois to Bullard, memorandum, 157.
17. Ibid.
18. Ibid., 158.
19. AFSHRC, "Oral History Interview 766," 42.
20. Foulois, "Air Service," 37.
21. Ibid., 38.
22. Ibid.
23. Ibid., 39.
24. Satterfield to chief of Air Service, memorandum, 7.
25. Foulois to Bullard, memorandum, 161.
26. Foulois, "Air Service," 40.
27. Hudson, *Hostile Skies,* 139 and following.

28. War Department, "Brief History of the Air Service," 8.
29. Dunwoody, "Final Report of Assistant Chief of Air Service," 5.
30. Ibid., 6.
31. Patrick, "History of the Air Service," 57.
32. *Official Record of the United States' Part in the Great War*, 93.
33. Patrick, *United States in the Air*, 49.
34. War Department, "Brief History of the Air Service," 12.
35. United States Air Service, "Short Account of the U.S. Air Service's Activities."
36. Foulois to Bullard, memorandum, 163.
37. Ibid., 164.
38. Johnson, *Wingless Eagle*, 216. Most, but not all, of the Air Service officers reverted to their former ranks. As Foulois notes in his memoirs, "Those high-ranking officers that [Army Chief of Staff General Peyton] March liked kept their ranks. . . . One of March's favorites was none other than Billy Mitchell, who kept his star as a brigadier general. . . . Mitchell thus became my superior and our rank positions were again reversed." Foulois with Glines, *From the Wright Brothers to the Astronauts*, 185–86.
39. Shiner, "Benjamin D. Foulois," 19.
40. House Committee, *Army Reorganization*, 927.
41. Ibid.
42. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 188.
43. Copp, *Few Great Captains*, 18. Copp also notes, "It was felt by some that Foulois had treated his wife shabbily—a slight that was not forgotten in the upper reaches of the War Department."
44. March, Special Order Number 83-0, 8 April 1920.
45. Shiner, "Benjamin D. Foulois," 21.
46. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 193–94.
47. Copp, *Few Great Captains*, 87.
48. Pugh to Headquarters USAF, memorandum.
49. Shiner, *Foulois and the U.S. Army Air Corps 1931–1935*, 34.
50. Shiner, "Benjamin D. Foulois," 22. The 1926 Air Corps Act renamed the Air Service the Air Corps.
51. Pugh to Headquarters USAF, memorandum. Foulois, in his 37-year career, never held the rank of colonel.
52. Shiner, "Benjamin D. Foulois," 23.
53. Ibid.
54. Copp, *Few Great Captains,* 92.
55. Ibid.
56. Shiner, "Benjamin D. Foulois," 23.
57. Copp, *Few Great Captains,* 93.
58. Pugh to Headquarters USAF, memorandum.
59. Shiner, "Benjamin D. Foulois," 26.
60. Copp, *Few Great Captains,* 323.
61. Shaughnessy, "Flight Interview," 33.
62. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 232.
63. Ibid., 238.

64. Shiner, "Benjamin D. Foulois," 26. MacArthur's reply to the reporter was, "I have the utmost confidence the Army will handle the airmail in a magnificent way" (ibid.).
65. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 242.
66. Shiner, "Benjamin D. Foulois," 31.
67. Historical Division, *Organization of Military Aeronautics*, 93.
68. "Army Air Shake-Up Curbs Gen. Foulois," *New York Times*, 3 October 1934.
69. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 261.
70. Shiner, "Benjamin D. Foulois: In the Beginning," 35.
71. Ibid., 36.
72. Shiner, *Foulois and the U.S. Army Air Corps*, 182.
73. Shiner, "Benjamin D. Foulois," 37.
74. Copp, *Few Great Captains*, 234.
75. Shiner, "Benjamin D. Foulois," 38.
76. Shiner, *Foulois and the U.S. Army Air Corps*, 191.
77. Copp, *Few Great Captains*, 235–36.
78. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 273–74.
79. Ibid.
80. Ibid., 283.
81. Ibid.
82. Shiner, "Benjamin D. Foulois," 40.
83. Pugh to Headquarters USAF, memorandum.
84. Foulois to Bullard, memorandum, 155.
85. Copp, *Few Great Captains*, 21.
86. Ibid.
87. Satterfield to chief of Air Service, memorandum, 5.
88. House Committee, *Army Reorganization*, 935.
89. Shiner, "Benjamin D. Foulois," 40.
90. House Committee, *Hearings*, vol. 2, 492.
91. Copp, *Few Great Captains*, 243.
92. Goldberg, *History of the United States Air Force*, 41.
93. Shaughnessy, "Flight Interview," 32.
94. AFSHRC, "Oral History Interview 766," 53.
95. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 229.
96. Copp, *Few Great Captains*, 162.
97. Shiner, "Benjamin D. Foulois," 32.
98. Sheehan, *Fiery Peace in a Cold War*, 20.
99. Copp, *Few Great Captains*, 163.
100. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 245.
101. Ibid., 257.
102. Shiner, *Foulois and the U.S. Army Air Corps*, 146. Six more fatalities would occur from Foulois's statement on 10 March until the last day of airmail operations on 1 June.
103. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 298.

Chapter 6

Conclusion

Thirty years after his retirement as chief of the Air Corps, an interviewer asked Benjamin Foulois to name the most important accomplishments of his military career. Without hesitation he answered with events from two very different periods of his 37 years in uniform: the development of the $640 million aviation program during World War I and the development of the B-17 bomber while chief of the Air Corps.[1] The first of these accomplishments provided the members of the fledgling Air Service with funding and expansion plans beyond their wildest dreams and firmly established airpower as an intrinsic element of the American way of war. As Col Edgar Gorrell, the official Air Service historian of World War I, summarized, "Our World War [I] aeronautical effort resulted in a little understood but yet an enviable record. We started with nothing—not even blueprints—not even experience. We succeeded in building a splendid Air Force, in placing American-built planes at the front, in creating and supplying one of the best, if not the best, of all aeronautical engines and in supplying vast quantities of severely needed materiel to our Allies."[2] Foulois's second great accomplishment, the development of the B-17 Flying Fortress, was the culmination of his efforts in the second half of his career to leave the Army's air arm in a position to meet the challenges of the next world war he knew was coming.

How did Benjamin Foulois's personal qualities and professional skill enable him to organize, train, equip, and lead the American Air Service during World War I? Looking at Foulois the man shows how his personal courage influenced his decisions as an aviator and a leader. Examining Foulois the political infighter provides insight into how his methods of advocating for airpower differed from those of his more outspoken peers, especially Billy Mitchell. Evaluating Foulois as a leader sheds light on how he was able to guide the Army's air arm from a single aircraft to an organization that remained in the Army but was functionally independent of it. Finally, Foulois's writings on airpower theory show how his thoughts on the uses of air-

power evolved over the course of his career from a focus on tactical support of the ground forces to the promise of independent strategic bombing.

The Man

Foulois repeatedly demonstrated great personal courage throughout his career. During his two tours as an infantryman in the Philippines, he repeatedly engaged in combat against the Moro insurgents, earning both promotions and citations for bravery as a result. He became one of America's first military test pilots when the Signal Corps gave him the Army's only heavier-than-air aeroplane and told him to teach himself to fly without the benefit of an instructor pilot. In World War I, Foulois again demonstrated great courage by personally leading the first flight of an American combat squadron of 18 American-built DH-4 aircraft behind German lines.[3] However, at times his courage and drive to succeed led him to push his pilots beyond the limits of their training to accomplish larger goals. Foulois might have prevented the aircraft and pilot losses of the 1914 Mackay Trophy competition and the first deployment of the 1916 Mexican Punitive Expedition had he scaled back his ambitions and matched his goals to his pilots' abilities.

Throughout his career Foulois repeated his personal motto "You learn more through failure than you do through success." While he failed many times during his career, he always found a way to turn his current failures into future successes. His many unsuccessful flights in San Antonio while learning to fly gave him the knowledge of aviation safety and airplane maintenance and repair he needed to fix the North Island Flying School's poor safety and training record. His failure as commander of the 1st Aero Squadron in Mexico to accomplish Pershing's reconnaissance taskings led to many design improvements to DH-4 aircraft arriving in France in the latter months of World War I. Foulois made an honest assessment of his failure to establish an effective training and supply infrastructure in France as chief of Air Service and made sure he did not make the same mistakes again when he tackled the logistics problem a second time. Finally, even as he was fighting for his own political survival, Foulois used the Air Corps's

failure to provide effective airmail service in 1934 to press for better equipment and organization. He won both in the form of the B-17 and the GHQ Air Force.

Foulois's great physical courage also translated to political and moral courage. In 1908 he bucked the prevailing opinion of the War Department by stating that the dirigible was a developmental dead end and that the aeroplane would be the future of Army aviation. In 1917 he bypassed the General Staff's objections to his wartime aviation expansion plan and testified directly to Congress to secure funding. In 1919 he again clashed with the General Staff when he forcefully pressed for the air arm's independence, earning many enemies within the War Department and the Navy, including Franklin Roosevelt. As chief of the Air Corps, he responded to congressional allegations of mismanagement and deception by demanding an open court-martial to refute the charges. These many clashes with the War Department and Congress resulted in many sanctions and retributions. Recounting them with pride to Gen Douglas MacArthur in 1935, he said, "I've been using unorthodox language against the War Department General Staff since 1908. I have been subjected to sixteen major investigations since that year, and I have received a moral wound stripe in the form of reprimands for every one of them. One more reprimand won't be much of a burden."[4] Of course, many of these wound stripes resulted from Foulois's inability to keep his more negative traits in check, such as his need to have the final say in any argument and his inability to conceal disdain toward anyone, regardless of rank or position, who disagreed with his obviously correct positions.

The Political Infighter

Congressional legislation and testimony were Foulois's preferred methods of overcoming bureaucratic opposition to accomplishing his goals, and he won more battles than he lost. Foulois constantly volunteered to testify before congressional committees and appeared before both the House and Senate dozens of times throughout his career. He also did not hesitate to exert direct influence on the legislative process; on several occasions during his career, he surreptitiously crafted and

submitted legislation to congressional members sympathetic to his cause. By confining his dissent with War Department policies to the halls of Congress, he was able to take advantage of the rules of the bureaucracy to criticize the War Department General Staff without fear of official retribution. Foulois's mistake at the end of his career was his failure to understand that the rules work both ways and that the General Staff could freely criticize him in the halls of Congress, eventually leading to Cong. William Roger's crusade to have Foulois fired as chief of the Air Corps.

This method of registering dissent with War Department policies was perhaps the greatest difference between Foulois and Billy Mitchell; after all, they were both after the same goal—an independent air arm coequal with the Army and Navy. Mitchell, with his important family connections and (apparent) wealth, chose to use the court of public opinion to press his views on the incompetence of the Army and Navy. The Army retaliated with a court of its own. Although Mitchell had the backing of the public during his court-martial in 1925, he had made many enemies in military circles. Even his highly placed Washington connections could not save him from conviction. Mitchell's status as a maverick haunted him for the rest of his life; when Congress formed the Baker Board to examine the Air Corps and make recommendations for improvement, several senators and congressmen asked Secretary of War George Dern to name Mitchell as a member. Dern refused to let him get anywhere near the panel, stating that the board's task was technical, not political, and that he wanted no Mitchell-like grandstanding or headline grabbing.[5] Foulois, on the other hand, used congressional testimony, legislation, boards, and appropriations battles to persuade Congress to impose change on the War Department, culminating in the creation of GHQ Air Force in 1935. The GHQ Air Force was the practical result of Foulois's decision to compromise between his ultimate goal of independence and the reality of full control by the General Staff. Ultimately, Foulois knew when to push for independence and when to accept compromise in lieu of defeat.

The Leader

While a good leader of small organizations such as the 1st Aero Squadron and the North Island Flying School, Foulois arguably failed in his leadership of the Air Service in France. During his rocky tour as chief of Air Service, both internal and external factors frustrated his ability to establish effective leadership of the air arm. The lack of skilled pilots drove his decision to man his staff with nonflyers; their lack of experience with aviation and military bureaucracy led to inefficiencies and confusion resulting in "a lot of good men running around in circles."[6] Compounding Foulois's problems were a lack of trained pilots and mechanics and the inability of the American aviation industry to produce quality aircraft in quantity. Perhaps Pershing pushed Foulois too hard and gave him too much responsibility too soon. Although Foulois was only 38 years old when he jumped three ranks to take command of the Air Service, he was the most experienced aviator the Signal Corps had to offer, and no other flyer was better equipped for the job.

Foulois's performance as chief of Air Service of the 1st Army was short-lived and not much better than his performance in his previous command. Constant spats with Mitchell consumed much of his time as commander; Foulois spent most of his remaining energy dealing with the results of his previous lack of progress in building an effective logistics infrastructure for the Air Service. During the war, he resigned from both of his commands—first, to lead at the front and, later, to return to finish his original work, only with fewer responsibilities. After the war and reversion to his prewar rank, Foulois spent the next 12 years working his way back to the command of the Army's air arm. He finally succeeded in 1931, only to spend the latter half of his run as chief of the Air Corps mired in controversy, which again culminated in his decision to resign his command.

Foulois also used his positions as chief of the Air Service and chief of the Air Corps to nurture and protect the next generation of airpower leaders in the Army. Many of the officers he mentored throughout his career were members of the North Island Flying School and the 1st Aero Squadron in Mexico. In a 1916 photograph of the 28 officers of the Flying School, 13

would go on to become general officers later in their careers.[7] Foulois took many other officers under his wing while chief of the Air Corps, and he provided protection from the General Staff for several officers who testified on Mitchell's behalf during his court-martial. Many of Foulois's disciples went on to hold critical positions in World War II and beyond.

Carl "Tooey" Spaatz flew with Foulois in the Mexican Punitive Expedition, and Foulois later entrusted the young major with command of the training center at Issoudun during the war. Foulois kept his career on track after Spaatz testified at Mitchell's trial, and he served as Foulois's chief of training and operations in the Office of the Chief of the Air Corps. Spaatz went on to command Eighth Air Force during World War II and after the war became the first chief of staff of the Air Force.[8] Henry "Hap" Arnold was another promising officer who testified at Mitchell's trial and was subsequently ejected from Washington for continuing Mitchell's crusade for independence. Foulois salvaged his career by giving him command of March Field in 1931, and Arnold subsequently served as one of three regional commanders during the Air Corps airmail operation.[9] Arnold eventually became the chief of Army Air Forces in World War II and was the only Airman to ever win a fifth star.[10] Frank Andrews, another Mitchell supporter, served as Foulois's executive officer for several years in the Office of the Chief of the Air Corps and was held in high regard by both his Air Corps colleagues and the General Staff.[11] Later, the General Staff selected Andrews as the first commander of GHQ Air Force, and he went on to a distinguished career in World War II, culminating in his selection as commanding general of the US Army in Europe in 1943. Many believe that were it not for his untimely death in an airplane accident, he might have become supreme allied commander instead of Dwight Eisenhower.

Frank Lahm, who flew with Foulois during those first days of Army aviation in 1908, worked for Foulois in various capacities throughout his career. Lahm eventually became a brigadier general and headed the Air Corps Training Center at Randolph Field until his retirement in November 1941.[12] John Curry, another of Foulois's 1st Aero Squadron pilots, became the first national commander of the Civil Air Patrol (which Foulois founded) and retired a major general after commanding the

Western Technical Training Command during World War II.[13] Hugh Knerr, another of Mitchell's followers, helped Foulois develop the requirements list that eventually led to contracts for the B-17 and B-19 bombers. General Knerr retired in 1949 as the first inspector general of the US Air Force.[14] One way to judge a great captain is by the caliber of those he mentors during his career. By this measure, Benny Foulois stands tall.

The Theorist

Early in his aviation career, Foulois focused on developing the Signal Corps's flying component as a support element for the ground Army, as shown by his 1907 Army Signal School thesis. He was also one of the first aviators to consider the gaining of control of the air over the battlefield as a goal for airpower and accurately predicted the use of airplanes for reconnaissance, artillery spotting, and limited bombardment in World War I and beyond. Foulois's later encounters with the theories of Hugh Trenchard, Giovanni Caproni, and Edgar Gorrell in World War I convinced him that the future of airpower lay in strategic bombing. Although Gorrell brought Foulois a preliminary plan for the strategic bombing of Germany as early as November 1917, Foulois knew that the technical development of larger, more powerful bombardment aircraft would be necessary before he could put theory into practice.

Even after the war and his reversion to the prewar rank of major, Foulois never gave up on his belief in strategic bombing and his pursuit of aircraft that could accomplish the task. This quest for a strategic bomber led to the second most important accomplishment of his career, the acquisition of the B-17. Undeterred by Navy and General Staff opposition to strategic bombing, Foulois simply worked within the bureaucracy and developed his long-range bombers under the guise of strategic reconnaissance for the coastal defense mission. Foulois also pioneered a different kind of strategic bombing—the airdrop of supplies. During the winter of 1932–33, he tasked Arnold's unit to air-drop food and supplies to 21,000 American Indians who had become isolated due to massive blizzards in the Southwest.[15] Arnold's aircraft delivered 30,000 pounds of food, and

Foulois's actions began a long tradition of using airpower for humanitarian purposes around the globe.[16]

Despite Foulois playing an integral role in the first three decades of American military aviation development, Airmen and historians alike have never considered him a first-tier airpower theorist among the likes of Mitchell, Douhet, and William C. Sherman (another of Foulois's pilots from the Mexican Punitive Expedition). Foulois's Signal School thesis is one of the first known writings on airpower theory and made him by default an instant expert on aviation in the eyes of the Signal Corps, which led to his selection for one of the Army's first aviation assignments. However, he never continued his writings on airpower theory and instead chose to focus his efforts on pursuing technological and logistical innovation in military aviation. Based on his vast aviation experience—from his time as the Army's only airplane pilot to his tenure as chief of the Air Corps—he knew that theories were of little use unless Airmen had the tools to employ them, so he focused his efforts on ensuring that the Army had both the best aircraft and the best pilots possible. For example, during the war, Foulois was unable to execute Gorrell's strategic bombing plan—despite his enthusiasm for the idea of using airpower as a strategic weapon—due to the lack of adequate bombardment aircraft, insufficiently trained aircrew, and General Staff resistance to the idea of independent bombing operations. Ultimately, Foulois chose to leave the writing about airpower theory to Mitchell, Douhet, and the next generation of aviators exemplified by Sherman. Instead, he focused his energies on developing the technology and the organizations that would enable the Air Corps to put those theories into practice during the next World War he was convinced was coming.

Implications

Many aspects of the US Air Force's organization and training can be traced directly to Foulois's actions as one of America's first aviators. Innovations such as radio communications, dedicated flight surgeons, flying squadrons organized by function rather than into companies, flight pay, replacement training units, first-assignment instructors, and even seat belts and

wheeled landing gear were all a result of Foulois's continuous efforts to improve the effectiveness and efficiency of airpower. His 27-year quest to develop American airpower ensured that the Army Air Forces had the aircraft, the Airmen, and the organizations necessary to fight the greatest war of the twentieth century. As a result, the Army Air Forces avoided repeating the many mistakes that the Air Service made in World War I. In three short decades America was able to field an air force several orders of magnitude larger than the best efforts of World War I.

On the eve of World War II, the air arm occupied a unique position in the Army; it was part of the US Army, yet it enjoyed a degree of separatism in thought and action not found among the other arms under control of the War Department. This quasi-independence had its roots in three trends of the interwar years: the efforts to establish an independent air force, the development of independent strategic bombing doctrine, and the search for a heavy bomber with which to apply the doctrine.[17] During his aviation career, Foulois was instrumental in the development of the first and third of these trends, and he quietly allowed the second to evolve while loudly espousing the official policy of coastal defense.

Today, the US Air Force faces a new set of challenges. The need to quickly recruit and train talented personnel to operate a rapidly expanding force of remotely piloted aircraft has forced the Air Force to pursue alternate training strategies such as bypassing basic flight training in favor of placing officers directly into replacement training units. The Air Force and other government agencies such as the Department of Homeland Security are encountering difficulty in recruiting talented cyber security experts and are discovering that no amount of funding can build an organization staffed with talented personnel overnight.

This paper has shown that these problems are not unique in American aviation history. The Air Force will need visionary officers to develop creative solutions, just as Foulois showed originality in (eventually) developing an effective logistics infrastructure for the Air Service and working within the system to advance new concepts of airpower employment. Although Foulois had very little respect for Mitchell as an officer, he continued to nurture the careers of the supporters of Mitchell's theories, including Arnold, Spaatz, and Andrews, so that a new generation

of visionary airpower advocates would be in place to command the Army's air arm in the next war. Foulois's actions were the prototype for subsequent Air Force generals developing like-minded advocates for technological and doctrinal innovations and have resonated through the decades with Gen Curtis LeMay and the nuclear bomber, Gen Bernard Schriever and the intercontinental ballistic missile, and Gen Charles Gabriel and Air-Land Battle.

The Foulois story also shows the value of patience when attempting to establish radically new institutions and organizations. Foulois's quest for an independent Air Force began immediately after his return from France in 1919, but he realized early on that institutional resistance from the War and Navy Departments would be insurmountable for some time. Instead of taking the Billy Mitchell route of accusing the Army and Navy of criminal negligence in their misuse of airpower and subsequently resigning after a court-martial conviction, Foulois chose to work patiently within the Army system. Thus, he succeeded in establishing a General Headquarters Air Force, a vital first step toward eventual independence. Unfortunately, in recent years the Air Force failed to heed Foulois's lessons about working patiently within the system to establish new capabilities and missions. The Air Force's unilateral decision in 2006 to establish a cyber command with the goal of adding the control of cyberspace to its mission set caused a backlash from the Army, Navy, and the Department of Defense, resulting in the latter forcing the Air Force to scale back its efforts and integrate more with the other services.[18] In 2007 the Air Force sought to become the executive agent for all medium- and high-altitude unmanned aerial vehicles, with the goals of eliminating duplication of efforts among the services and reducing research and development costs. The other services saw this as another power grab by the Air Force; the Department of Defense once again stepped in and denied the Air Force's request, instead creating an interservice task force to study the problem.[19]

Finally, the Air Force's tradition of technological innovation began with Foulois's first experiments with and modifications to Flyer Number One in 1910 and continues to this day. Much has been written on cyber warfare over the last decade, but just as Foulois found with theoretical writings on strategic

bombing, good ideas are useless without the equipment to implement them. The Air Force must take the lead in developing and fielding a new generation of information weapons to secure access to and employment of cyberspace in pursuit of national strategic objectives.

In his introduction to the book *The Paths of Heaven: The Evolution of Airpower Theory*, Col Phillip S. Meilinger wrote, "Library shelves are crammed with books about the aerodynamics of flight, technical eulogies to specific aircraft, and boys' adventure stories. Less copious are good books on airpower history or biography. . . . Much needs to be done to fill such gaps."[20] This paper answers the call for a biography of one of the unsung heroes of the Air Service in World War I, Maj Gen Benjamin Delahauf Foulois. Though not as famous as the combat hero Eddie Rickenbacker or the maverick theorist Billy Mitchell, Benny Foulois is unmatched in his contributions to the success of the American Air Service in France, and a study of his failures and successes during the war can be of great use in addressing the problems of today's Air Force.

Notes

1. AFSHRC, "Oral History Interview 766," 64.
2. Hinton, *Air Victory*, 36.
3. "18 Liberty Planes Soar over Enemy."
4. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 273.
5. Cooke, *Billy Mitchell*, 267.
6. Patrick, *United States in the Air*, 6.
7. Maurer, *U.S. Air Service in World War I*, vol. 2, 60.
8. Spaatz, biography.
9. Shaughnessy, "Flight Interview," 46.
10. Arnold, biography.
11. Copp, *A Few Great Captains*, 121.
12. Lahm, biography.
13. Curry, biography.
14. Knerr, biography.
15. Foulois with Glines, *From the Wright Brothers to the Astronauts*, 226.
16. Shiner, *Foulois and the U.S. Army Air Corps*, 112.
17. Craven and Cate, *Army Air Forces in World War II*, vol. 1, 17.
18. Donahue, "Fearless about Cyberspace."
19. Scully, "Pentagon Rejects Air Force Bid to Control UAV Programs."
20. Meilinger, *Paths of Heaven*, xii.

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A Giant in the Shadows

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