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Journal of the Air Force Historical Foundation

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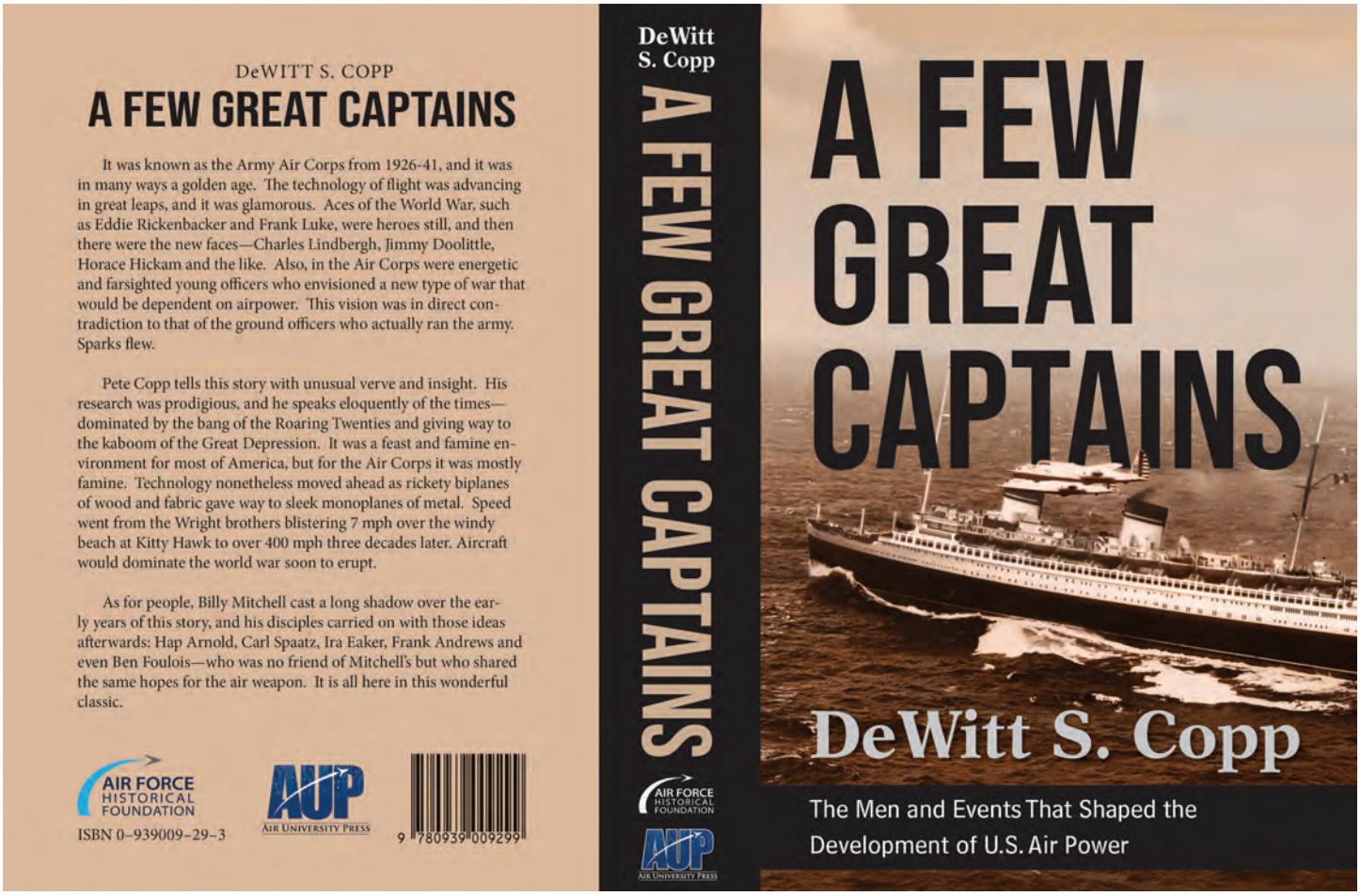

In a joint program with the Air University Press, AFHF is proud to offer the newly published update of Pete Copp's air power classic (now expanded), *A Few Great Captains: The Men and the Events that Shaped the Development of U.S. Air Power*. The free digital version will be available soon from the Air University bookstore.

A Few Great Captains is a terrific book, suitable for airmen of any rank. Pete Copp wrote a masterpiece that takes the Air Corps and its leaders, both senior and junior, through the tumultuous period of the 1920s and 30s. Ground-oriented Army leaders felt threatened by the new weapon of the airplane and therefore labored to control it and those who flew it. For their part, the airmen refused to be bridled by the ground zealots and instead foresaw a future where the airplane would dominate war. The visions of the airmen were not completely accurate, but they were far more so than those who saw the airplane as just another weapon to support ground operations.

This publication marks the Foundation's return to publishing and disseminating important, relevant, and readable history to all.

KNOW THE PAST...SHAPE THE FUTURE!

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Features

Book Reviews

List of reviews continues on page 3

Departments

FRONT COVER: An F–100F at Phu Cat. *(U.S. Air Force photo)*
BACK COVER: An F–100F drops a napalm canister in Vietnam. *(U.S. Air Force photo)*

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From the Editor

It's official. The new Editor of this journal is Paul "Abbie" Hoffman, last seen at Air University Press. He is phasing into the job throughout 2026. This is his first issue, in association with the undersigned. And please note our new email, editor@afhistory.org. We are phasing out our old airpowerhistory@yahoo.com which predates our afhistory.org domain.

Our opening article is by a new contributor, Donald M. Bishop, who is relating the interesting history of Samuel Taylor Moore, a World War I veteran who developed into a prolific author in the interwar period.

Our next article is contributed by our well-known repeat author Thomas Wildenberg, who has brought us an interview/memoir of fascinating airman Robert Breault. Breault was a fighter pilot in the 1960s, an early Wild Weasel pilot, who went on to a distinguished career as an optical scientist and entrepreneur. These are his recollections.

Our third article is from first-timer Edward J. Erickson, and focuses on the fighter plane production in New York state during World War II. In the article he contextualizes that aircraft production into the greater overall air effort in WWII.

Let me encourage any of our readers to contribute that article that has been rolling around their consciousness for several years. We can always use new scholarship.

Don't forget to head to page 6 and look over the details for this year's Annual Awards Banquet as well as the AFHF Symposium for this year. Details are also at afhistory.org/events/

The Leadership's Message can be found on page 4. It's worth the read. Don't miss Upcoming Events on page 62. And the issue closes with the Mystery on page 64. Enjoy!

Richard I. Wolf, Editor

From the Chairman, Spring 2026

To the Membership,

In my final leadership letter as Foundation Chair, I want to focus on one of our lesser known groups of heroes, the Air Force Special Projects community.

At the National Museum of the United States Air Force, where the story of American airpower is told through aircraft, artifacts, and the people who shaped them, a new chapter is being added. The Secretary of the Air Force Special Projects (SAF/SP) community is establishing a permanent memorial site to recognize a group whose influence on national security has been profound—yet largely invisible.

This effort is not about unveiling classified programs or revisiting operational details that must remain protected. Instead, it is about acknowledging service. For decades, men and women assigned to Special Projects worked at the leading edge of technology, strategy, and innovation, often under extraordinary pressure and almost always without public recognition. Their success was measured not in medals or headlines, but in deterrence preserved, advantage maintained, and crises that never took place.

Due to the often secret and technical nature of their work, the Air Force has had few opportunities to recognize those whose work necessarily remained behind closed doors. Yet many of the capabilities that define modern air and space power trace their origins to Special Projects—programs characterized by technical audacity, disciplined secrecy, and a relentless focus on mission outcomes.

What makes this memorial especially significant is its location. By placing it within the National Museum of the United States Air Force, the SAF/SP community is ensuring that its story becomes part of the Air Force's permanent institutional memory. Visitors—whether Airmen, Guardians, scholars, families, or members of the public—will encounter not just the hardware of airpower, but the human dimension of innovation carried out in silence.

The creation of the memorial has also sparked renewed interest in the broader history of Special Projects and the people who served within them. That history has been carefully captured in a book authored by members of the community and distributed internally, preserving personal accounts, organizational lessons, and reflections on leadership under conditions few ever experience. These narratives reveal a culture defined by trust, accountability, intellectual rigor, and an uncommon willingness to accept responsibility without recognition. The book will soon be posted on the AFHF Archive page at Air University Archives. Air Force Historical Foundation - Air University

Coverage of the memorial dedication itself is valuable, but the deeper story lies in what SAF/SP represents: how the Air Force has historically balanced secrecy with innovation; how leaders built teams capable of operating with minimal guidance and maximum consequence; and how institutional success often depends on people whose names never appear in official histories.

The SAF/SP Memorial is, at its core, an act of respect. It honors those who served faithfully in roles that demanded discretion, resilience, and moral clarity. It also sends a message to future generations of Airmen: that service matters, even when it cannot be publicly acknowledged; and that the Air Force values not only visible heroism, but also the quiet excellence that sustains national security over time.

Additional information on the memorial effort, its progress, and the history it seeks to preserve can be found at www.safspheritage.com . As the site nears completion, it deserves thoughtful attention—not simply as a physical space, but as a testament to a community whose legacy has shaped the Air Force in ways history is only now beginning to fully appreciate.

Serving as Chair of the Air Force Historical Foundation over the past two years has been a privilege that mattered deeply to me and a responsibility I accepted with profound respect for those whose stories we preserve. The Foundation exists not simply to preserve historical records, but to steward the story of American air and space power—its people, its institutions, and the principles they defended. During my time as Chair, I have been honored to serve alongside our Board, staff, and supporters to strengthen that stewardship.

Two milestones stand out. First, the adoption of new bylaws has modernized our governance, clarified roles and responsibilities, and aligned the Foundation with the best practices expected of a national institution. Second, the approval of a new strategic plan has given AFHF a clear sense of direction—grounded in our history, yet focused squarely on relevance, sustainability, and public engagement in the years ahead.

Together, these steps position the Foundation not just to preserve the past, but to lead thoughtfully into the future.

John L. Barry, Maj Gen, USAF (Ret)
Chairman, Air Force Historical Foundation (2024–2026)

2026 Annual Symposium and Awards Banquet

MAY 13, 2026--Save the Date and plan to attend the AFHF Annual Symposium. For this year, the event will take place in the new Air and Space Forces Association Headquarters conference center in Crystal City, VA from 0800-1700. The theme for the event is: Unmanned Air and Space Flight—1915-2025. Panels of experts will share their experiences and stories throughout the day. Both history and operational panels are planned along with a working lunch to highlight our book prize winners. For registration details, click on the link below.

https://afhistory.org/events/

AFHF Annual Awards Banquet

Steven F. Udvar-Hazy Center Space Hangar, Chantilly, VA, 22 May 2025
6:15 PM to 10:00 PM
REGISTRATION FEE
AFHF MEMBER: $200
NON-MEMBERS: $250
Includes: Parking, Seated Dinner, Social Hour, USAF Band Ensemble, Special Guest Speaker, two beer/wine tickets, and more
Dress: Formal/Mess Dress (optional)

For event sponsorship or to purchase tables of 10 contact, xd@afhistory.org
Awardees can be found at this link: https://afhistory.org/awards/
Individuals attending both events will receive a discounted total registration fee.
To sign up for either or both events head to https://afhistory.org/events/

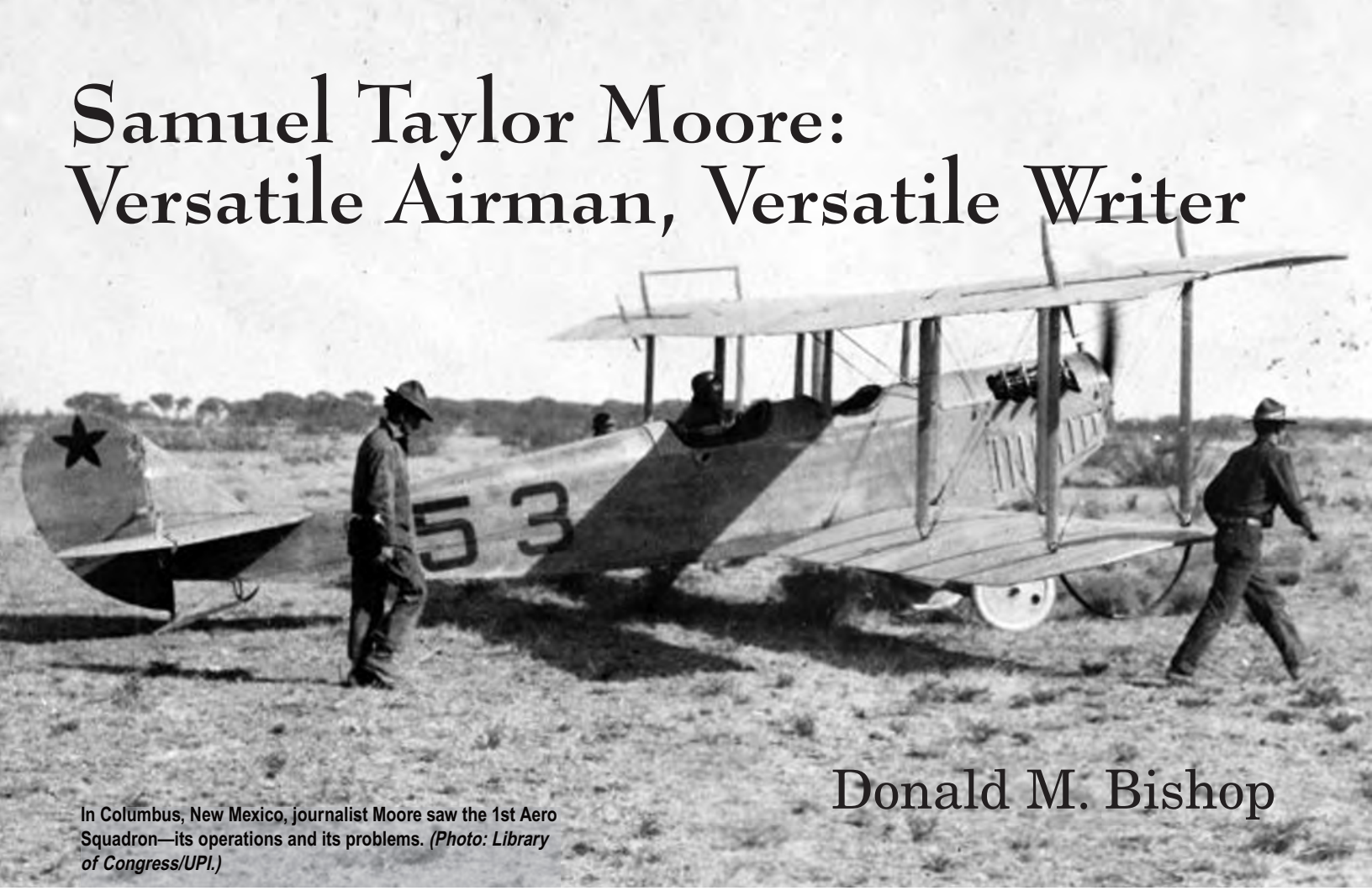
Don't miss our Podcast

We have a podcast that you don't want to miss. Coming in November, join Matt Jolley for a wonderful episode of Know the Past…Shape the Future. IT IS TERRIFIC!

Our latest episode goes behind the scenes of the new Netflix documentary Air Force Elite: Thunderbirds with director Matt Wilcox and former Thunderbird Commander Colonel Justin Elliott. The film reveals the human side of the Thunderbirds—the pursuit of excellence, the progression, and the very real hardships behind the precision you see in the sky. The team's message is resonating everywhere, from two sisters in Colorado to professional sports organizations. The Thunderbirds' story is making an impact far beyond the flight line. Listen now and hear how it all came together. Enjoy the podcast and then have a family night to watch the movie.

www.afhistory.org/podcast/

Samuel Taylor Moore: Versatile Airman, Versatile Writer



In Columbus, New Mexico, journalist Moore saw the 1st Aero Squadron—its operations and its problems. *(Photo: Library of Congress/UPI.)*

Donald M. Bishop

The progress of aviation and air power in the first half of the 20th century depended not only on aviators and those who manufactured ever more capable aircraft. It relied too on public opinion and publicity. Newspaper features, magazines, books, newsreels, screenplays, radio scripts, and films increased public support. Early air leaders like Billy Mitchell, Hap Arnold, and Ira Eaker all wrote books; Alexander P. deSeversky's book, *Victory Through Air Power*, was a book club selection and became a film. These were the most prominent names, but scores of other writers turned out stories, articles, screenplays, and books that undergirded advocacy for air power.

Among the most active of those writers was Samuel Taylor Moore (1893-1974). He stands out as both a "fighter" and a "writer." This article provides a preliminary biography—and, in the footnotes, a bibliography—of this neglected airman and air power advocate.

He spent World War I in the Air Service, commanding an AEF balloon company in France. Between the wars he wrote magazine articles on social issues, aviation, a respected book on the origins of the First World War, and pulp fiction. Having kept active his Reserve commission, he was recalled into the Army Air Forces during World War II and sent to the China-Burma-India theatre. In 1948 he was yet again recalled to active duty, served briefly in Korea, and was the first commander of the Air Force's Air-Ground Operations School.[1] After finally retiring, he again turned to writing, authoring articles and a popular history of air power.

With Pershing in Mexico

Born on June 24, 1893, in Westfield, Massachusetts, Moore finished only a year and a half of high school. His start as a journalist was at the *Springfield Union* in 1912; he was recalled as an "apple cheeked, husky young specimen." At 6 feet, 1½ inches, he was tall. Some years later a friend recalled, "Newspapermen of those times included a larger percentage of convivial souls who were broke much of the time in their pursuit of wassail or romance. The pay was small, to say the least, and a person stayed with the game more because he loved it than for any hope of other reward."[2] Moore's beat included coverage of the annual drills of the Massachusetts Second Infantry Regiment at Camp Whitney in Framingham.[3]

In the summer of 1916, much of the regular U.S. Army was in Mexico pursuing Pancho Villa. As General Pershing's troops moved farther south the need for additional soldiers to protect his supply lines thinned Army units along the border. In May, President Wilson activated National Guard units from Texas, New Mexico and Arizona. On June 18, 1916, the President called up more National Guard units. Moore became the "Springfield Union Staff Correspondent

Captain Samuel Moore in 1919. *Photo from The Balloon Section of the American Expeditionary Forces, S. W. Ovitt and L. G. Bowers, Eds., (New Haven: Tuttle, Morehouse & Taylor Co., 1919).*

with the Second Regiment" of the Massachusetts National Guard.

The last large engagement during the punitive expedition, however, was at Carrizal, Mexico, on June 21. The Massachusetts Guardsmen arrived in El Paso on July 1, thus serving during what one historian, James W. Hurst, described as "the doldrums," "idleness, frustration, and withdrawal."[4] Moore filed mostly hometown stories, but his 47 dispatches reported training, constructing and defending a camp, patrolling, health, courts-martial, and discipline.[5]

Commissioned through AFROTC in 1968, Mr. Bishop's line assignments included Vietnam and Korea, and he taught history at the USAF Academy, including the first classes that included women. He then joined the U.S. Foreign Service. During 31 years as a public diplomacy officer, he served in seven countries and attained the rank of Minister-Counselor in the Senior Foreign Service. He was the Country Public Affairs Officer in Bangladesh, Nigeria, and China. In 2008, the State Department sent him to the Pentagon as Foreign Policy Advisor (POLAD) to the USAF Chief of Staff. His final Foreign Service assignment was Kabul. After retiring he was the Donald Bren Chair of Strategic Communication at the Brute Krulak Center for Innovation and Future Warfare at Marine Corps University in Quantico. His degrees in history are from Trinity College and Ohio State University. His articles and essays have appeared in Air Power History *(Fall 2021),* Air Force Magazine*,* Marine Corps Gazette*,* Journal of Advanced Military Studies*,* American Diplomacy*, and other professional journals.*

Moore covered the summer training of the Massachusetts National Guard for the *Springfield Union*, and the newspaper sent him to accompany the Second Regiment when it was deployed to New Mexico to join the Mexican Punitive Expedition.

The regiment's headquarters was in Columbus, New Mexico, also the base of the 1st Aero Squadron flying the underpowered JN–3 "Jenny," commanded by Captain Benjamin Foulois.[6] Moore would have known him, at least in passing.

The Massachusetts Guardsmen returned home in October 1916. Observing and reporting on a regiment of citizen soldiers called to active service not only gave him a preview of military leadership – lessons he could apply later. He also saw on a small scale challenges the nation would face when it called and trained millions in 1917.[7]

That Moore, after returning from New Mexico, then became White House reporter for the United Press gives testimony to his standing as a journalist, but it would only be for a few months.[8]

Commanding a Balloon Company in France

The United States entered the war on April 7, 1917. A slight astigmatism disqualified Moore to become a fixed-wing pilot. He enlisted in the Army at Fort Omaha, Nebraska, which had been re-established as a training center for its observation balloon units.

As soldiers were assigned and the first balloon squadrons were formed, "the flight officers learned . . . mapping, aerial photography, parachuting, communication techniques, and balloon care. Noncommissioned soldiers learned hydrogen balloon inflation, techniques of controlling the balloon, care of communications systems, and balloon care. Cordage, knots, gas making and care of the cable and winches holding the balloon were all taught."[9]

Moore was commissioned as a first lieutenant on October 8, 1917; named to command the Seventh Balloon Company in November; trained at Fort Omaha; and sailed with the unit to England in January 1918 and to France the next month. Four months were spent in theater training in France, and Moore passed the balloon observer's course at the Saumur School of Artillery Instruction in April.[10]

The Seventh Balloon Company reached the front on July 4, 1918, initially working with the 32nd Corps of the Eighth French Army. Except for two days, it would remain in action until the armistice. Assigned to the U.S. V Corps during the St. Mihiel offensive, it supported the advances of the American 1st and 2nd Divisions. In the Meuse-Argonne, moving more than 80 kilometers, it provided observation and artillery adjustment (*reglage*) for the U.S. 37th, 32nd, and 89th Divisions.[11]

Oklahoma State University historian Thomas Wikle has summarized balloon operations in the air: "Each balloon was guarded by lookouts, antiaircraft guns, and machine gun crews along with a pursuit airplane that flew a circuit around several balloons. However, the work of an aerial observer remained dangerous since a stationary balloon presented an inviting target. When threatened by an enemy plane, a ground crew quickly would reel in its balloon and, when a balloon was seriously damaged or set on fire, the observers could escape using parachutes hanging on the outside of the basket."[12]

In the Seventh Balloon Company, four balloons were burned by enemy aircraft and two were "deflated by shell fire." An officer was gassed, five soldiers were wounded, and influenza and dysentery thinned its working strength.

On October 2, the unit's history recorded, "Lieutenant Moore, when alone in the basket, was attacked by eight enemy planes, two of which fired on the balloon, two on the winch crew, and a fifth on the observer's parachute; the remaining three hovered over the balloon. Lieutenant Moore landed safely, and the balloon was not burned, although the balloon, parachute, and basket were riddled with holes."[13] For his courage, Moore would wear the Citation Star on his Victory Medal. In 1932 the award was converted to the new Silver Star.

The variety of challenges faced by Moore as the company's commander – training the company's "vigies" (aircraft spotters) and antiaircraft gunners, movement of the company, its balloons, and highly flammable hydrogen cylinders over blasted roads, supplying and feeding the unit on the move, raising and lowering the Goodyear R–4 balloons, establishing telephone nets to reach artillery units and command posts, bombardment by German artillery and aircraft, gas attacks, and field repair of downed but not burned balloons, among them – showed his versatility.[14]

The First Sergeant of the company was Pablo M. Herrera, "a former captain of the Carlisle Cadet Corps."[15] The company's history said that the member of the Pueblo nation "ably executed his duties, with fairness and justice." In November 1918 he left the company for officer training, which he "passed with a very high grade." The armistice was signed while he was still an officer candidate, so members of his class were not commissioned.[16] Perhaps the respect earned by a Native American in Moore's company helped blunt the ambient social prejudices against nonwhites in that era.

Moore was promoted to Captain on November 5, 1918, but he spent the last few days of the war hospitalized for illness. Returning to duty, he faced the challenge of leading troops who wanted to return home, lived through harsh winter weather in muddy camps, tired of more "training" and "sports" to keep them busy, and grew restless and disorderly while waiting for limited shipping to become available. Unlike other officers, Moore had seen this before – in New Mexico while he covered the Massachusetts National Guard.[17]

A few years later, Moore wrote an engaging article, "Portraits From My Military Albums," about his doughboys in training and in France. "The soldiers in my command were good, bad, and indifferent, but not one of them was the fictional type who goes about seeking to contribute his life that some great ideal may prevail. They groused about the food, had their own opinions (often uncomplimentary) of every officer and brother-in-arms, took mud and drudgery as a personal injustice visited upon them by God, lied engagingly about their heroic exploits in letters home while we were in training miles from the front, and distorted true conditions in letters of cheer while unhappy and miserable in the gray slime of the Argonne."[18] He recalled various shenanigans among officers awaiting flying training in St. Maxient, France.[19]

Moore was not immediately separated after he returned to the United States. He kept his flying pay by riding in heavier-than-air aircraft, widening his acquaintances in the Army's air arm.[20] For a time he was "organizing from among postwar recruits an observation-balloon company for service in the Philippines."

Landing the R–34

In July, 1919, as the only balloon-qualified officer at Roosevelt Field, New York, he was tasked to organize and train a landing crew of 600 soldiers to receive the British rigid airship R–34 making its first westward crossing of the Atlantic Ocean.

When the day came, however, Moore found that his 600 soldiers had been sent to Montauk Point on the island's easternmost tip, almost a hundred miles away, because the airship had signaled that its fuel was low. (The message had been received by the Navy, which turned out Moore's troops without informing him.) When the R–34 flew on to

British rigid airship R34 at Mineola, LI, NY, 7/6/1919, after its crossing of the Atlantic. Moore organized the landing party.

The Army balloon from Scott Field lifts off from Akron in the National Elimination Balloon Race, 1927. ***(Screenshot from www.youtube.com/watch/?v=WWbMF0z1PRo)***

Roosevelt Field, Moore had to improvise. He rounded up more soldiers and some civilians and gave them a few hours of instruction.

There was no hangar or mooring mast at the airfield, so the landing and mooring of the huge airship was a challenge. Writing for *The New Yorker* magazine in 1957, Moore recalled how it was necessary to assure the airship's nose always faced the wind, and the ground crew was stressed for three days because the gas in the envelope expanded and contracted with the temperature each day and night. The "days were hell."[21]

Workaday Journalist and Writer

While in New York, Moore married Grace Stearns ("a prominent member of the motor corps in this city and an active Red Cross worker").[22] They would soon have two children.[23]

After his discharge he began a versatile career as a journalist and writer. At different times he worked for the Associated Press, Fox News Reels, International Newsreel, *New York Daily News*, and the *Boston Post*.[24] Otherwise he was "freelance," writing on commission in many prestige journals and magazines.[25] There seems to be no comprehensive list of his publications, but he wrote on a wide variety of topics.

For the respected opinion magazine *The Independent* —which once called him its "investigator"—he wrote on the smuggling of immigrants,[26] the effects of tabloid journalism,[27] the Coast Guard's efforts to combat "rum running,"[28] booze smuggling from Canada,[29] Republican political corruption in Georgia,[30] four "Busy Towns,"[31] and four investigative reports on the Ku Klux Klan in Indiana.[32] He reported on the "fight" over veteran bonuses[33] and veterans' demands for loans.[34] In *the Saturday Review of Literature* he criticized the "avaricious demands upon Congress for lavish gratuities" for veterans,[35] and the *American Legion Monthly* ran his fascinating article on the employment of veterans as Hollywood extras.[36] In *The Atlantic Monthly* he thoroughly reviewed the need for "preparedness," wartime industrial mobilization, and legislation.[37] He reviewed the early development of submarines;[38] profiled a key Pennsylvania Railroad executive;[39] and lauded the election of Fiorello LaGuardia as Mayor of New York."[40]

Writing in *New Outlook,* a 1931 article described international efforts to curb the smuggling of Turkish heroin to many markets, including the U.S.[41] In 1933 he traced the coming effects of the end of Prohibition and expected new taxes on liquor. He added a personal note. "I am one of many hundreds of thousands, perhaps I should say millions, who feel we have disregarded, rather than disobeyed, the Prohibition law." "We would much prefer paying Federal and state governments in fair taxation the profits we now are paying to bootleggers."[42]

He co-wrote two books still frequently cited by historians of Wall Street and finance. In 1930 he and Arthur Pound edited *They Told Barron: Conversations and Revelations of an American Pepys in Wall Street—The Notes of the Late Clarence W. Barron.* When he died in 1928, Barron was president of Dow Jones and "the de facto manager of *The Wall Street Journal*." In his "Titans of Fortune" series, Daniel Alef judged him "the founder of modern financial journalism." The book was also serialized in the *Saturday Evening Post*.

In 1935 Boyden Sparkes and Moore published *The Witch of Wall Street: Hetty Green*. Henrietta Howland Robinson Green (1835-1916) was known as the richest woman in America, the nation's "First Value Investor and Financial Grandmaster."[43]

Aviation and Air Power, Civilian and Military

In the 1920s and 1930s, Moore continued as an officer in the Army Air Corps Reserve. He was one of eight officers flying four Army balloons in the 1927 National Elimination Balloon Race,[44] and he again participated in 1930.[45]

Given his service background, Reserve commission, and connections, Moore increasingly wrote with authority on aviation — the "chaotic" state of U.S. aircraft manufacturing,[46] how the development of aircraft manufacturing and airlines needed Congress to enact a favorable system of federal regulations,[47] "air power as the pivot of effective disarmament,"[48] and the prospects of civil aviation[49] and the airlines.[50] He frequently wrote informative articles for *Air Trails* and *American Legion Monthly* magazines.[51]

A robust advocate of American air power, he observed the sinking of two obsolete US Navy battleships—the USS

A bomb strikes the USS New Jersey (BB-16) during an attack by Air Corps bombers led by Billy Mitchell on September 5, 1923. It soon sank. Moore watched from the USS St. Mihiel. *(US Navy.)*

Samual Moore (right) and his pilot Lt. J.K. McDuffie, an Army Air Mail pilot. *(https://archive.legion.org/node/1112)*

Virginia (BB-13) and USS *New Jersey* (BB-16)—off Cape Hatteras by Air Corps bombers on September 5, 1923.[52] He wrote of risks and fatalities in military aviation,[53] the frictions and interservice rivalry that prevented formation of an independent Air Force in the U.S.,[54] the court-martial of Billy Mitchell,[55] whether land or air combat would determine the outcome of the next war,[56] how investment in the air arms of the Army and Navy were "a bargain in preparedness,"[57] and the Coast Guard's need of an air arm for ocean rescues.[58] He wrote up interviews with Alexander P. de Seversky.[59]

Two sets of Moore's articles – on the Army's mission to fly the Air Mail and the Navy airship *Akron* – can stand in for the body of his writing.

Flying the Air Mail: It was Army flyers and aircraft that flew the air mail in 1918 until the Post Office assumed the mission, hiring its own pilots. Regular day and night transcontinental air mail delivery between New York and San Francisco began in 1924, and the Army initially provided some of the pilots. In 1924, Moore flew from New York to San Francisco and return as a backseat passenger in single-engine biplanes that carried the mail. His "box score" of the roundtrip chronicled achievements and difficulties: "DeHavilland airplanes, three. Mitchel Field [New York] plane, out to haystack in Sarpy County, Nebraska; Fort Riley [Kansas] plane, out to a bonfire at the Presidio of San Francisco (destroyed by order, not accident); Crissy Field [California] airplane, not out, safe at Mitchel Field. Forced landings, three. Distance traveled, 6000 miles. Flying time, 61 hours 43 minutes. Elapsed time, 20 days."

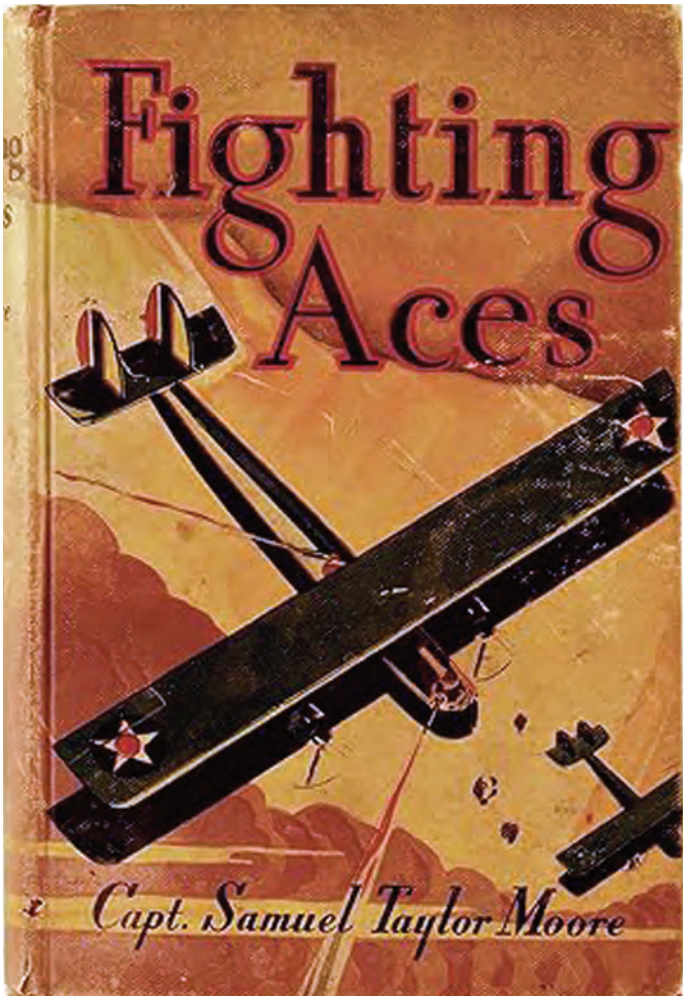
Moore's two colorful articles are long on describing fears and emotions, but they conveyed to readers both the hazards of transcontinental air mail flying and the accomplishments of the pilots and ground crews at Army and Air Mail landing fields.[60]

Navy airships: Moore was a journalist – sponsored by the *American Legion Magazine* — on the maiden flight of the Navy airship USS *Akron* (ZRS-4) from Lakehurst, New Jersey, on September 2, 1931. His January 1932 article described the construction, layout, and compartments of the airship in accessible layman's language. On the full-day voyage, the *Akron* few over the Delaware coast, the eastern shore of Maryland, Annapolis, Washington, DC, Baltimore, Philadelphia, Trenton, Perth Amboy, Staten Island, Manhattan, Coney Island, the Atlantic, and Lakehurst. Moore praised Admiral William A. Moffett as "the man responsible for this marvelous ship of the skies." The Admiral informed the journalists on the flight of the safety of helium gas, the construction of the airship by Goodyear-Zeppelin, how the Navy intended to employ it as a "scout-cruiser," and Moffett's conviction that "we have laid the foundations firmly for the development of commercial airships."[61]

Admiral Moffett died in the subsequent crash of the *Akron* in a storm off New Jersey on April 4, 1933. In the *American Legion Monthly* three months later, Moore wrote that the crash "gave lie to two widely publicized safety features" – the use of helium and that airship travel over the oceans was "safer than over land." Although the *Akron* was equipped with flexible propeller shafts that could "give her vertical pull in the manner of a helicopter," the disaster unfolded so suddenly there was no time to shift the propellers. Moore judged the tragedy was "a death knell to hopes of lighter-than-air advocates who had been dreaming dreams of a vast fleet of American commercial airships spanning the broad seas in the near future." His article also usefully reviewed Zeppelin operations in World War I – fictions and facts — and the role of U.S. Navy airships in recent fleet maneuvers. Moore's is still a valuable summary.[62]

Similarly useful is Moore's even-handed review of the controversies surrounding the crash of the Navy airship USS *Shenandoah* (ZR-1) on September 2, 1925, in Ohio.[63]

Moore had an affection for lighter-than-air (LTA) aviation, but by the end of the 1930s he chronicled a "Farewell to Balloon Racing,"[64] While he saw great value in the helium airship as the eyes of the fleet and providing transoceanic transport at twice the speed of surface vessels, he admitted that "the hydrogen airship is doomed." He made "The Case for Airships" in two 1937 issues of *Air Trails* magazine.[65]



The Pulps

Moore, then, had firmly established himself as an influential public affairs writer and aviation journalist in the two decades between the wars. Yet he also became a prolific writer of pulp fiction.

His initial foray was a collaboration with pulp writer Nels Leroy Jorgensen. For *The Balloon Boys*, published in 1924, Moore provided knowledge of ballooning, and Jorgenson furnished the pulp prose.[66] The *Saturday Review of Literature* said the book "relies for its appeal on originality of content rather than on style. Captain Moore . . . introduces some boys who are eager to take up balloon racing, and who unexpectedly find their ambition gratified, and they not only explore the skies, but meet with some startling perils – forest fires, a gale that blows them out to sea, and other difficulties."[67]

In the book, five teenage pals learn about ballooning from one "Captain Noyes" (who resembles Moore) who shares what he had learned at Fort Omaha. From the book, young readers learned some basic principles of ballooning and piloting – control of altitude using ballast, winds at different altitudes, the effects of temperature on gas volume and thus altitude, and how different landforms affected winds and air temperature. Readers also learned how balloon racing was organized.

Moore said he wrote ten thousand words of fiction each week.[68] The Fiction Magazine Index lists 57 short stories and four novellas by Moore.[69] Among the story titles were "Cloud Stormer," "Flying Bronco Buster," "Talons of Hate," "War Skies over Luzon," and "Wildcat Scrapes the Sky." They were published in *Air Trails, War Stories, Eagles of the Air, Skywriters, Flying Aces, Sky Birds, War Aces, Adventure, Air Stories*, and other magazines. Published on low grade "pulp" paper with a four-color cover illustrating a sensational scene, the magazines were popular, cheap, and accessible. Alas, nearly a century after their publication, not all issues are available on the web.

A Springfield, Massachusetts publisher bundled several of Moore's stories into inexpensive juvenile hardbound books. In 1932, McLoughlin Brothers Incorporated published three titles—*Aces All, Fighting Aces,* and *Under Sea Heroes.*

Fighting Aces is curiously misnamed, for none of the stories feature fighter combat. Rather, Moore explained, "The high standards of valor of the pursuit pilots were upheld by those other members of the air clan who were fighting in the less publicized branches of air warfare, where the individual was submerged in a formation flight flying one-for-all and all-for-one. Indeed, the greatest toll was in bombardment and observation work. I would have those unsung air heroes share in the acclaim of their more glamorous brothers of pursuit."[70] And the first story, "Wild Sausage," was set in an observation balloon unit.

Rethinking the First World War

Moore was a proud veteran of the Air Service in the First World War, but in the 1930s he began to express doubts. They came together with the publication of *America and the World War: A Narrative of the Part Played by the United States from the Outbreak to Peace*, published by Greenberg in 1937. Moore chronicled the slow buildup of American willingness to join the Allies against Germany, the mobilization and operations of the American Expeditionary Forces, and the subsequent European denial that America's participation had been decisive.

Historian J. E. Smyth provided this precis: "Rather than assuming that the nation shared Wilson's and the jingoist press's perspective, Moore's research indicated that even as war was declared, the public regarded the conflict as 'unreal, a distant nightmarish dream, incomprehensible to lay America.' America had been pushed to war by violations of neutrality from both Germany and Britain, but Moore also called into question America's vaunted impartiality, citing the economic measures that consistently favored Britain." Smyth continued: "The American war experience began in ambiguity and confusion and, for many, progressed to disillusionment and apathy."[71]

Giving Moore's book only one star, the *American Mercury* dismissed it as "Another of the many attempts to analyze the Republic's martial efforts within the limitation of 300 pages. Mr. Moore adds little to a discussion already twenty years old."[72] This is too curt and dismissive. Whatever the state of discussion in the 1930s, this is a good book

Shown above, left to right, are Captain M. H. Cannon and Major Samuel T. Moore, officers in the Army Air Corps, after arrival at Camp Davis for duty with the Barrage Balloon training center. They were the first Air corps officers to be assigned there, and were specialists in the use of lighter-than-air craft. ***(Photo: Wilmington (N.C.) Morning Star, June 18, 1941.)***

for 21st century historians looking back on the Great War. Moore wrote of many incidents now scarcely remembered; his veteran's criticisms of American military leadership were firsthand; his assessments of the postwar settlement were prescient.

In the late 1930s, Moore wrote the screenplay for two anti-war films—*The Dead March* (1937) and *Invasion* (1941). Both were directed by Bud Pollard and voiced by Boake Carter. The Internet Movie Database has only brief notes about both films, and neither is publicly available.[73] The description of *The Dead March* by the *Motion Picture Herald* in 1937 described it as "A series of war scenes carefully collected from the archives of the newsreels, together with some special camera work, [to] illustrate the brutality and the horror of modern carnage." The film concluded with "ghostly figures of the unknown soldiers of Germany, France, Italy, Great Britain and the United States [who] rise up from their shrouds to declaim the jingoistic and parochial propaganda of their respective countries."[74] *Time* magazine noted its "gruesome shots" and said it was "not even intended to be entertaining."[75]

As the Second World War approached, Moore wrote articles on World War I submarine warfare that were circulated by the Newspaper Enterprise Association, a syndication arm of the Scripps Company.[76] He also presented the diary of a Mormon woman pioneer[77] and related how Congress restored the reputation of a disgraced World War I Army officer.[78] In 1940 he reviewed ten years of news for the readers of the *American Legion Monthly*.[79]

Moore in World War II

The Second World War began in Europe in 1939, and the U.S. armed forces began a period of rapid expansion. Moore was a combat veteran with an active reserve commission as a captain in the Army Air Corps. He was called to active duty on June 10, 1941, and promoted to major, but in an Air Corps focused on operations by winged bombers and fighters, his balloon expertise was out of date.

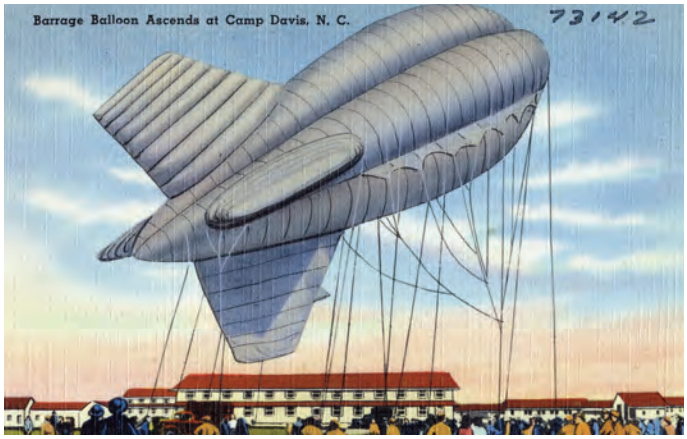
Army planners valued one lighter-than-air mission, however – barrage balloons to protect high value targets and invasion landing sites. In World War I, observation balloons belonged to the Air Service; in World War II, barrage balloons were transferred to the Coastal Artillery Corps. The Army, for once, put a round peg in a round hole. Moore was initially assigned as the Army Air Forces representative to the Barrage Balloon Board. His first hand experience with hydrogen was of value. Soon he was in North Carolina organizing the Army's new barrage balloon school at Camp Davis in Wilmington.[80] He returned to Washington for a short stint on the War Department General Staff as chief of the Air Branch's Far East Section.[81]

Most Air Corps officers were eager to take the war to Europe and Japan, but who needed a balloon retread? Moore was instead sent to India as a lieutenant colonel in the General Staff Corps.

A strategic goal of the Allies was to provide supplies to keep China in the war, and air planners in Washington initially hoped that missions to bomb Japan might launch from China. The vast distances to supply what would become the China-Burma-India (CBI) theatre, however, slowed any buildup. Aircraft and supplies intended for the CBI could be sent elsewhere; the Japanese controlled Burma; supplying China by air "over the hump" faced intimidating storms and enemy aircraft; the climate at poorly supplied bases in Assam in India's northeast eroded morale and efficiency. Commands, commanders, and theater organizational charts changed with shifts in Allied priorities.

In this organizational turbulence, every new general officer had staff needs. Enter Moore, reaching India on June 18, 1942. Historian Edward M. Young judged that month to be "the Tenth Air Force's nadir."[82] Moore's Silver Star commanded respect. He was versatile. Every commander needs "fighters" and "writers," and Moore could write! That he was an "old time publicity man, bon vivant and after dinner speaker extraordinary," must have been good for morale.[83] He played poker.[84]

The burning of individual service records in St. Louis in 1972 deprives us of a proper record of his assignments,



but different references indicate he served in the Assam Air Defense Command (Acting A-2), the India-China Ferrying Service, the South East Asia Command's Troop Carrier Command (executive officer), and the Tenth Air Force (Public Relations Officer[85] and Historian).[86] In one way or another, every staff in the theatre supported the U.S. buildup of ferry and air transport routes across India, development of airfields and navigation aids, defending against Japanese air raids and naval incursions into the Indian Ocean, flying over the Himalayas to China, bombing targets in Burma and Thailand, insertion of units behind Japanese lines, pioneering air commando operations, and provisioning by air the allied invasion of Burma paralleled by construction of the Stilwell Road.[87]

Moore joined combat missions eleven times. One was a record 2400-mile mission in 1942 from Pandaveswar, India, presumably in a 7th Bomb Group B–24 to bomb Rangoon.[88] In Operation Thursday on March 6, 1944, inserting General Orde Wingate's Chindits by gliders and transports to landing strips behind Japanese lines in Burma, Moore flew into Chowringhee.[89] Soon afterwards, he rotated back to the U.S., attended the Army Air Forces School of Applied Tactics in Orlando, and became assistant chief of staff for the I Troop Carrier Command.

After V-E Day, he was sent to Europe to head a study project on operations of the Luftwaffe. Back in Washington at the end of November, 1945, he led the evaluation of AAF Troop Carrier operations in all war theaters. Moore authored the comprehensive 2-volume report, *Tactical Employment in the U.S. Army of Transport Aircraft and Gliders in World War II.* It is still cited.[90]

When he separated as an Air Corps colonel in October 1946, he held five Military Occupational Specialties – Technical and Tactical Board Member, Military Intelligence Officer, Intelligence Staff Officer, Public Relations Officer, and Historical Editor. He wore the Legion of Merit.

He was recalled in 1948 for fifteen months. October and November 1948 found him at Eglin AFB, Florida, for Operation COMBINE III, a major air-ground exercise intended to "familiarize junior and senior officers of the Armed Forces with the capabilities and limitations of air power, and to portray the achievements made possible by close and adequate air-ground cooperation." The *Field Artillery Journal* explained that "The first (the theoretical side of the mission) was accomplished by means of skits, demonstrations, and static displays." Six "dramatized" skits were role plays of command-level meetings as a joint campaign was planned and unfolded.[91] Moore was the operation's skit director.

On October 15, 1950, a few months after the outbreak of war in Korea, he was again activated, this time for three years. He was sent to Pope AFB, North Carolina, to organize and command the USAF Air-Ground Operations School under the Tactical Air Command.[92] So great was the demand for this training that it outgrew the base and moved to Southern Pines, North Carolina, housed in the Highland Pines Inn, turning out thousands of graduates each year. He made an "observation tour" of Korea during the war.

Retirement

When he retired from the Air Force in 1953, a local newspaper reported he was "distinguished by white locks, beetling black eyebrows, and an expression of awful solemnity or else a puckish grin." It noted his "flavorful personality, as when in contemplative or party mood he recites poetry by the mile, with Kipling a favorite."[93] His was a mandatory retirement at age 60. In a thirty-year military career, he had served only eleven years on active duty; the additional years were in the Reserve.

In the summer of 1956, Moore appeared in television coverage of the Republican National Convention. There was no suspense about the results of the gathering, the re-nomination of Dwight Eisenhower and Richard Nixon. Reckoning there would be "dull moments," the network drew on the "Pogo for President" campaign by cartoonist Walt Kelly. "NBC cameras will switch from the convention floor to a smoke-filled room, where Kelly and his colleagues will hold forth . . ." Among the four was "a retired Air Force man and vaudeville writer," Sam Moore.[94] Kelly said Moore was a "dead ringer" for a senator – "white-haired, imposing and looks like a Harding . . . with a fine rolling voice and talks with a flourish."[95]

In 1958, he published another book, *U.S. Air Power: Story of American Fighting Planes and Missiles from Hydrogen Bags to Hydrogen Warheads*. Opening with the use of balloons in the Civil War, it covered "air power" writ large —Army, Navy, and Marine Corps. It related the roles, sometimes positive and sometimes not, of political, Congressional, Navy, and Army leaders. It covered great achievements alongside misplaced priorities and missed opportunities. Most criticisms were directed at the leadership of the Army, clinging to lessons of the Great War. Moore's journalist's tone makes it a smooth and valuable read.

Given the bitter contest for appropriations and control between the U.S. Navy and the new U.S. Air Force in the postwar period, the brief review of Moore's book in the *U.S. Naval Institute Proceedings* comes as a surprise. It judged the book "interesting and mature." It quoted Moore: "'With full appreciation of the aircraft-carriers' major contributions, there remains credit enough to be shared by all,' and of Korea, 'So long as air forces and armies must operate overseas, such need for sustainment by ships will remain unchanged.'" The review continued, "This volume deserves a reading by all airpower enthusiasts primarily because of its breadth of viewpoint."[96]

In the 1950s and 1960s, Moore was an occasional contributor to *Air Force Magazine*. By that time airmen were focused on the Cold War, the jet age, and missiles. Moore's articles informed them of the proud earlier history of the Air Force.[97]

Moore died in Falmouth, Massachusetts, on November 12, 1974. He is buried in Pine Hill Cemetery in his hometown of Westfield, MA.[98]

Fighter and writer

In France in 1918, Moore was in the action—a fighter —proving himself brave, capable, and versatile. As a Re-

servist or as a journalist after the war, he did not shy from the risks associated with flying the Air Mail or the National Balloon Races. Recalled to active duty in World War II, he sought overseas duty and served on staffs in the China-Burma-India theatre, joining the younger men on some combat missions. During the Korean War, his experiences qualified him to establish and command the USAF Air-Ground Operations School, and he traveled to Korea to get a first-hand look at operations there. After World War II, the Air Force tasked him to prepare large reports, so he was a military writer and editor too.

His greater contributions, however, were as a journalist and fiction writer. Those who wrote about air power in the periods before and after World War II helped give the air arms of the U.S. Army and Navy greater organizational prominence and independence, and they undergirded public support for more appropriations. Samuel Taylor Moore merits recognition among those who used their talent for words to keep air power in the public eye, setting the stage for the achievements of airmen in World War II and Korea. ■

NOTES

In these notes, all references to "Moore" are for Samuel Taylor Moore. All internet links were active in April, 2025.
The author acknowledges the research assistance of Gene H. Theroux of American Legion Post 124 in Westfield, Massachusetts, and salutes the continued work of Carl Warren Weidenburner of Linden, New Jersey, who has gathered extensive material on the China-Burma-India Theatre in World War II and placed it on the web.

1. Absent Moore's official military records, this article's biographical details, military and civilian, rely on: "Col. Samuel T. Moore; Was Newsman, Soldier," *Springfield Union*, 18 November 1974, 19, at: https://www.findagrave.com/memorial/ 52136071/samuel-t-moore#view-photo=202055049; "Col. Moore is Retired; Years in Air Force," *Springfield Union*, 25 August 1953, 2, at: https://masslive.newsbank.com/doc/image/v2%253A12AE935A497B0E8%2540NGPA-MASR-12C54D963766D60E%25402434615-12C063190AE8D9E6%25401-12C063190AE8D9E6%2540; "Plans to go fishing," *The Pilot* (Southern Pines, NC), 26 June 1953, 8, at: https://newspapers.digitalnc.org/lccn/sn92073968/1953-06-26/ed-1/seq-8/ocr/; and his WD Form 53, Military Record and Report of Separation, 23 October 1946. The sale of Moore's medals on ebay many years after his death occasioned another career review; see "Mexican Service WWI Victory Silver Citation Medal Ribbon Balloon Observer Group," at https://www.worthpoint.com/worthopedia/mexican-service-wwi-victory-silver-1826731077 (hereafter, "Mexican Service WWI Victory sale").

2. Bill Hatch, "Stray Bits," *Springfield Union*, 25 August 1953, 3, at: https://masslive.newsbank.com/doc/image/v2 %253A12AE9C35A497B0E8%2540NGPA-MASR-12C5963766D60E%25402434615-12C063190CAF178C%25402-12C063190 CAF178C%2540

3. "Union Has Man with the Second Regiment," *Springfield Union*, 27 June 1916, 1, at: https://masslive.newsbank.com/doc/image/v2%253A12AE9C35A497B0E8%2540NGPA-MASR-134F660C74F4B788%25402421042-134E182159DD42F8%25400-134E182159DD42F8%2540.

4. James W. Hurst, *Pancho Villa and Black Jack Pershing* (Westport, CT: Praeger, 2008), 101ff, 137-138. He judged, however, that among the National Guard units, the Second Massachusetts earned high marks.

5. Moore's stories, filed from the border, appeared in the *Springfield Union*. After mergers and reorganizations, that newspaper's issues can be accessed through the online archive of the *Springfield Republican.* I have compiled headlines and links in a separate document at: https://www.academia.edu/129794781/News_Reports_by_Samuel_T_Moore_of_the_Springfield_Union_with_a_Massachusetts_National_Guard_Regiment_during_the_Mexican_Punitive_Expedition_1916

6. For a thorough review of the operations of the First Aero Squadron during the expedition, see Roger G. Miller, *A Preliminary to War: The 1st Aero Squadron and the Mexican Punitive Expedition of 1916* (Air Force Historical Studies Office, 2003), at: https://apps.dtic.mil/sti/tr/pdf/ADA440092.pdf. Moore provided a compact retrospective on the operations of the squadron in his *U.S. Airpower: Story of American Fighting Planes and Missiles from Hydrogen Bags to Hydrogen Warheads* (New York: Greenberg, 1958) 44-46.

7. It's worth noting that a few months after its return to New England, the Second Massachusetts Infantry Regiment was again called to active duty, becoming the famed 104th Infantry Regiment of the 26th "Yankee" Division. During the First World War, it was the first foreign unit to be decorated with the French Croix de Guerre.

8. "Mexican Service WWI Victory sale" op cit.

9. Adam F. C. Fletcher, "History of the Fort Omaha Balloon School," 21 Nov 2016, at https://northomahahistory.com/2016/11/21/fort-omaha-balloon-school/comment-page-1/.

10. *The Balloon Section of the American Expeditionary Forces*, S. W. Ovitt and L.G. Bowers, eds. (New Haven: Tuttle, Morehouse, & Taylor Co., 1919), 28. He received Fédération Aéronautique Internationale license 126; see "Summary of U.S. Army Balloon Corps Officers WW-I (1917-19) Front Line," in Robert Recks, Who's Who of Ballooning, Appendix 2-AW, at: www.ballooninghistory.com/whoswho/appendix2AW.html.

11. USAF Unit History, 7th Balloon Company, at https://ww.usafunithistory.com/PDF/5-9/7%20BALLOON%20CO.pdf. The text is taken directly from *The Balloon Section of the American Expeditionary Forces*, op.cit.

12. Thomas A. Wikle, "Fort Still and the Birth of US Combat Aviation," *Chronicles of Oklahoma*, May 2019, 11, at: https://www.researchgate.net/publication/341117784_Fort_Sill_and_the_Birth_of_US_Combat_Aviation. Moore briefly discussed the AEF Balloon units in his *U.S. Airpower,* op. cit., 62-63.

13. USAF Unit History, 7th Balloon Company, op.cit. Moore related the incident, up close and personal, in "Upstairs and Down," *Collier's*, June 15, 1929, 32ff, at: https://ftp.unz.com/print/Colliers-1929jun15-00032/. He retold the story as "Shot Down: A thrilling adventure in the observation-balloon service on the Western Front," *Blue Book Magazine*, September 1933, at: https://archive.org/details/blue-book-v-057-n-05-1933-09/page/152/mode/2up.

14. For an overall view of the operations of the AEF's balloons in France, see Donald M. Bishop and Erik R. Limpaecher, "Looking Back from the Age of ISR: U.S. Observation Balloons in the First World War," *Air Power History*, Fall 2021, 7-18, at: https://afhistory.org/airpowerhistory/Air_Power_History_2021_f

all.pdf. Moore, "When Sausages Blazed in the Sky," *Air Force Magazine*, May 1963, 84-88, at: https://www.airandspaceforces.com/article/0563balloons/.

15. The Carlisle Indian School's most famous alumnus was, of course, the celebrated athlete Jim Thorpe. He and Herrera overlapped at the school for three years. Herrera's school records are available through the Carlisle Indian School Digital Resource Center at https://carlisleindian.dickinson.edu/student_files/pablo-m-herrera-student-file.

16. USAF Unit History, 7th Balloon Company, op. cit.

17. Moore discussed this unhappy period in his *America and the World War: A Narrative of the Part Played by the United States from the Outbreak to Peace* (New York: Greenberg:Publisher, 1937), 301-306. S.L.A. Marshall discussed the same period in his classic *The Armed Forces Officer* (Washington: Government Printing Office, 1950), 87-88, at: https://www.usna.edu/Ethics/_files/documents/SLA%20Marshall%20Armed%20Forces%20Officer.pdf.

18. Samuel Taylor Moore, "Portraits From My Military Album," *The Independent*, 12 April 1924, 203-204, at https://babel.hathitrust.org/cgi/pt?id=mdp.39015006958295&seq=545.

19 "Then and Now," *American Legion Monthly*, March 1930, 45f, at https://archive.legion.org/node/1640.

20. Moore, "Oh, to Be a Peacetime Aviator!" *American Legion Magazine*, 2 March 1923, 6, at: https://archive.legion.org/node/ 1151.

21. Moore, "The Uneasy Visit of R-34," *The New Yorker*, July 1957, p. 68ff, at: https://archives.newyorker.com/newyorker/ 1957-07-13/flipbook/068/. Two videos of the landing are at: https://www.youtube.com/watch?v=hvup77Zo0Uw and https://www.youtube.com/watch?v=lvp8XqNmHps&t=45s. The second video, by British Pathé , best shows the ground support so rapidly organized by Moore. For another account, see the Associated Press report, "Big Dirigible is Off Today for Second Oversea Trip," *Riverside [CA] Enterprise*, 10 July 1919, 1, at: https://cdnc.ucr.edu/?a=d&d=MPE19190710.2.23&srpos=30&e=———-en—20—21—txt-txIN-%22Samuel+T.+Moore%22———-. Moore revisited the event in his "Some of Them Made It," *Air Force Magazine*, July 1956, 115-116, at: https://www.airandspaceforces.com/app/uploads/1956/07/0756_July1956_LR.pdf

22. "Stearns-Moore Wedding," in the scrapbooks maintained by the Connecticut Historical Society, at https://chs.org/finding_aides/mmsocial/V43-March1919-July1919p.pdf, page 42.

23. 1930 Census entry for Samuel T. Moore. Mrs. Moore died in 1939; see https://www.findagrave.com/memorial/39797888/grace-moore.

24. "Col. Samuel T. Moore; Was Newsman, Soldier," *Springfield Union*, 18 November 1974, 19, at: https://www.findagrave.com/memorial/52136071/samuel-t-moore#view-photo=202055049; "Fox News Man is Speaker at Freeport Club," *Nassau Daily Review*, 30 December 1926, 1-2, See also *Rediscovering U.S. Newsfilm: Cinema, Television, and the Archive*, Mark Garrett Cooper, Sara Beth Levavy, Ross Melnick, and Mark Williams, eds. (Routledge, 2018), at: https://books.google.com/books?id=TWJgDwAAQBAJ&dq

25. A short article on the craft of writing included Moore's lighthearted take on distractions; see "Turns with the Bookworm," *Oakland Tribune*, 5 April 1936, 2-B.

26.Moore, "Smuggled Aliens," *The Independent,* 24 May 1924, 273ff, at: https://archive.org/details/sim_independent_1924-05-24_112_3869/page/272/mode/2up.

27 Moore, "Those Terrible Tabloids," *The Independent,* 6 March 1926, 264-266, at: https://archive.org/details/sim_independent_1926-03-06_116_3953/page/264/mode/2up.

28. Moore, "Fighting Rum Row: A Cruise on the 'White Terror,'" *The Independent*, 10 January 1925, 34-36, at: https://archive.org/details/sim_independent_1925-01-10_114_3893/page/34/mode/2up. Moore, "'Don't Give Up the Rum Ship': How the Admirals of the Rum-Running Fleet Accept the Coast Guard Challenge," *The Independent*, 17 January 1925, at: https://archive.org/details/sim_independent_1925-01-17_114_3894/page/66/mode/2up; Moore, "Rum Row—Finis: The Coast Guard Wields the Mop," *The Independent*, 24 January 1925, at: https://archive.org/details/sim_independent_1925-01-24_114_3895/page/92/mode/2up. The journal published a rejoinder by an anonymous contributor, "In Defense of the Coast Guard," *The Independent*, 3 April 1926, 380, at: https://babel.hathitrust.org/cgi/pt?id=mdp.39015012337286&seq=452&q1=Samuel+Taylor+Moore.

29. Moore, "America's Happy Drinking Ground," *American Legion Weekly,* 15 January 1926, 6ff, at: https://archive.legion.org/node/1028.

30. Moore, "Republican Patronage in South Carolina: Where Public Office Is a Private Debt," *The Independent*, February 1927, 149ff, at: https://archive.org/details/sim_independent_1927-02-05_118_4001/page/148/mode/2up; Moore, "Public Office on Easy Payments: 'Give to the Party as You Give to the Church,' is the New Slogan of the G.O.P. in Georgia," *The Independent*, 19 February 1927,203ff, at: https://archive.org/details/sim_independent_1927-02-19_118_4003/page/202/mode/2up; Moore, "Defenders of the Auction Block: Tracing Responsibility Back to Washington," *The Independent*, 5 March 1927, 258-260,at: https://archive.org/details/sim_independent_1927-03-05_118_4005/page/258/mode/2up.

31. *The Independent* ran the series in January and February of 1925. The four towns were Schenectady, NY, at: https://archive.org/details/sim_independent_1925-01-03_114_3892/page/28/mode/2up (p. 28) ; Scranton, PA, at https://archive.org/details/sim_independent_1925-01-17_114_3894/page/82/mode/2up (p. 82) ; Springfield, MA, at https://archive.org/details/sim_independent_1925-01-24_114_3895/page/110/mode/2up (p.110); and Paterson, NJ, at https://archive.org/details/sim_independent_1925-01-24_114_3895/page/110/mode/2up (p. 168).

32. Moore, "Mississippi Auction Block – New Style" *The Independent*, February 26, 1927 https://scholarworks.uni.edu/cgi/viewcontent.cgi?article=1031&context=hearst_documents ; Moore, "A Klan Kingdom Collapses: Behind the Scenes in the City that Once was Known as Klanopolis," *The Independent*, December 6, 1924, 473-475, at: https://babel.hathitrust.org/cgi/pt?id=mdp.39015006958295&seq=935&q1=; Moore, "How the Kleagles Collected the Cash: The Story of the Hoosier Sales Campaign - and Its Director." *The Independent*, December 13, 1924, 517-19, at https://babel.hathitrust.org/cgi/pt?id=mdp.39015006958295&seq=983&q1=Kleagles; Moore, "Consequences of the Klan: Results of the Hoosier Experiment in Invisible Monarchical Government," *The Independent*, 20 December 1924, 534-36, at https://archive.org/details/sim_independent_1924-12-20_113_3890/page/534/mode/2up. A later article documented the financial improprieties of a "militant leader of the Fundamentalists" who also promoted the Klan; see Moore, "Strange Bedfellows in the Supreme Kingdom," *The Independent*, 12 March 1927, 282-284, at: https://archive.org/details/sim_independent_1927-03-12_118_4006/page/282/mode/2up

33. Moore, "A Battle of Propaganda: The Inside History of the Bonus Fight," *The Independent*, 21 June 1924, 331ff, at: https://archive.org/details/sim_independent_1924-06-21_112_3871/page/330/mode/2up.

34. Moore, "Buddy Makes a Run on the Bank," *The Independent*, 29 January 1927. 131ff. at: https://archive.org/details/sim_independent_1927-01-29_118_4000/page/130/mode/2up.

35. Moore, "Aftermath of War," a review of *Tattered Banners* by Talcott Powell, *Saturday Review of Literature*, 4 March 1933, 467. at: https://archive.org/details/sim_saturday-review_1933-03-04_9_33_0/page/n5/mode/2up.

36. Moore, "Soldiers a la Carte," *American Legion Monthly*, August 1928, 18ff, at: https://archive.legion.org/node/1659.

37. Moore, "The New Preparedness," *The Atlantic Monthly*, October 1924, 443-449. https://www.theatlantic.com/magazine/archive/1924/10/the-new-preparedness/648191/.

38. Moore, "Fifteen Years Under the Sea: The Story of Capt. Frank T. Cable, Raise the Submarine from a Little Fish to a

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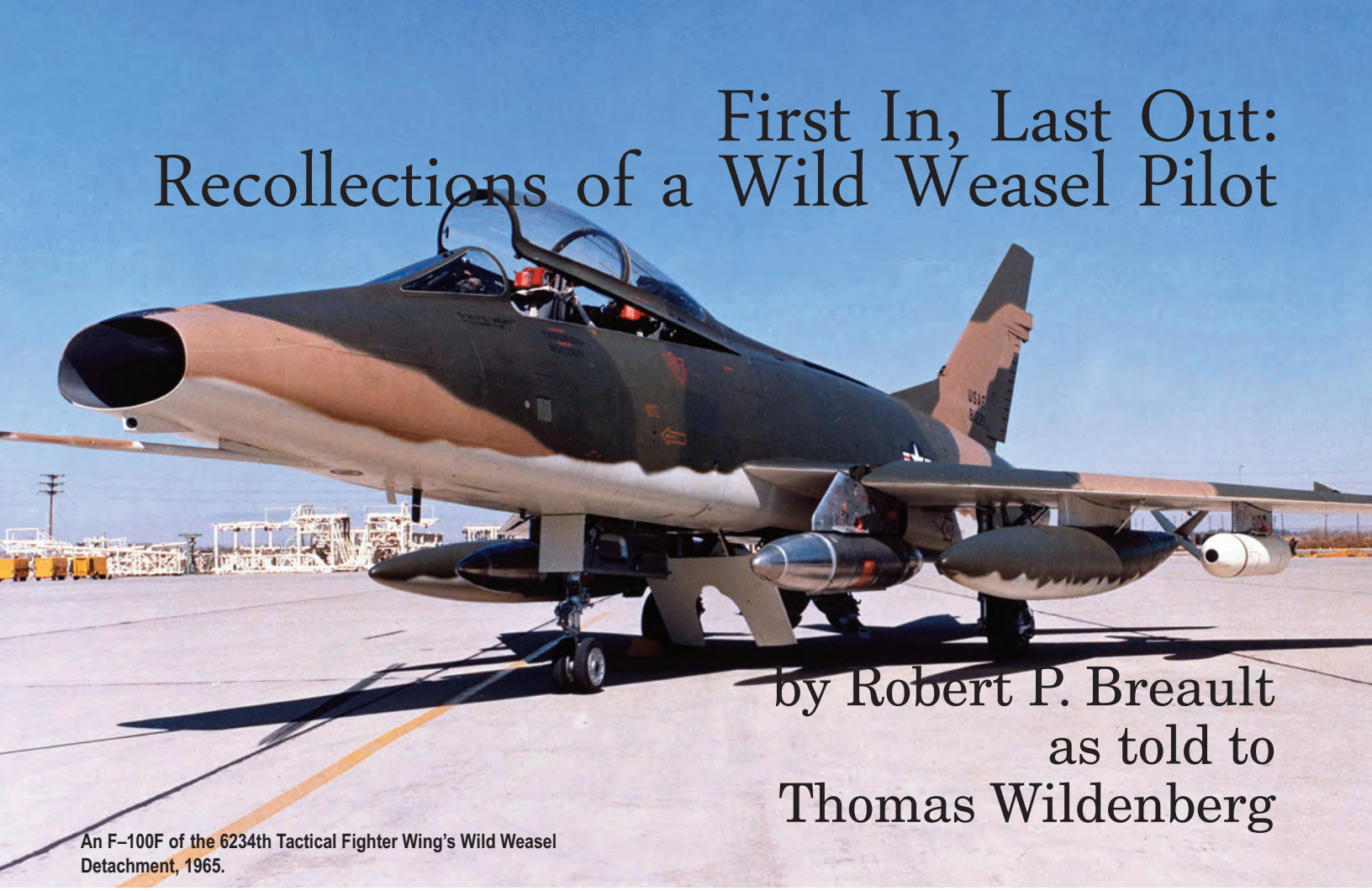
First In, Last Out: Recollections of a Wild Weasel Pilot



An F–100F of the 6234th Tactical Fighter Wing's Wild Weasel Detachment, 1965.

by Robert P. Breault
as told to
Thomas Wildenberg

Bob Breault claims that he decided to become a fighter pilot when he was in the seventh grade. By then, he had developed a keen interest in geology having hunted down and studied the crystalline rocks in the woods near his home in Naugatuck, Connecticut. As a youngster he also built and launched a number of home-made, gunpowder-propelled rockets. Most of his miniature missiles performed admirably, although one overloaded test capsule blew up spraying shrapnel over a two-story garage, a parking lot, and a two-story house before landing on a neighbor's second-floor porch. "It was in the summer of 1954, he recalled "that I decided to go to college and get a degree in mathematics, then go into the U.S. Air Force to become a fighter pilot, and then get a Ph.D. from the University of Arizona." A thoroughly thought-out plan that would prepare him for what he thought would be a career as a space explorer.

Bob started his college education at Yale University in the fall of 1958. "I knew that I would need a lot of math and electrical engineering. So, I majored in math, and I got my degree from Yale in four yours. My major was mathematics, but if I took one more course in physics, I would have had a dual degree. Two more courses in electrical engineering and I would have met the requirements for a triple degree; math, physics, electrical engineering." His science and engineering training would lay the foundation for his future success in and out of the Air Force.

After graduating from Yale in 1962, Bob embarked on his second career goal: he joined the Air Force in August and was sent to the Officer Training School in San Antonio, Texas, for three months and became a "90-day wonder." "I excelled, and I became a regular commissioned officer as a second lieutenant." He was immediately sent to Vance Air Force Base in Enid, Oklahoma, which, in Bob's experience was "in the middle of nowhere." He had a tough time adjusting mentally for "unlike Connecticut where I was born and raised, which had rolling hills and forests and that type of terrain, Oklahoma is flat as a pool table. You can see forever because it is so flat. It's a great pilot training place."

Bob got sick on each of his first eight flights and was about to be washed out. "My peers and the instructor pilots knew that I could fly, do spins, fly formation. It was just when they said go land that my anxiety level would peak as I was over self-critical and I would get sick [vomit]." Two of the captains in Class 64E suggested that he be tested for spatial

Editor's Note: This article is a memoir, drawn from the best recollections of the subject, Robert P. Breault, who did as he had planned, and got his Ph.D. (at age 38 not 36, in optical sciences) after serving in the Air Force. He turned down an offer to apply to the astronaut program after his graduation. He went on to a distinguished career as founder and Chairman of the Breault Research Organization. If his recollections vary from the documentary record, it is solely the responsibility of the subject, although I would suspect that Dr. Breault is more likely correct.

disorientation before he could wash out. They strongly felt that he did not have spatial disorientation. A couple of flight instructors felt the same way. They suspected it was anxiety. So, he went through the ice water spin test where they put ice water in your ear and spin you around in the chair to see if you become disorientated, and he passed. The two captains, Clint Hanna and Nev Heizer, had enough seniority and savvy on how the Air Force worked to convince the commander of pilot training to give him one more chance. The flight instructor he was reassigned to, Capt. Tom Wiley, was remembered by Breault, "as a really soft-spoken southern gentleman." Wiley's gentle manor eliminated Bob Breault's anxiety and by the second flight Bob had gotten over being sick. Bob Breault was never sick in an airplane again and eventually turned into a "hot shot" pilot.

"Flight training was magnificent and I loved it. I took to it like a duck to water. I immediately excelled at all the flying aspects of flying; formations, spins, barrel rolls, and near perfect loops and with high precision Immelmann. I did all the flight maneuvers very well. When it came to instrument training, I was always near perfect during pilot training and my first annual check ride one year later after I had joined my first operational squadron. I amazed the instrument check pilots with my tight performance. Three years in a row with different instrument check pilots — literally the first three check rides the check pilots tapped the dials to confirm that instruments were still working. I did not want the needles to move. So I was on speed, on altitude, on glide slope. It was exceptional precision. And one of them on my fourth check ride couldn't believe what I was doing. He said, 'Sorry Sir,' and turned the instrument off. Turned then back on. Then he said, 'I've never seen anybody before who could do that.'"

Bob graduated fourth in his class. Luckily, most of the senior officers in his class wanted to go multi-engine [presumably to fly civilian airliners upon retirement] because there were only two F–100 flight assignments for Class 64E and Bob got one. After completing F–100 training at Luke AFB, Arizona, he was assigned to the 614th Fighter Squadron at England AFB in Louisiana.

Thomas Wildenberg is an award-winning author with a special interest in aviators, military aviation, and technological innovation in the military and a frequent contributor to the Journal of the Air Force Historical Foundation. *He is a former Smithsonian Fellow having served successive terms as a Ramsey Fellow at the National Air and Space Museum in 1998 and 1999. Mr. Wildenberg is the recipient of a number of awards recognizing his scholarship. These include the Surface Navy Association Literary Award, an award from the Air Force Historical Foundation for the best article in* Air Power History *in 2009, and the John Laymen Award. He recently published* Spy Planes, Intruders and Wild Weasels: Electromagnetic Warfare in The Skies of Vietnam (2025) *from the Naval Institute Press.*

After taking leave, Bob Breault travelled to England AFB, Louisiana, in November 1964 where he joined the 614th TFS. He was the youngest pilot in the squadron and the only 1st lieutenant. His first mission was a practice mission to the bombing range in a flight led by Capt. Edward E. Seaman. As was typical of Bob's airborne adventures, this one too would be filled with unexpected excitement. After dropping their practice bombs, simulating a nuclear bomb attack, and firing two hundred rounds of blank 20mm ammunition, the flight received a radio request from a KC–97 tanker asking for the flight to "hit it," pilot talk for taking on some fuel. As he and the flight leader climbed searching for the tanker (the two other aircraft in the flight were low on fuel and had to return to base). Before they could locate the tanker, both aircraft hit bingo fuel [when fuel supplies necessitated a return to base or immediately refuel] and had to abort the refueling attempt. By the time they reached the airfield at England AFB, they were very low on fuel. As they began the landing approach, the control tower said to go into a holding pattern because the winds had changed and they needed to change the direction of landing. They did not have enough fuel for that, so Captain Seaman declared an emergency, overriding the tower. Because of the change in the wind direction, Bob had a 25-knot tail wind, was going too fast as he approached the apron, and had to circle round. He came in at a very low glide path on his second approach, came in at the right speed, flaps down and speed brake out and landed halfway down the runway. He hit the brakes as soon as he dared, pulled back on the stick to create as much drag as possible, and even raised the canopy to create even more drag. It was close, but he was able to turn off at the end of the runway.

Bob Breault's second mission with the 614th TFS was an aerial combat practice mission. One flight led by Capt. Harold M. "Hal" Sistrunk with Bob as the second element on his wing would be flown against a second flight led by Capt. William Hill. As Bob explained, "when airborne on an ACM mission rank was dropped. Anyone designated as the flight lead was the ranking pilot. Lieutenants got the chance to shoot down bird colonels with impunity. In this case rank wasn't an issue. Captain Sistrunk was the flight lead; he called the shots. Hal was one of the two best ACM pilots in the Wing. His reputation was at stake with this new untested lieutenant on his wing."

The mission briefing, given by Captain Sistrunk, was the shortest briefing Breault had in his seven years as a pilot. Sistrunk looked directly into Breault's eyes and said: "Lieutenant this is your briefing. Stay on my fucking wing! End of Briefing. Got it?" I quickly responded, "YES SIR!" there was a cold pause. "Lieutenant, most of the fighter pilots in the Wing can't do that. I don't want you to know what's up or down or where the other two planes are. That's my responsibility. All I want is that when I look over there on my wing, you be on my wing. Got it?" Again, I responded, "Yes, Sir."

They took off as a flight of four and climbed to 30,000 feet. Then Sistrunk and Breault split off and Captain Hill (he and Sistrunk were the two top aerial combat pilots on

Robert P. Breault, ready for the next mission.

the base) and his wingman broke in the opposite direction. Then, as Bob Breault related, "We turned on each other with a vengeance. The object was to get to the 6 o'clock position of the other flight. There were no rounds in the 20-mm cannons, but there was film in the gun camera. That was reviewed for who killed who. Both flights maneuvered hard. Both used great tactics of speed, altitude, afterburner, positioning, conserving speed, turning excess speed into altitude. Those who ran out of fuel because they failed to use it wisely had to break off the maneuvers and in spirit get shot down."

"I did take a few glances and saw the blue sky pulling dizzily by, or the ground coming up at us or spinning as we did. I also remember glancing in pain at the G-Meter. Often it was at the Red Line limit of 8 G's. My muscles hurt all over as I worked the lower body muscles to keep me from passing out. Weakening at all meant that I would fall off the wing of Sistrunk. He would pull away from me and I would have failed. We wore G-Suits to help keep the blood out of your legs and into the upper body, particularly in the brain. Blood loss to the brain was definitely not a good thing, especially at low altitude and you were pulling up from crashing into the ground. Even with the G-Suit most pilots would go faint at about positive 6 G's. At 2 negative G's all pilots would start to get Redout; too much blood in the brain. On positive G's, above 6 G's it became a feat of personal concentration and strength. Pilots did the G-maneuver. We had to tighten up our calf and thigh muscles to help push the blood up into our upper body against the 8 G pull of centrifugal force. A 200-lb pilot weighed three quarters of a ton. Most people could not even lift their own hands. I had two hands on the stick to help maneuver. We would lose four or five pounds in the hour of maneuvers of a normal ACM mission. It was a physical feat of a champion."

"Just about every time I glanced at the G-Meter it was just a hair off 8 G's, the Red Line limit of the plane. That was hard to do as one needed a lot of speed to do that and pulling 8 G's bled off speed fast. You couldn't have both, but Hill and Sistrunk were masters at keeping all they had. From the time I lifted off the runway until I touched down, only twenty-five minutes passed. Neither flight convincingly won over the other, but I learned a lot."

After landing the pilots all talked excitedly about the mission as they walked to the Chute Shop to put away their parachute, G-suit, and helmet before going to the squadron for the debrief. England's Chute Shop was a long, narrow building parallel to the runway fifty yards from the squadron building. As he entered the Chute Shop, he could see Sistrunk and Hill about 30 yards ahead of him talking enthusiastically about the mission. They never looked back, but as he walked down the center of the hallway, he could hear the pilots gasping out. "The lieutenant stayed on Sistrunk's wing." I must have heard that three times. Then there was a Captain that darted across the hall about 20 feet in front of me with a big grin on his face. As I passed the room he darted into, he was saying the same thing to three other pilots and all four were giving me a thumbs up sign and giving the "Way to go kid." All the pilots knew what I had just done and from then on, I was a 'made man'. I was something new in the wing. I had earned respect. I was most often called 'The Lieutenant' and everyone knew who I was as I was the only Lieutenant. But the active word was the respect in the word "The." [He's been known ever since as The Lieutenant, a moniker that remains in effect some sixty years later!]

A few days after the mission, Lt. Col. Lewis R. Blakeney, the commander of the 614th TFS, asked Breault to come see him. Colonel Blakeney asked if he would be willing to take an assignment as an Air Force Umpire in a winter war game exercise in Alaska called Polar Strike that was scheduled for January and February. The squadron had just come back from a permanent change of station assignment to Japan and Korea, he explained, which meant that most of the squadron's pilots, who were married men, had been separated from their families for six months. He wanted Breault, who was a bachelor and the most junior officer in the squadron, to accept the assignment. Now, everyone who serves in the military knows not to volunteer for anything. But what choice did Bob have? So, he said, "Sure, it sounds interesting," and he meant it.

In January, Lieutenant Breault was flown to Anchorage and from there to Eielson AFB. It was foggy on takeoff, but once they got up to cruising altitude it turned out to a clear day the scenery was quite spectacular. "There were just enough clouds," wrote Breault, "to make it a Kodak moment." Eielson AFB is in the middle of Alaska so Bob got a good look at the vast, mostly uninhabited, impressive terrain. When he arrived on the base, on the first night the nighttime temperature went down to minus 30 degrees Fahrenheit. The next day Bob was issued two winter flight suits, a winter parka, special bunny thermal boots, a pistol with ammunition, winter gloves. He was also informed that for the next week he would be going through Arctic Survival School. There were about four days of training and four days in the field. This did not bother him. Bob had al-

ready been to evasion and survival school so four days in the field was going to be cakewalk, or so he thought.

The Air Force pilots taking part in the war games were told ahead of time to bring the survival vests that they normally flew with. The vest contained a miniature flare gun, a butane lighter, a flight lighter, a survival knife, and a mirror. Bob also packed two stout candles, two cans of sterno fuel, noodle soup, candy bars and some hot chocolate; all banned items that he was not supposed to have. But, as he noted, "Going hungry was not going to prove anything compared to survival school."

At the beginning of the course, the students were taught how to manufacture an arctic shelter from a pilot seat, which would be available in the event they had bailed out. They were also shown how to make six other types of shelters. The igloo was the warmest, but it was not a likely choice where they were going because the snow was too dry and powdery. Another shelter that was a close cousin to the igloo was the snow pile house. They were also going to be given sections of a parachute, which they would have had had they bailed out. The nylon chute could be used in a few ways to make a shelter. They were also told about the small handsaw that was in their survival kit in the pilot's seat.

One morning Bob, and the other members of the class, were trucked out into the deep woods for four days in the field. Once on site, they were given their "survival" seats and told to go build the shelter of their choice. Bob chose to fell a small pine tree and cut the lower side of the branches off for his space, throw the parachute over the top side cover it with snow to create a well-structured tree house–on the ground. He pulled out the ten-inch saw indicated in the training, picked an appropriate tree and with two hands sawed it down four feet up the trunk. He used his right hand on the saw's handle and his left hand on the back of the saw to add pressure, but he forgot that the back side of the saw was a modestly sharp knife. It was sharp enough to slice though his leather pilot's glove, two layers of mittens and about half an inch of flesh in the bottom of his palm. He dropped what he was doing, decided that he would need stitches, and walked back to the instructor. "Sir," he said, "I screwed up. I just found out what that snow blade is. I need some stitches ASAP." He looked at Bob's bloody hand and said, "You sure do," turned around and calmly walked away. "Sergeant, are you going to call someone to take me in?" "No," he replied, you are in a survival situation and you just ruined one of the two best tools you have. Your hand. You are on your own. I can give you some iodine if you want it."

Bob was momentarily shocked; what was he to do. Then, remembered that he had bandages in his survival kit. He chose two small bandages and made two butterfly bandages. It worked great for the four days and by then the wound was "sealed" tight. His self-administered first aid functioned just fine. The severe cold probably thickened up in his cold hands, which helped to cut the blood flow. It was another lesson in teaching Bob the importance of self-reliance and strengthening his resolve to do whatever was needed to survive or succeed.

After taking care of his injured hand, he returned to where he had been working. He raised the cut portion of the tree onto the four-foot stump that he had now carefully made a small "V" so the tree would not roll off at some time. He trimmed the branches off the top and side, then piled snow on top with the small snow shovel in the survival kit. When he was finished, he placed his parachute bag in the entry hole and had a tight wind proof survival hut. After several days in the wild Lt. Breault and the rest of the survival class were "rescued." He was never hungry, but always dehydrated and was frequently required to melt snow for water.

After completing Arctic Survival School Breault was assigned to the team that would serve as umpires for the winter war games between the Blue Army, the good guys, and the Red Army, the bad guys. As the war started, Breault began to get his first inkling of what combat was all about. The Red Army led a surprise attack on a tank division of the Blue Army. The tank commander called for artillery. No one knew the coordinates well enough yet. He asked for air support, which was at least ten, maybe fifteen minutes away. At one point there was a communication breakdown. His command was being rundown by the Red Army. He was screaming for bloody help. Bob and the other umpires could hear him, but he couldn't hear the Blue Army's responses. They could. It was his receiver. "Is anyone there?" "Can anyone hear me?" "Is this damn equipment working? We are being overrun." To Bob, it sounded like the real thing.

The war games took place over a two-week period. From day to day, Bob would witness battles and air strikes by either side. He had charts and labels to tag the injured or killed. It was a lot of routine. It was hard on everyone as the environment was very harsh and unforgiving. One night, a track vehicle ran over two GI's and accidentally killed them. Bob and the other umpires moved with a Blue Army unit and lived off their food supply. If they went hungry, so did the umpires. If they got low on gas, so did the umpires. Getting enough gas was critical, if a vehicle ran out of fuel, the engine could freeze and be permanently disabled by the cold.

For the most part the exercise went smoothly. Bob was glad that he had taken part, because it was a seasoning process that prepared him in a non-life-threatening way for Vietnam. He quickly learned that communication is absolutely critical to winning. He found out that commands need to know who is where in any instant and that commanders needed to get responses and supplies on a steady basis.

After the exercise ended, the umpire unit was flown out in an Air Force helicopter. As they were loading up, one of the pilots who had been a classmate during pilot training, came up to Bob. They briefly chatted, before the classmate discreetly asked if Bob wanted some Huey stick [flying] time. The lead pilot agreed, so Bob packed his stuff in the back, crawled into the co-pilot's seat and waited for the team to finishing loading their stuff and board. Bob found the Huey easy to fly and it was very responsive.

Bob arrived back at England AFB in mid-February and rejoined the 614th with lots of "war" stories. "The Lieu-

tenant," as he was affectionately known throughout the squadron, became a routine fighter pilot again. He loved low-level missions, aerial combat mission, and range missions. He was very competitive, flew exceptionally well, and was getting better. By July he was the leading scorer in skip bombing and gunnery. One Saturday morning, Capt. William H. "Bill" Fletcher asked him to come in and go over his gunnery films. Saturday was not a normal working day, and Fletcher's request was unusual. Fletcher, who Bob says "studied them [Bob's gunnery films] like a sports coach studies opponent game films," spent two hours going over Bob's films analyzing his flying. Fletcher thought Bob was very good, telling him that when he trimmed the plane, he could take his hands off and it would still hold the piper on the target. He was very smooth on the stick and had great control.

"Let me explain how you could be even better." he continued. "What I want you to do is put a little forward trim on the stick, so the sweet spot in the middle, like in a car, it's a dead spot. You can wiggle the steering wheel and nothing happens. There's such a thing in an F–100 stick too, where you can move the stick and nothing changes. But if you put a little forward pressure on it, then you have total control. You're capable enough that you'll be able to do this."

Bob thought about this for a few seconds, thanked Fletcher for the advice, and then asked him why he wanted Bob to be better pilot. That month Bob was the Top gun in 20 mm and skip bombing for two Fighter Wings on the base and was number 2 in 20mm cannon. His name was up in the Officer's Club, not Fletcher's.

Captain Fletcher sort of shook his head with a little bit of disgust. "See this," he said pointing to his major insignia on his flight suit? "Yes," "See that," said Fletcher pointing to Bob's lieutenant insignia? "Yes, but what does that have to do with anything," he replied? I don't get your point?" "This means that when we go to war, all my senior people have gone to war. I'm going to be the flight lead and you're going to be my wingman. It's not going to be then that I'm wishing that I made you the greatest fighter pilot there was."

Although Bob had less than 210 flight hours in the F–100, he was one of the most qualified pilots in the squadron. You needed 400 hours to become a flight leader, but Bob's squadron and wing commanders got together, signed off and made him a qualified Flight Leader. "They put their name on the line that if anything had happened, if I did anything stupid, they would be held responsible for making me Flight Lead. It led me to fly as lead over other people who were senior to me. It got Colonel Blakeney in trouble [when we deployed to] Vietnam, because I was combat lead over senior pilots and they were not liking it, but I was qualified and more capable."

In May 1965, as the 614th TFS was getting ready to deploy to Misawa AFB, Japan, on a Temporary Duty (TDY) assignment, Bob's fiancée, Judi, came down to Louisiana to see him off. By now the pilots all knew about Judi and most had met her. By then Bob and Judi had decided to get married when he got back. While Judi and Bob's mother

A U.S. Air Force North American F–100F Wild Weasel I aircraft (s/n 58-1221) refueling from a Boeing KC–135A Stratotanker over Southeast Asia in 1965.

were visiting, he took them to New Orleans to see the town and its sights. Although a normal TDY assignment was for 60 days, the previous two squadrons sent on TDY had stayed for 5 ½ months, so Bob set the wedding date for November 27, 1965.

A few days after their trip to New Orleans, the squadron departed. Now this is a big event. Judi was allowed to climb into the cockpit and put Bob's helmet on for a picture. They hugged and kissed, and then, one flight at a time the pilots mounted their planes, waved goodbye, lowered their canopies, taxied to the runway and took off.

Once airborne, each flight of four would join up for the ten-hour flight to Hickam AFB on the island of Oahu in Hawaii. They met up with a tanker around the Arizona-California border and began refueling one by one as they got over the Pacific coast. Although each F–100 had a fuel capacity of 12,000 pounds with their outboard drop tanks, they were limited to take 3,000 pounds at a time. Otherwise, the last aircraft in line, which happened to be the one piloted by Bob Breault, would have run out of fuel while the other F–100s filled up. To get to Hawaii the flight had to make eight refuelings. The overwater flight to Hickham was a long, lonely, grueling, exhausting trip, which required Bob to say "sharp" for each of the refuelings. These were not easy, as pilot error or turbulence would rip off the refueling basket.

After spending the night at Hickam, Bob's squadron took off on another long flight over the Pacific. To pass the time, Bob depended upon the two bags of peanuts that had been included in the box lunch that each pilot had been given. It was his only source of entertainment and helped him stay alert. He would take one whole peanut out of the bag, break it in half, and remove the nub at the top between them. Then, he would undo his oxygen mask, which was somewhat risky 34,000 feet where oxygen was needed to stay conscious. He put one half of the peanut in his mouth and put the mask back on, and then chew on it. Next came the other half with the same routine; then the nub. It would easily take 45 minutes for him to eat one bag of peanuts.

Bob Breault spent the next nine months (except for a few excursions to Kunsan AB on the west coast of South Korea) with the 614th TFS operating out of Misawa AB in the northern part of Honshu Island (Japan) 425 miles

An F–100 Super Sabre of the 6234th TFW Wild Weasel Detachment.

north of Tokyo. As expected, the TDY exceeded ninety days, but he had the foresight to arrange for leave in time to attend the wedding he had planned. He departed Misawa on November 17, ten days before the scheduled nuptials.

Bob Breault married Judi Santucci as planned on November 25, 1965. The ceremony, which took place at Saint Patrick's Church in Farmington, Connecticut was followed by a reception at Cooks Tavern in Plainville, Connecticut. After spending the night in the New York Hilton, they flew to San Francisco where they spent a six-day honeymoon staying at the Mark Hopkins Hotel. They returned to Connecticut to revisit their families and pick up Bob's Mustang which they hitched to a U-Haul trailer, then drove all the way to England AFB.

Bob Breault returned to duty on December 15, 1965. Three days later, he received an unexpected notification advising that he had an assignment to go to Eglin AFB in Florida for a Wild Weasel Assignment. It was a top-secret program that even Lt. Col. Blakeney, the 614th's commanding officer had difficulty finding out about. He told Breault, that because he had been promoted to a flight leader, had no overseas tours, and "looked like a hotshot pilot," his name has surfaced to the top of a list for a very dangerous mission. There was going to be some training involved and he wanted Bob to intentionally fail the training to avoid the mission. Bob said he couldn't do that. He was likely that some other person in the squadron would be drawn and he would regret it the rest of his life if some other pilot got killed in his place. Despite Bob's willingness to take the assignment, Colonel Blakeney felt that he did not meet the qualifications that were specified; he was only a lieutenant with just about one-years' worth of squadron experience, and was not qualified to lead senior pilots into live combat. So, Colonel Blakeney got the orders rescinded, or so Bob thought.

Just before Christmas, Breault was in the apartment in Alexandria, Louisiana, that he had just rented for Judi and himself, when he opened a letter from the Air Force. He was expecting that it was a formal notification advising that he had been dropped from the Wild Weasel program. Instead, it was orders to report on January 3. Needless to say, Bob Breault was furious, if they had left the assignment as stated on December 18, he would have had more time to decide what they were going to do with the apartment.

Towards the end of January 1966, Bob Breault was sent to North American Aviation's facility in Long Beach, California, to be briefed on the two seat F–100F that had been converted into a Wild Weasel and be indoctrinated in the electronic suite developed by Applied Technology Incorporated (ATI) that detected, identified, and located the radars used by the North Vietnamese surface-to-air missiles (SAMs). The highly dangerous mission of the Wild Weasels was to locate the North Vietnamese SAM sites and to lead the F–105s that would attack and destroy the site.

The Wild Weasel program emerged out of the task force convened by Brig. Gen. Kenneth Dempster, deputy director of Operational Requirements and Development, for solving the problem of the surface-to-air missiles introduced by the North Vietnamese. Based on the recommendations made by the task force, Dempster's office began to formulate a plan to provide tactical aircraft with a means of hunting down SAM sites by homing in on their radar emissions. They were encouraged by the demonstration given to Dempster's task force by the Applied Technology Incorporated (ATI) Vector IV radar homing receiver and the data presented on their IR-333 panoramic receiver. It was quickly decided to equip the two-seat F–100F with both devices.

The two-seat F–100F was the ideal candidate for the Wild Weasel role. In addition to the second seat, which was needed for the Electronic Warfare Officer (EWO) assigned to operate the radar warning and homing gear, the F–100F had similar flying characteristics to the F–100D that was optimized for ground attack. It was also fast and had space to accommodate the system's electronics. The F–100F was a relatively inexpensive aircraft too and was readily available. To meet Dempster's requirement, four low-flying-time F–100Fs were selected and flown to the North American Aviation facility in Long Beach, California, where they were to be modified under an Air Force contract. These four, under the command of Maj. Gary A. Willard, Jr. arrived at Korat Royal Thai Air Base on November 25, 1965 and began a sixty-day operational trial period three days later.

As the first Wild Weasels began operations in Vietnam, Lieutenant Breault was sent to Long Beach for several days of "book training" and orientation in a classroom setting to learn about ATI's radar homing equipment. The instructor "explained what the instrument was and how it was designed, engineered and the concepts of it and what it could do and what it didn't do" After becoming familiar with the equipment and its operating principles, Bob, along with the other the small group of pilots and EWOs the Wild Weasel IB program, were sent to Eglin Air Force Base in Florida to test out and familiarize themselves with the radar warning and detection that had been installed in three or four more F–100Fs.

Like every pilot that first flew at Luke AFB, he had had a check out flight in the two-seater with a check pilot

Robert Breault in front of his North American F–100F.
(U.S. Air Force photo.)

in the back seat. Initial training with the check pilot in the back and then soloing was the normal evolution for an F–100 pilot. So having a having an Electronic Warfare Officer in the back didn't bother him in the least. "It didn't confuse me at all. But there were some experiences [in Vietnam] where I would be more cautious as I was risking someone else's life. That said, I scared the daylights out of my EWO on a few of our North Vietnam missions."

Training at Eglin began on February 2, 1966, and involved eight straight days of what he considered "nonsense flights" lasting from about one and a half to one-and three-quarter hours each. "We would go out over the Gulf, head back to the coast, and turn around and watch the 3-inch CRT display included in ATI's system that indicated a source of radar tracking us. It was almost like turning on an ADF [automatic direction finder] radio signal. The small screen was mounted on the dash panel and only indicated the direction. My job was to put it at 12 o'clock position and fly towards the tracking radar. The SADS-1 radar that I used to train on was a copy of a Fan Song radar used by North Vietnamese to guide the SA-2 anti-aircraft missiles that had been supplied by the Soviet Union. It had been fabricated and delivered to Eglin by the Army's Harry Diamond Laboratory and installed in the open on top of a white painted building." Bob would fly right at it until he could see it, which would be situated in the middle of the SAM missile site he was trying to locate. It was easy to see providing a false sense of security, for this would be nothing like the situation in Vietnam, where Bob would have to try and locate the radars hidden in the well-camouflaged, heavily defended SAM sites in Vietnam.

As soon as their training was complete, in mid-February, Bob and his EWO, Capt. James A. Peterka, and the other two crews from F–100F Wild Weasel Class 65WW were dispatched to Vietnam to meet the urgent need for additional Wild Weasels to suppress the SAMs. 1st Lt. Bob Breault was the only lieutenant in the three crews that flew from Eglin Air Force Base to the Royal Thai Air Base at Korat, Thailand. The long flight required multiple air-to-air refuelings with stops at Hickam AFB on Oahu in Hawaii and Clarke AB in the Philippines. After landing in Korat, Bob Breault and the other members of the flight were assigned to the 6234 Tactical Fighter Wing's Wild Weasel Detachment that had been established when the first cadre of Wild Weasel pilots and their F–100Fs arrived in late November.

A few days after his arrival, Bob was confronted by Capt. Alan T. Lamb, a member of the first cadre who had gained fame and distinction when he became the first Wild Weasel pilot to destroy a SAM site on December 22, 1965. All the Weasel crew members were present. Lamb felt that Lieutenant Breault had too few hours to be Flight Lead Qualified and should not have been sent there. He expected that to be qualified as a Flight Lead, a pilot had to usually have at least 500 hours in his aircraft and have exhibited high leadership skills. Some pilots didn't achieve Flight Lead Status until after 1,000 hours in the plane. In response, Bob said, that yes, he had been made a Flight Leader after just 200 hours of flight time.

Lamb screamed that Bob wasn't, "He is lying. He does not have the required flight time to be Flight Lead." A yelling match ensued and they almost came to blows until Breault, who was bigger and stronger, jerked Lamb by the collar of his flight suit forcefully into the office of Maj. Gary Willard, the unit's commander. Bob knew where the personnel files where kept. He went to the file cabinet containing his and pulled it out of the file cabinet, opened it up and with some vulgarity said, "Read it out loud to everyone." Lamb did, and reluctantly stated, "That Lieutenant Breault was qualified." "Maybe it took you 1200 hours to get qualified," Breault replied, "it took me 200." The was the end of it, but the two men, as Breault later stated, "had a strained relationship."

Bob flew for the first time from Korat on February 22, when he made a one-and-a-half-hour non-combat orientation flight to familiarize him with the local surroundings. He flew his first combat mission three days later, on February 25. It was an Iron Hand mission to search for a SAM site. The mission brief was conducted by Wing Commander Col. William D. Ritchie, Jr. who laid out the flight plan making sure that the pilots understood the rules of engagement that restricted attacking anything within a 30-nautical mile circle from the center of Hanoi—the capital of North Vietnam. And in the briefing, he made a very important point that he was in charge of the navigational route. This was because the F100F Weasel had no Doppler or GPS type of navigational capability and the F–105D did. This point played a significant role in multiple ways on the ensuing mission.

U.S. Air Force Republic F–105D Thunderchief fighters of the 355th Tactical Fighter Wing at Takhli Royal Thai Air Force Base in 1966.

The F–100F Wild Weasel most often played an escort role. A flight of four F–105Ds and the lone Wild Weasel were assigned a target to strike someplace in North Vietnam, hence the term strike mission. On a strike mission, the role of the F–100F Wild Weasel was to detect if a SAM site came up or at least intimidate the site to stay down or shut down. If they did come up and stayed up then the mission was changed to take the SAM site out. In which case the Wild Weasel would engage the active SAM site that would come on and call out the threat to the strike force lead. After the strike force had delivered their ordnance and were exiting the target area, the Wild Weasels would turn back into the target area to cover their withdrawal. The Wild Weasels were the first in and the last out, which became their motto.

Breault's first combat mission, flown on February 25, 1966, was led by Colonel Ritchie himself. It consisted of four F–105s that were assigned to search out targets in North Vietnam. If a SAM came up Bob's F–100F was supposed to locate and mark it using a combination of 2.75-inch white phosphorous rockers and 20-mm cannon fire. The four F105s would change their assigned mission to SAM killer. This meant that Bob was going to have to fly at the head of the strike force over some of the most heavily defended targets to that point in air warfare, mark the target, and pullout 800 feet above the ground. The F–100F was taking a high risk. If the site fired a SAM, that more or less gave away where to look for the control van. Take the van out and all the other missiles were no threat.

It was a beautiful morning in Korat when Bob apprehensively stepped into the cockpit of his F–100F in the early morning on the day of his first high-risk strike mission. "It's funny how you remember little things," he told me. "The tower, when he checked in," he recalled, "advised that the temperature was 82 degrees Fahrenheit and the wind was mild at 5 knots." He felt some anxiety from the knowledge that he was the only junior officer on the flight and knowing too that the general impression of the other pilots was that he wasn't completely qualified based on his flying hours, which were much lower than any of the other pilots by a lot. The flight flew northeast across Thailand and a small section of Laos before reaching the southern border of North Vietnam, at which point Bob remembers that his anxiety rose more; "Maybe we'll make it, maybe we won't." he thought. When they reached the Gulf of Tonkin, the flight turned north and began to follow the coastline, which looked very pleasant and nice, according to Bob's recollection. But things began to change when the flight turned northwest just south of Haiphong.

"I looked down and my right side about 80 degrees to my right and I saw the Haiphong dockyard and on the dock were some SAM missiles crates, ready to be shipped inland. OK, I know what those are, but the command and control or rules of engagement prohibited us from striking them. This was incredible to me."

As Bob flew on searching for a SAM site, the F–100F's IR-333 panoramic receiver began to pick up radars, first one, then another until they were being painted by at least three radars tracking the flight. "They knew it was the Weasel mission because flight had five aircraft which was a very unusual formation and that they're playing with my F–100F, which had a larger radar greater cross section than the F–105. So, they knew. This was the mission, the missile hunt mission." Later on, the North Vietnamese learned to recognize the radar return of a five-plane strike flight and would often shut down their radar when they saw an Iron Hand mission coming to avoid detection. This was especially true after the introduction of the Shrike anti-radiation missile, which also had a highly recognizable radar signature.

Suddenly the CRT Scope lit up. A SAM radar was painting them in the direction of Hanoi and nearby KEP airfield, the major MiG base. Bob led the flight due West to avoid KEP. He did spot the runway however, and was relieved to see no planes taking off. But the flight path was now directing them towards Hanoi, which would place them within the restricted zone around Hanoi.

"This was not good," as Bob explained. But that flight path directed them directly towards Hanoi. "As I proceeded west and got to the outskirts of Hanoi the signal got stronger and stronger which meant it was maybe west of Hanoi. Not by much, but that led us directly over Hanoi. As I got closer to the suspected SAM sight, the strobe on the 3-inch Vector IV's CRT display pointed in the direction of the Fan Song radar that was at the heart of the SA-2 system. Watching the scope and doing some mental calculations, I led the flight to just one mountain range north of the suspected valley and put a low mountain ridge between them and the SAM site to their south. After passing Hanoi, I took the flight low over the jungle, which broke the lock on by the SAM's radar. I would pop up and view the scope to get a new vector to its location, mentally triangulating where I wanted to make the attack."

As the signal grew in intensity, Peterka in the backseat was busy monitoring the panoramic receiver analyzing the various radars tracking the Wild Weasel. Bob knew from the CRT tube indicating the source position that the SAM site they were trying to locate was in a particular valley, so he used the surrounding mountains to hide from the Fan Song radar so they wouldn't be able to track him, popping

The Wild Weasel Detachment at Korat Royal Thai Air Force Base, 1965.

up every once in a while, to make sure that he was keeping track of the radar's site. When he thought he was close enough, he made a sweeping 90 degree turn climbing to 9000 feet over the last mountain range and then dove down watching the strobe until he was lined up on the radar, calling to the strike leader to set up hot for the dive-bombing attack on the site. He had the F–100F aligned so the strobe was right at the 12 o'clock, and he is looking down at the jungle trying to find this missile site, the van which was hidden in a village, or even heavy electrical cables that ran from the van to the missile launchers, or maybe the missile transporters, hoping the antiaircraft crews hadn't manned their weapons yet.

It was still very early in the morning and the ground haze in the valley hadn't burned off. All he could see was the little hamlet of small houses. The four F–105Ds Bob was leading were all looking for the SAM site too, but were not able to locate it either. Bob must have passed just a few hundred feet right over the radar van without seeing it. Having alerted the enemy, a second pass would be senseless as it would undoubtedly expose them to very heavy anti-craft fire. So, Bob told the strike group to go to their assigned alternate target, which they did.

What Bob didn't know was that the SAM site he had been attempting to have the strike group attack was 27 nautical miles from the center of Hanoi—a bit within the restricted zone established by the rules of engagement. If they had been successful, he might have been reprimanded or even court marshaled for disobeying the rules of engagement.

When he landed back at Korat and had just deplaned, one of the F–105 pilots in the flight—a major who had just landed—came running at him yelling and screaming that he was going to beat the living daylights out of Bob for taking them over Hanoi, which was the most heavily defended air space in the entire world. Colonel Ritchie immediately stepped in between them and separated the two pilots before any fisticuffs began.

"Remember the briefing?" he told the major. "The lieutenant was following my orders. So, if you have anything you want to do to him, you do it to me" And that was the end of it.

That afternoon, Alan Lamb went back to the SAM site location whose position was now known and took it out, knowing full well that it was within the restricted zone. The after-action report, as Bob tells it, debriefed by intelligence, marked it as two miles outside the circle. The original site, according to the record, never existed.

Bob flew eight more Wild Weasel missions in the F–100F between February 26 and March 20, but was never able to locate a hot SAM site. Trying to locate the heavily camouflaged equipment, which at times was completely hidden in wooden areas, proved more difficult than the Air

An Air Force F–100D Super Sabre aircraft fires a salvo of 2.75-inch rockets against an enemy position in South Vietnam. Super Sabre pilots are noted for their accuracy during bombing and strafing runs with the supersonic fighter.

Force leaders had anticipated. The Vector IV's lack of ranging data aggravated the problem, forcing the Weasels to overfly the site before an accurate location could be determined. This subjected the F–105s to the fire from the multiple anti-aircraft guns that the North Vietnamese situated around the site and cleverly camouflaged.

By the time of Bob's last mission was flown on March 20, three of the first nine F–100Fs sent to Southeast Asia had been lost to ground fire and one airframe had been overstressed beyond repair. The remainder were so damaged that not enough Wild Weasels planes were available to support operations above the Red River delta, which were suspended until the next batch of Wild Weasels based on the F–105Fs airframe began to arrive at the end of May 1966. (See Thomas Wildenberg, *Spy Planes, Intruders, and Wild Weasels: Electronic Warfare in the Skies Over Vietnam*, (Annapolis, MD.: Naval Institute Press, 2025), p. 82.)

After the F–100F Wild Weasel flights were temporarily suspended, Bob was sent back to the 614 TFS at England AFB. He returned to Southeast Asia in mid-September when the 614TFS was sent to Phan Rang AB, South Vietnam. When he completed this tour, he was assigned to Nellis AFB, Nevada, in August of 1967 as an F–100 Wild Weasel instructor with the 4536th Fighter Weapons Squadron.

As he was in flight to Nellis, the Air Force brass killed the F–100 Weasel program, replacing it with a program based on modified two-seat F–105s. Upon arrival, Bob, having no other duties now that the F–100 Weasel program had been killed, was assigned to the Fighter Weapons News Letter editorial staff. During his tenure with the Fighter Weapons News Letter staff, he wrote several articles, including three highly critical of the command-and-control structure in Vietnam that were not published. Col. Buck White, the wing commander, did not condone the critical comments on the command structure in Vietnam and refused to allow them to be published.

As the months went by at Nellis, the air staff were looking for a piloting assignment for Bob. Colonel White secured an assignment as a squadron pilot in the 4481 TFS flying the F–111A, which would require Bob to receive training in the new aircraft in order to qualify to fly. But in accordance to Air Force regulations, this required a three-year involuntary commitment to remain in the Air Force. Bob Breault still wanted, and had planned to get a Ph.D. by the age of thirty-six. Time was running out and he did not want to spend another three years in the Air Force, so he submitted his resignation.

Thirty minutes after submitting his resignation Colonel White's secretary called Bob and told him that the colonel wanted to see him in his office the next morning promptly at 7:30 am in dress blues. It was the only time Bob ever wore dress blues at Nellis, and 8:00 am was the normal duty call. When Bob showed up the next morning, he found out that Colonel White was livid about Bob's resignation. No one before had ever resigned from the Fighter Weapons School as an instructor. It was a black mark on Colonel White's record. As Bob recalled:

"He gave me a chewing out replete with four letter words that lasted for 30 minutes, with me at attention and him circling me all that time. It's hard to imagine that one could make complete sentences with almost just four-letter words but he did it well. He yelled that I was a lousy officer. Here I was resigning a regular commission, because I got an assignment I didn't like. A regular commission meant that if there were a reduction in force in the Air Force, I could not be riffed [a reduction in staff]."

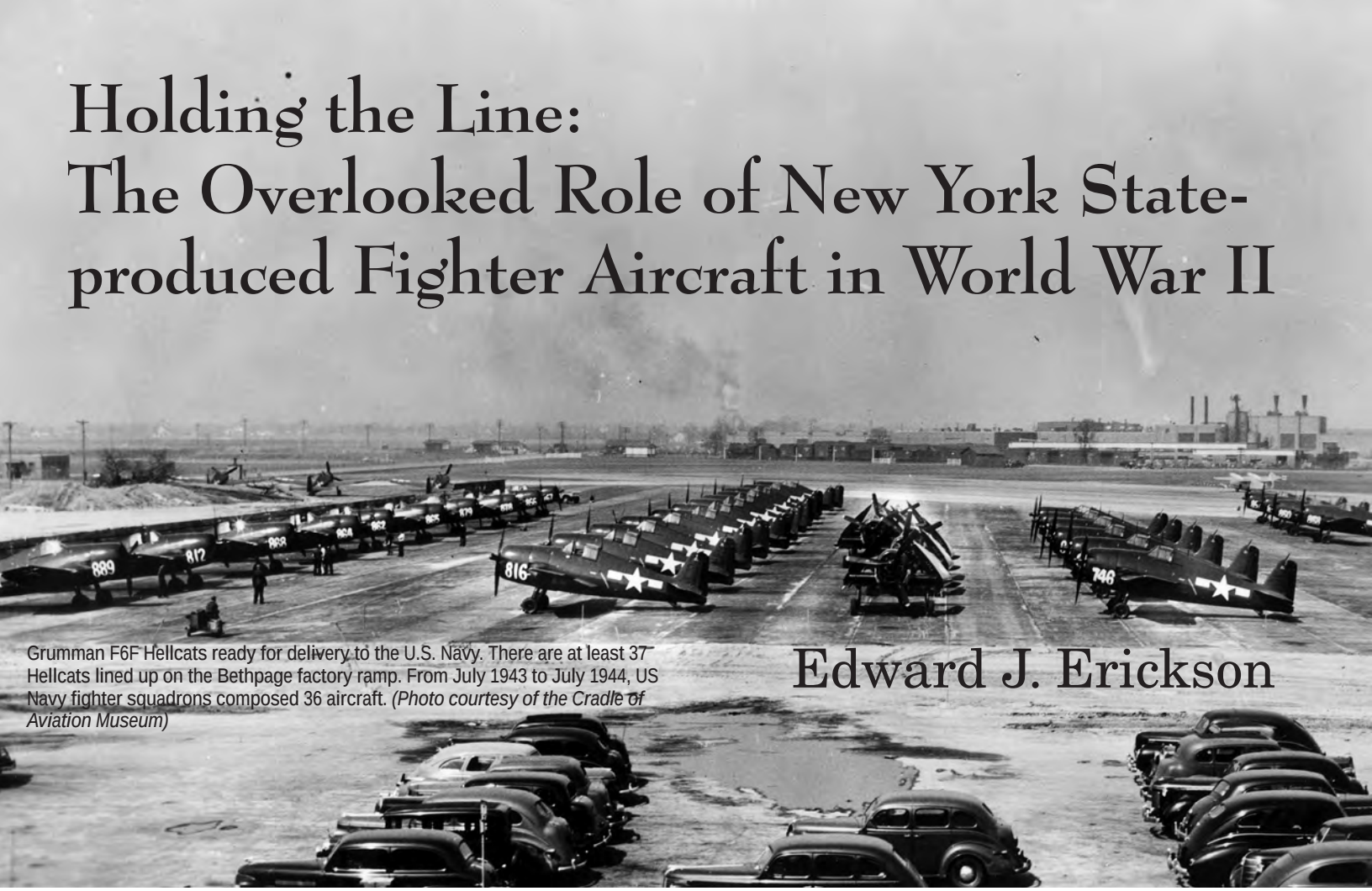
I responded, "Sir, it isn't the assignment, it is the timing. I need my Ph.D. soon if I want to be an astronaut." "What makes you think you are qualified to be an astronaut captain?" "I have the training, the education, the experience and the motivation." "Well, God damn it, I'll agree you have the motivation."

Since Bob was a regular commissioned officer, Colonel White had the legal authority to involuntarily extend Bob's service in the Air Force for one year. He did, and it doomed Bob for assignment as an air operations office with the 474 Tactical Fighter Wing for the remainder of his service.

As is turned out, it was not all that bad for Bob. First, twelve days after he received his chewing out, Colonel White had to pin a Silver Star on Bob that was awarded for valor in Vietnam. White could not avoid such an important ceremony without looking like a fool. Second, from then on, his new assignment allowed Bob to fly as often as wanted to, and more or less anyplace he wanted, except for the gunnery range, and he was able keep all of his flight rating up to date. Lastly, he found time to take courses in physics at the University of Las Vegas that helped him get into graduate school.

Bob Breault left the Air Force in August of 1969 to pursue a Ph.D. in Optical Sciences at the University of Arizona. He received his Ph.D. in 1979 and became one of the leading experts in optics design. Since then, he has been involved in the design of just about every major telescope in the world and was instrumental in establishing the Tucson Optics Cluster. ■

Holding the Line: The Overlooked Role of New York State-produced Fighter Aircraft in World War II



Grumman F6F Hellcats ready for delivery to the U.S. Navy. There are at least 37 Hellcats lined up on the Bethpage factory ramp. From July 1943 to July 1944, US Navy fighter squadrons composed 36 aircraft. *(Photo courtesy of the Cradle of Aviation Museum)*

Edward J. Erickson

During World War II (1939-1945), successful combat operations hinged on the achievement of air superiority over the battlespace. "For military aviators, *air superiority* is an unquestioned prerequisite for effective aerial operations."[1] The United States defines air superiority as "that degree of dominance in the air battle of one force over another which permits the conduct of operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force."[2] The concept of air superiority dates from the First World War and manifested by "the emergence of the fighter airplane."[3] In the World War II, the instrument of air superiority was the single-seat fighter flying during daylight hours.[4]

The United States Army Air Force (USAAF) achieved air superiority in Europe by the end of May 1944 at the conclusion of the Pointblank operations.[5] The United States Navy (USN) achieved air superiority in the Central Pacific in June 1944 at the end of Operation *Forager*.[6] Pointblank and *Forager* represent what Carl von Clausewitz identified as the Culminating Point in military operations, defined as the point at which the enemy is no longer able to successfully conduct its operations. After June 1944, neither Germany or Japan could produce the capability and capacity to conduct successful aerial operations. Control of the air was decisive because the offensive and amphibious campaigns necessary to end the war: Normandy, the Ardennes, Saipan, and Okinawa for example, were impossible without air superiority.

This article presents the thesis that the single-seat daylight fighter aircraft was essential in securing the allied victory in World War II and that fighters produced by New York State aircraft manufacturers played a significant and overlooked part in achieving air superiority in the decisive theaters of war. Five New York State aircraft companies, Bell and Curtiss in Buffalo and Brewster, Grumman, and Republic on Long Island produced 52,239 single-seat fighters or 52% of the total output of the country from 1939-1945.[7] These fighters, particularly the Republic P–47 and the Grumman F6F, enabled the USAAF to dominate the German Luftwaffe (the German Air Force) in Europe and the USN to dominate the Japanese Navy in the Pacific.[8] Other fighters, both American and allied, would complete the destruction of Germany and Japan's air arms in 1945, but the aerial Culminating Point in the decisive theaters came about through American fighters produced in New York State.

New York State's Aviation Companies

It is hard to imagine that in 1939 and 1940, other than a single aircraft, no American aircraft manufacturer produced fighter planes outside of New York State. Even in 1941, New York State produced 3,948 of a total 4,333 fighter aircraft

Table 1. American Single-Seat Fighter Production, 1939-1945

Produced in New York State

Type	1939	1940	1941	1942	1943	1944	1945	Name/Total
Bell P–39/P–400	0	13	926	1932	4947	1729	0	Airacobra
Bell P–59	0	0	0	0	0	0	66	Airacomet
Bell P–63	0	0	0	0	203	2857	248	Kingcobra
Brewster F2A/B–339	0	166	309	22	0	0	0	Buffalo
Brewster F3A/F4U	0	0	0	0	136	509	0	Corsair
Curtiss CW–21	62	0	0	0	0	0	0	Demon
Curtiss P–36/H–75[1]	335	464	46	0	0	0	0	Hawk
Curtiss P–40	0	778	2248	3854	4258	2002	0	Warhawk[2]
Grumman F3F	27	0	0	0	0	0	0	None
Grumman F4F	0	106	324	1447	100	0	0	Wildcat
Grumman F6F	0	0	0	10	2547	6140	3587	Hellcat
Grumman F7F[3]	0	0	0	0	0	31	34	Tigercat
Grumman F8F[4]	0	0	0	0	0	0	208	Bearcat
Republic P–35[5]	15	105	0	0	0	0	0	Seversky
Republic P–43[6]	0	13	94	165	0	0	0	Lancer
Republic P–47	0	0	1	516	3026	3910	1643	Thunderbolt
Contract P–47G[7]	0	0	0	6	271	77	0	Thunderbolt
Total	**439**	**1645**	**3948**	**7952**	**15488**	**17255**	**5512**	**52239**

* Larry Davis, P–35, Mini in Action, (Carrollton, TX: Squadron/Signal Publications, Inc., 1994), 22.

** For example David R. McLaren, *Beware the Thunderbolt! The 56th Fighter Group in World War II*, (Atglen, PA: Schiffer Publishing, Ltd, 1994), 14-98 and Roger A. Freeman, *56th Fighter Group*, (Oxford, UK: Osprey Publishing, 2011), 24-43 present numerous photographs and plates showing only RE serial numbered P–47s in the 56th FG before August 1944. See also The Republic P–47 Thunderbolt https://www.368thfightergroup.com/P-47-2.html, accessed May 15, 2023, for a complete listing of Thunderbolt serial numbers and production location.

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produced in America. **(Table 1)** Several other companies had produced fighters in the 1930s, notably Boeing in Washington State and, to a far lesser extent, Consolidated in California. But, as the decade ended, these companies chose to produce large bombers, aircraft which more closely fit the War Department's concept for hemispheric defense.[9] In fact, much of New York State's fighter production in 1939-1941 came from Dutch, Chinese, and French contracts rather than from the army or navy.[10]

Russian expatriate Alexander de Seversky founded the Seversky Aircraft Corporation in Farmingdale, New York in 1931.[11] The company produced the P–35 but lost so much money that it was reorganized as Republic Aviation Corporation in September 1939. Republic produced the P–35's successor, the P–43 Lancer, most of which were exported to China. However, it was the development of the magnificent P–47 Thunderbolt in 1941 that catapulted Republic into the first tier of American fighter manufacturers. In 1942, it became obvious that the Farmingdale plant could not produce the numbers of P–47s the USAAF wanted, so Republic opened a new plant in Evansville, Indiana and even contracted with Curtiss to produce 350 Thunderbolts in Buffalo. After the war, Republic produced many successful fighter jets for the new U.S. Air Force, including the F–4 and the F–105, but in 1960 design work

Produced in Other States

Type	1939	1940	1941	1942	1943	1944	1945	Name/Total
Eastern FM–1/F4F	0	0	0	23	1437	3130	1337	Wildcat
Goodyear FG–1/F4U	0	0	0	0	0	2108	1532	Corsair
Lockheed P–38	0	1	207	1479	2497	4187	1669	Lightning
North American P–51[8]	0	0	138	638	1710	6982	6103	Mustang
Republic P–47[9]	0	0	0	10	1131	3087	2014	Thunderbolt
Vought F4U	0	0	1	178	1785	2665	2046	Corsair
Vultee P–66	0	0	39	105	0	0	0	Vanguard
Total	**0**	**1**	**385**	**2433**	**8704**	**22159**	**14701**	**48383**

1. Curtiss produced 180 P–36 variants between April 1938 and June 1939. The author apportioned 90 to each year and added these to the H–75 variants
2. Early P–40 models were named the Tomahawk and the Kittyhawk.
3. The twin-engine F7F was too large for the navy's *Essex* class aircraft carriers and never flew in combat in the war.
4. Navy F8F squadrons were working up on V–J Day and never flew in combat in the war.
5. The Seversky Aircraft Corporation was reorganized as Republic Aviation Corporation on October 13, 1939.* P–35s are referred to interchangeably as Seversky or Republic P–35s.
6. Republic produced 80 P–43s between the fall 1941 and spring 1942. The author apportioned 40 to each year.
7. All P–47Gs (the CU variant) were built under contract by Curtiss in Buffalo, NY.
8. 500 Mustangs were produced as A–36 dive bombers in 1942 and 1943.
9. These P–47s were built in Republic's plant in Evansville, Indiana and designated as RA variants (Republic designated Farmingdale, LI production as RE variants). It appears no P–47 RA variants were sent to England before the summer 1944.**

Sources: Jean Cuny and Gérard Beauchamp, *Curtiss Hawk 75*, (Clichy: Éditions Larivière 1985), 287–8; Francis H. Dean, *America's Hundred-Thousand, U.S. Fighter Production Fighters of World War Two*, (Atglen, PA: Schiffer Military Aviation History, 1997), *passim*; William Green, *Warplanes of the Second World War, Fighters, Volume Four*, (Garden City, NY: Doubleday & Company, Inc., 1961), *passim*, Office of Statistical Control, *Army Air Forces Statistical Digest (World War II)*, (Washington, DC: HQS, US Army Air Force, 1945).

lagged and Fairchild Hiller purchased the company in 1965. In the 1970s, Fairchild-Republic developed and built the famous A–10 Thunderbolt II in its Farmingdale plant, which closed in 1987.[12]

Leroy Grumman founded the Grumman Aircraft Company in 1931 in a small factory in Baldwin, New York. Grumman's company specialized in building fighters for the navy as well as building military and civilian amphibians.[13] As business grew Grumman moved to a larger facility in Bethpage, New York in 1936. Production of Grumman's last biplane fighter, the F3F, ended in 1939 and production shifted to producing the famous F4F Wildcat in 1940, which remained the navy's premier fighter until it was superseded by the F6F Hellcat. Wildcat production in New York ceased in 1943 to produce the newer more capable Hellcat, but the navy continued to need the smaller Wildcat which could operate from the fleet's numerous small escort carriers. To keep Wildcat production going, Grumman contracted with General Motors to retool their dormant automobile factories in New Jersey as GM's Eastern Aircraft Corporation which produced almost 6,000 Wildcats between 1942 and 1945. Grumman also produced the famous TBF Avenger torpedo plane. Grumman became New York State's largest aircraft manufacturer and, had the war lasted, Grumman's newest fighter, the F8F Bearcat, was ready to join the fight in the summer of 1945. During the Cold War Grumman became Long Island's largest employer producing the F9F Cougar, the F11F Tiger and the famous F–14 Tomcat. But when the Cold War ended, Northrup bought the company out in 1994 to become the Northrup Grumman Corporation. The newly merged company then closed all its aircraft manufacturing facilities in Bethpage.

Long Island's third aircraft manufacturer was the Brewster Aeronautical Corporation founded by James Work in 1932. Brewster's main factory was in Long Island City (Queens), New York.[14] The Queens plant was an old six story automobile factory and "the only vertical aircraft plant in the world" which negatively affected production.[15] Brewster's aircraft were assembled at Roosevelt Field, Long Island. The company would later build wartime plants in Newark, New Jersey and Warminster, Pennsylvania. Brewster developed the SBN scout bomber, 30 of which were built in the Naval Aircraft Factory in Philadelphia, Pennsylvania starting in 1937. Brewster entered its portly F2A Buffalo monoplane in the navy's fighter com-

petition in 1938 and won a contract for 54 fighters. The Buffalo would also be produced for the Netherlands, Finland, and the RAF. During the war, Brewster was unable to develop a competitive follow-on fighter but produced almost 800 SB2A Buccaneer scout bombers for the navy as well as 645 F4U Corsairs for Chance Vought. The company was poorly managed and its aircraft suffered quality control issues compounded by delayed deliveries. Brewster was the only American aircraft manufacturer to go out of business during World War II.

Bell Aircraft Corporation was New York State's newest aircraft company located in Buffalo, New York. The company was cobbled together in 1935 by businessman Larry Bell from the remnants of Consolidated Aircraft which had moved to San Diego.[16] Bell's team secured a USAAC contract in 1937 for the weird and unsuccessful YFM-1 heavy twin-engine Airacuda fighter and opened a plant in Wheatfield, New York, adjacent to the Niagara Falls Airport. The contract for 13 Airacudas kept Bell afloat long enough to enter its radical mid-engine P–39 Airacobra in the USAAC's 1938 fighter competition. The army was impressed with the P–39's potential and ordered it into production. The aircraft failed to live up to the USAAF's expectations and is considered the service's least effective fighter. Bell followed up the P–39 with the P–63 Kingcobra, which was also not very effective. Unhappy with Bell's fighters, the USAAF sent most of the P–39s and P–63s to the Soviet Union and France under the Lend-Lease program. Bell did produce America's first limited production jet fighter, the P–59 Airacomet, which also was a disappointment. Employment at the factory peaked in early 1944 at 28,325 but dropped precipitously to 5,326 in June 1945.[17] After the war, Bell produced aircraft components for other companies until it was purchased by Textron in 1960. As a Textron division Bell became known for its reliable helicopters including the UH-1 and the Jet Ranger but these are manufactured in Texas. The company remains an aerospace division today producing components.

The oldest New York State aircraft manufacturer was the Curtiss-Wright Corporation in Buffalo, New York. Curtiss-Wright grew out of a merger of Curtiss Aeroplane and Motor Company, founded in 1909, with the Wright Corporation and several other smaller companies in 1929.[18] The newly merged company produced aircraft and propellers in Buffalo and aircraft engines in Wright's Dayton, Ohio factory. Its aircraft were known as Curtiss aircraft. In the 1930s, the company's Curtiss Hawk biplanes were very successful. Curtiss produced the monoplane P–36 for the U.S. Army Air Corps (the USAAC, which became the USAAF in 1941), and its export version, the H–75 Hawk, for France, China, the Netherlands, Finland and several other countries as well as producing the CW–21 Demon lightweight fighter for the Netherlands. The mass-produced successor to the P–36, the famous P–40, was the mainstay of the USAAF until 1943. During the war, Curtiss also produced large numbers of C-46 Commando transports as well as SB2C Helldiver dive bombers, SC Seahawk and SO3C Seamew seaplanes, and O–52 Owl observation planes. After the war, Curtiss failed to make the transition to jet aircraft and its aircraft division in Buffalo went out of business in 1948.[19] However, the Curtiss-Wright Corporation remains in business today manufacturing electronic and communications equipment.[20]

Fighters built in New York State fought in every theater from the beginning to the end of World War II. The first combat for New York State's fighters came on September 8, 1939, between five French Air Force Curtiss H–75 Hawks and German Bf 109Es; France lost one and the Germans lost two.[21] By France's surrender on June 25, 1940, France lost another 66 Hawks of the 257 delivered from Buffalo.[22] Hawks would fly in action throughout the war under Chinese, Dutch, British, Finnish, and Vichy French colors and, on December 7, 1941, four USAAF P–36 Hawks got into the air over Hawaii and shot down two Japanese planes.[23] RAF Curtiss P–40 Tomahawks flew against the Germans and the Italians in North Africa and against the Vichy French in Syria in 1941. Notably, the American Volunteer Group (A.V.G.), known as the "Flying Tigers," flew its famous shark mouth Tomahawks over Japanese-held Thailand in October 1941. Thus, by Pearl Harbor, Curtiss fighter aircraft had already been at war for 27 months.

Holding the Line

The first six months of 1942 were a disaster for the USAAF but P–40s and a few Republic P–35s fought a valiant but hopeless battle against the Japanese in the Philippines. At the same time, Australian and British Brewster Buffalos unsuccessfully contested the Japanese in Malaya. These defeats were followed by the defeat of the Dutch flying obsolescent Curtiss CW–21 Demons and Brewster Buffalos, with the help of a few USAAF P–40s, over the Dutch East Indies. In March 1942, Bell fighters entered the war as its P–39 Airacobras were rushed to defend Port Moresby in New Guinea.[24]

US Marine Corps Grumman Wildcats went down in defeat over Wake Island in 1941 but the US Navy persevered with victories in the Coral Sea and at Midway in May and June 1942. These victories were made possible by a handful of navy Wildcats, which escorted bombers and protected the aircraft carriers. Marine Corps Brewster Buffalos were slaughtered over Midway Island but they were surprisingly very successful at the same time in the hands of Finnish pilots against the Soviets. In June 1942, the USAAF deployed small numbers of Lockheed P–38s to Alaska and Iceland.[25] Only in August 1942, did an Alaska-based P–38 shoot down a Japanese flying-boat while an Iceland-based P–38 shot down a German four-engine maritime bomber. For the record, in the first eight months of America's war, the only fighters engaging the enemy were produced in New York State.

In August 1942, Americans took the offensive and seized Guadalcanal in the Solomons. Grumman Wildcats solely provided air cover. After establishing an airfield, more US Marine Corps Wildcats and USAAF Bell P–39s flew in to keep the Japanese at bay for the rest of the year. In the same month, in the opposite hemisphere, America

invaded French Northwest Africa under the air cover of more than 200 carrier-based Wildcats. In a unique case, Grumman Wildcats fought Vichy French Curtiss Hawks in the brief campaign, during which the aircraft carrier, USS *Chenango*, carrying a deck load of 77 Curtiss P–40s, launched the land-based fighters which then landed at newly captured airfields.[26] Lockheed P–38s flew in later after the army captured additional airfields in Morocco. As the year ended, Republic's new P–47 Thunderbolts deployed to England.[27] In America's first difficult year of war, Bell, Curtiss, and Grumman fighters carried, almost exclusively, the heavy load of combat for the USAAF and the USN.

Air Superiority and the War

There is agreement among historians that the USAAF achieved air superiority over the skies of Germany by May 1944.[28] The author recognizes that achieving air superiority in the theaters of war, except for the Central Pacific, was always an allied effort. In the early days of the European and the Mediterranean campaigns, Britain's Royal Air Force (RAF) carried most of the air war, but by 1943, the Americans gradually assumed that role. And, other than in supplying the Soviet Air Force with lend-lease aircraft, American airmen played no part in securing air superiority over the Eastern Front. These contributions notwithstanding, the decisive theater in the air was over Germany (in the European Theater of Operations or ETO) and the principal enemy was the Luftwaffe, without whose defeat the liberation of Europe would have been impossible. This article will argue the USAAF, almost alone in 1943 and in the spring of 1944, won air superiority in the skies over Germany.

Similarly, the decisive theater of operations in the Pacific was the central Pacific Ocean Area (POA) where Japan's fleet of fast aircraft carriers had to be defeated before the war could be brought to the Japanese home islands. In the POA the USN alone delivered air superiority in June 1944 through the destruction of the Japanese naval air arm.[29] There were two secondary theaters which were not strategically vital to winning the war but which contributed to victory by bleeding German and Japanese strength away from the decisive theaters. These were the Mediterranean Theater of Operations (MTO), which comprised two parts: North Africa and Italy, and the Southwest Pacific Area (SWPA), comprising southeast Asia and the Philippines. In the MTO, the RAF was a significant partner in achieving air superiority as was the Royal Australian Air Force (RAAF) in the SWPA.

There is a large literature on the fighter doctrine and operations of the RAF and the Luftwaffe in World War II. There is no corresponding literature for the USAAF and the weight of the literature about the American air war reflects the doctrinal view of that service in the phrase, "the ascendancy of bombardment over pursuit."[30] It is the large and costly air campaigns over Germany waged by the B-17s and B-24s of the Eighth and Fifteenth Air Forces and the bombing of Japan conducted by the B-29s of the Twentieth Air Force that American memory and interest have focused on for the past 75 years.[31] A review of books about USAAF fighter operations in World War II reveals a focus on tactical air support rather than on long-range fighter escort operations. There is a small literature about USN fighter operations through 1942 but little thereafter.[32]

By 1941, the USAAF's doctrines were solidly fixed in daylight precision strategic bombing designed to cripple the enemy's ability to produce the tools of war. In 1942, the USAAF prioritized industrial targets but shifted to aircraft factories in the summer of 1943. Mid-way through 1944, the USAAF targeted oil production and transportation networks. The instrument required to conduct such operations was the four-engine self-defending heavy bomber, equipped with a dozen .50 caliber machineguns, which could reach industrial targets deep in the enemy homeland. The RAF subscribed to similar doctrines but turned to nighttime area bombing targeting city centers and suburbs when the exorbitant losses of daylight operations became apparent in 1940. The philosophy behind American air doctrine was based on the seductive reasoning that the massive casualties of First World War trench warfare could be avoided by destroying the enemy's ability to produce weapons before they could be brought into action.[33] The debate over air warfare theory during the interwar period raged at the then-Army Air Corps Tactical School at Maxwell Field, Alabama intellectually pitting a "bomber school" against a "fighter school."[34] The bomber advocates prevailed leading to doctrines of power projection based on the assumption that, according to the ideas of air theorists William "Billy" Mitchell and Giulio Douhet, the bomber would always get through.[35]

The emphasis on strategic bombing marginalized American fighter doctrine, and fighter production was limited to small numbers of short-range mid-altitude interceptors.[36] These single-seat fighters were then called pursuits, with corresponding nomenclature such as P–39, which specialized in the interception of enemy bombers rather than achieving air superiority over the battlespace. The USAAF continued to prioritize bombers over fighters throughout the war. In the late summer of 1941, planners projected the USAAF would need 44 bomb groups and 21 fighter groups to defeat the Germans in Europe.[37] Even in mid-1943, USAAF planners projected a total global air force of 66 bomb groups and only 21 fighter groups.[38] This would change under the realities of combat but the concept of air superiority gained through fighters remained out of mind for an air service dominated by bomber pilots.[39]

Control of the Air in Europe

The ending of the North African Campaign was a disaster for the German and Italian air forces which were driven from the African skies by April 1943.[40] Control of the air in North Africa was jointly achieved in combined USAAF-RAF air operations. The USAAF shipped 285 Bell P–39s, 668 Curtiss P–40s, 533 P–38s, 89 A–36s (the dive bomber model of the P–51), and six squadrons of British Spitfires (approximately 150 aircraft) to the theater.[41] In

the spring of 1943 approximately 320 of these aircraft were operational at any given time.[42] A review of Commonwealth squadrons indicates the RAF flew around 700 Spitfires, 165 Hurricanes, and 150 Curtiss P–40s in the last days of fighting in North Africa.[43] Subsequently, the Luftwaffe in Italy tumbled into air inferiority after the Salerno landings in September 1943.[44] The RAF and the USAAF jointly achieved clear air superiority in Italy with the Americans flying 258 Bell P–39 and 579 Curtiss P–40s along with 296 P–38s and 187 A–36s.[45] In both air campaigns the USAAF's New York State-produced P–39s and P–40s outnumbered its P–38s and A–36s.

Air superiority over Northwest Europe (France and Germany) took considerably longer to achieve because the main strength of the Luftwaffe was drawn there for home defense.[46] The United States Strategic Air Forces (USSTAF) conducted the American strategic air campaign with the Eighth Air Force in England and, after November 1, 1943, the Fifteenth Air Force in Italy.[47] American bombing operations began on August 12, 1942, when 12 Eighth Air Force B-17s, escorted only by RAF fighters, bombed targets in Rouen, France. The mission was unopposed and suffered no losses. The strategic air campaign itself began with the Eighth's first mission into Germany on January 27, 1943, against Wilhelmshaven which lost 5% of the bombers. At that time, there were 163 P–38s, 102 P–39s, and 120 P–47s on hand in England, of which the Bell P–39s were destined for transfer to North Africa and would shortly be replaced by newer fighters.[48]

The roots of the allied effort to wrest air superiority from the Germans began at the Casablanca Conference in January 1943. The conference is remembered today mostly for the Anglo-American commitment to fight until Germany's unconditional surrender but the combined chiefs of staff also agreed to launch a coordinated Combined Bomber Offensive designed to progressively destroy German industrial production, dislocate the German economy, and fatally weaken German civilian morale.[49] In the spring of 1943, divergent views of how this might be achieved appeared between the USAAF and the RAF, with the Americans conducting daylight precision attacks against German industrial targets and the British conducting nighttime area attacks against German cities. A targeting compromise arrived on June 10, 1943, in the form of the Pointblank Directive, which "prioritized the Luftwaffe for destruction over all other German targets as the intermediate objective leading to the D-Day invasion."[50] Effectively, this gave the USAAF a year with which to destroy the Luftwaffe and seize air superiority.

In June 1943, because of the unexpected and burgeoning commitment in Italy, the USAAF had only three legacy Bell P–39s, two Lockheed P–38s, and 341 Republic P–47s in England.[51] It was a terrible place from which to begin a campaign for air superiority. American B-17s and B-24s were averaging loss rates of 1.6 percent when escorted by fighters and 7 percent without.[52] The basic problem for the USAAF was the short operational range of its single engine fighters which were unable to escort the heavy bombers all the way to their targets.

To attack the targets demanded by the Pointblank Directive, USAAF heavy bombers would have to fly beyond the range of escorting fighters. To accomplish this the USAAF experimented with and procured external fuel tanks that could be dropped before engaging with enemy aircraft.[53] **(Table 2)** But insufficient fighter range was not the only problem. A larger problem was USAAF doctrine, which dictated that escorting fighters formed an umbrella over the bombers to ward off German fighters.[54] This put them in a defensive posture and burned more fuel because they had to fly at the same slow and, for high performance fighters, inefficient speed as the bombers. Moreover, a sizeable portion (37 percent in July 1943) of the USAAF's fighters were employed in unproductive fighter sweeps over Luftwaffe airfields in France.

The disastrous Schweinfurt-Regensburg missions of August 1943 were designed to destroy the production of

Table 2 Range of American Fighters

Month/Year	Type and configuration	Radius	Targets in Range
June 43	P–47	230 miles	Amsterdam
July 43	P–47 w/75 gal belly tank	340 miles	Aachen
August 43	P–47 w/108 gal belly tank	375 miles	Bremen
November 43	P–38 w/2 75 gal wing tanks	520 miles	Leipzig, Hannover
January 44	P–51	475 miles	Hamburg, Stuttgart
February 44	P–47 w/150 gal belly tank	425 miles	Coblenz, Ruhr
February 44	P–47 w/2 108 gal wing tanks	475 miles	Frankfurt
February 44	P–38 w/2 108 gal wing tanks	585 miles	Berlin, Munich
March 44	P–51 w/2 75 gal wing tanks	650 miles	Prague
March 44	P–51 w/2 108 gal wing tanks	850 miles	Vienna

Source: Richard G. Davis, *Carl A. Spaatz and the Air War in Europe*, (Washington, DC: Smithsonian Institution Press, 1992), Maps 9 and 10, 362-3.

Republic P–47 production line in Farmingdale, Long Island, New York. These are P–47D "Razorbacks" produced in 1943. Republic produced over 9,500 P–47D variants. *(Photo courtesy of the Cradle of Aviation Museum)*

ball bearings, which would theoretically bring the German war machine to a halt. Fighter escorts accompanied the bombers to the German-Belgian border, leaving the bombers with two more unescorted flying hours to their targets. The Eighth Air Force lost 60 out of 360 bombers (16 percent of the force). A second mission to Schweinfurt in October produced a loss rate of 20 percent (60 out of 291 B-17s). Losses of this magnitude staggered the USAAF and led to the replacement of the Eighth Air Force's top commanders.

The new commander of the Eighth Air Force, Major General James H. "Jimmy" Doolittle, immediately introduced new fighter tactics in January 1944 which "reversed the course of the air war."[55] Doolittle recognized that the Luftwaffe's fighters were their strength as well as their Achilles Heel and he ordered the VIII Fighter Command to take the offensive.[56] Instead of closely guarding the bombers the fighters were free to roam and hunt German fighters, effectively transforming their mission from a defensive to an offensive posture.[57] Doolittle also ended the unproductive fighter sweeps to put every available fighter in the air escorting the bombers. The new drop tanks gave them the extended range necessary to use Doolittle's offensive tactics. However, the new tactics more than aircraft range became the tipping point in the struggle for air superiority over Germany.[58]

No single fighter type accompanied the bombers for the entire length of the mission. Instead the VIII Fighter Command assigned zones to the fighter groups which flew in an overlapping relay system with P–47s flying shallow and medium-penetration legs. Thunderbolts of the 56th Fighter Group flew their first such mission on January 24, 1944.[59] P–38s flew the deeper-penetration legs (RAF Spitfires covered the almost unopposed preliminary and final legs over the English Channel).[60] The small number of available P–51s covered the distant final-penetration legs to targets deep in Germany.[61] Without the burden of the fighter sweeps, there were now enough American fighters, over 600 were available daily in January 1944, to cover the relay missions. Doolittle's relay system also authorized returning fighters to strafe and attack ground targets of opportunity on the return leg, especially Luftwaffe airfields. The air war in Europe entered the decisive phase.

The USSTAF conducted Operation *Argument* in February and March 1944, which was designed to destroy the German aviation industry's factories. This led to a maximum effort called Big Week by the Eighth and Fifteenth Air Forces, from England and Italy respectively, beginning on February 20th.[62] The actual bomb damage to German factories was disappointing, but the bombers themselves forced the Luftwaffe's fighter arm into the skies. In effect the heavy bombers became the bait that the American fighters escorting them needed to bring the German fighters into battle. During Big Week the USAAF lost 28 fighters while the Luftwaffe lost over 500 (although many of these were destroyed on the ground by USAAF fighters strafing Luftwaffe airfields on the return leg to England).[63]

In March 1944, there were 1,920 Republic P–47s, 707 P–38s, and 792 P–51s in England, and 368 Republic P–47s, 341 P–38s, and 197 A–36s in Italy.[64] The USAAF also flew 375 Bell P–39s and 298 Curtiss P–40s in Italy, which were obsolescent but still useful in a secondary theater of war.[65] Berlin was targeted by the Eighth Air Force in March which forced the Luftwaffe into a duel to the death.[66] The USAAF put up 730 heavy bombers and 801 fighters on the first mission to Berlin on March 6th.[67] The presence of single-seat American fighters over Berlin spelled the end of the Luftwaffe's employment of its heavily armed twin-engine day fighter force, which were deadly to bombers but which proved easy targets for American fighter pilots.[68] In April the Luftwaffe's twin-engine fighter groups (*Zerstörergruppen*) were withdrawn from combat against the Eighth Air Force and sent to airfields in Austria.[69] The removal of these fighters eliminated 20 percent of the Luftwaffe's day fighter strength over Germany.[70] In a post-war USAAF interview, General Josef Schmidt the former First Fighter Corps commander, identified April 1944 as the month "American supremacy over the Reich was consolidated."[71] By the end of April 1944, German losses in fighter pilots exceeded the supply and the Luftwaffe lost control of the air over Germany.[72] According to historian Steven Zaloga, Pointblank itself ended on April 1, 1944 when command of the Eighth Air Force transferred from the USSTAF to the Allied Expeditionary Air Force (AEAF) in preparation for D-Day.[73] However, subsequent heavy bombing operations against German oil production, transportation networks, and V-1 targets kept the Eighth Air Force mostly over Germany until D-Day thereby continuing the fighter campaign against the Luftwaffe.

At the beginning of May, the Luftwaffe fighter arm could no longer mount continuous effective opposition to the allied strategic bombing campaign nor did it retain the strength necessary to interfere with the impending invasion of Normandy.[74] As ordered by the Pointblank Directive, the USAAF achieved air superiority over Europe by D-Day.[75] It must be noted that the RAF's night bombing operations and the American daylight bombing campaign targeting German fighter factories, oil production, and air-

Grumman F4F-3 Wildcats ready to enter the production line in the Bethpage, Long Island, New York factory. *(Photo courtesy of the Cradle of Aviation Museum)*

fields had almost no practical effect on diminishing the strength of the Luftwaffe in early 1944. Historians agree that the attritional losses of German fighter pilots, especially its leaders and aces, in the spring of 1944 directly led to the loss of control of the air over Germany.[76] In April 1944 alone, the Luftwaffe lost 38 percent of its fighter pilots assigned to home defense.[77] Doolittle's tactics were costly but the United States could readily replace pilots, aircrew, and aircraft; Germany could not.[78] In June 1944, the Luftwaffe had aircraft, it had fuel, but it no longer could replace its fighter pilots.[79]

The American fighters that secured this victory were overwhelmingly New York State-produced Republic P–47s. During Big Week, for example, P–47s flew 3,041 sorties, P–38s flew 373 sorties, and P–51s flew 425 sorties.[80] According to aviation historian Richard G. Davis, between January and April 1944, P–47s flew more than 26,243 fighter escort missions over Germany while P–38s flew 5,065 and P–51s flew 7,003 missions.[81] The commanding general of the VIII Fighter Command, Major General William E. Kepner, remarked in May 1944, "If it can be said that the P38s struck the Luftwaffe at its vitals and the P51s are giving it the *coup de grace*, it was the Thunderbolt that broke its back."[82]

The finest long-range escort fighter of the war was the superb P–51 Mustang but the USAAF initially assigned all P–51s in England to the tactical Ninth Air Force, which had a close air support mission. However, as the long range capabilities of the P–51 became known, Lieutenant General Ira C. Eaker ordered the Ninth Air Force IX Fighter Command's P–51 fighter groups to escort Eighth Air Force heavy bombers.[83] Thirty-six IX Fighter Command P–51Bs flew their first escort mission for the Eighth Air Force on December 5, 1943.[84] The Eighth Air Force's VIII Fighter Command finally received P–51s and flew its first escort mission using Mustangs on February 12, 1944.[85] Belatedly, Eaker's replacement, Lieutenant General Carl A. Spaatz, ordered the transfer of the P–51 fighter groups to the Eighth Air Force in exchange for the transfer of the P–47 fighter groups to the Ninth Air Force in the spring of 1944.[86] The Fifteenth Air Force did not receive P–51s until late March 1944 and flew its first Mustang escort mission on April 16th.[87] The first P–51Ds, with its signature bubble canopy, reached the Eighth Air Force in May 1944.[88] Mustangs would play a dominant role in the subsequent destruction of the Luftwaffe but they were too few in number during the Pointblank operations to be decisive.

Control of the Air in the Pacific

The decisive theater in the Pacific was the central POA, commanded by Admiral Chester Nimitz, who relied on fast aircraft carrier task forces to push the front from Midway to Japan.[89] At the time of Pearl Harbor, the U.S.S. *Lexington* and *Saratoga* still carried Brewster F2A–3 Buffalos but these were replaced by Wildcats at the end of January 1942.[90] After this, the navy's aircraft carriers employed the F4F Wildcat exclusively during the early operations over the Coral Sea, Midway, and Guadalcanal in 1942 during conditions of air parity. This began to change when the first Grumman F6F Hellcats deployed on the U.S.S. *Essex* on January 16, 1943, engaging in combat over the Marcus islands in August.[91] Over the summer and fall of 1943, Hellcats replaced Wildcats entirely on the navy's

Table 3. Carrier-borne Fighter Aircraft in the Central Pacific Area

Battle	Date	Carriers[1]	Wildcats-Hellcats-Corsairs[2]		
Coral Sea	May 1942	2	42		
Midway	June 1942	3	79		
Santa Cruz	October 1942	2	70		
Gilberts	November 1943	11		346	
Saipan	June 1944	15		450	3
Leyte	October 1944	17		573	
Okinawa	April 1945	17		670	176

1. In addition to its fast large carriers, the USN had many smaller escort carriers (CVEs) in these operations which provided large numbers of Grumman fighters for air support and air cover for the assaulting ground forces. By operation these totals are:
   Gilberts: 8 CVEs, 48 Wildcats, 80 Hellcats
   Saipan: 7 CVEs, 98 Wildcats
   Leyte: 18 CVEs, 243 Wildcats, 61 Hellcats
   Okinawa: 14 CVEs, 247 Wildcats, 24 Hellcats
2. Except for a handful of night fighters, the USN did not deploy F4U Corsairs on its aircraft carriers until December 1944.

Sources: Samuel Elliot Morrison, *Coral Sea, Midway and Submarine Actions, May 1942-August 1942*, (Boston: Little, Brown and Company, 1962), 90-91, Samuel Elliot Morrison, *The Struggle for Guadalcanal, August 1942-February 1943*, (Boston: Little, Brown and Company, 1964), 204-205, Samuel Elliot Morrison, *Aleutians, Gilberts and Marshalls, June 1942-April 1944*, (Boston: Little, Brown and Company, 1961), Appendix 11, 338-341, Samuel Elliot Morrison, *New Guinea and the Marianas*, March 1944-August 1944, (Boston: Little, Brown and Company, 1961), Appendix 3, 412-415, Samuel Elliot Morrison, *Leyte, June 1944-January 1945*, (Boston: Little, Brown and Company, 1958), Appendix 1, 415-429, Samuel Elliot Morrison, *Victory in the Pacific 1945*, (Boston: Little, Brown and Company, 1960), Appendix 1, 371-388.

large carriers. During Operation *Galvanic* to seize the Gilbert Islands in November 1943, the navy's first-line large aircraft carriers deployed the new Hellcat exclusively; 345 F6Fs altogether on 11 aircraft carriers.[92] **(Table 3**)

At the beginning of the war the USN similarly viewed its fighters as primarily defensive to protect the fleet while dive bombers and torpedo planes attacked the enemy fleet. The range of the navy's SBD Dauntless dive bomber was 600 miles while the F4F Wildcat fighter's range was just over 400 miles. Moreover, at the time of Pearl Harbor, the USN's aircraft carrier air wings were composed of 18 fighters and 54 dive bombers and torpedo planes. This mismatch in doctrine, capabilities, and numbers produced an obvious dilemma for the navy's commanders when making decisions about the employment of its fighters. Throughout the war the USN remained fixed on tactical air operations although it quickly increased the number of aircraft assigned to its fighter squadrons as the war progressed. After the raid on Wake Island in early February 1942, Vice Admiral William Halsey and his aircraft carrier captains recommended that fighter squadrons be increased to 27 aircraft.[93] This was approved and went into effect in March on the navy's carriers. Instrumental to this was Grumman's new F4F-4, which had folding wings that greatly reduced the stowage footprint of the Wildcat.[94] The Battle of the Coral Sea, May 8, 1942, provided more lessons and the U.S.S. *Yorktown*'s air group commander, Lieutenant Oscar Pederson sketched out a proposal for a 36 aircraft fighter squadron.[95] The navy approved this after the Battle of Midway in early June and, in July 1942, the navy brought its fighter squadrons up to 36 Wildcats.[96] This provided each aircraft carrier air group with 36 fighters, 36 dive bombers, and 15 torpedo planes for the impending Guadalcanal operation.[97]

After the Battle of the Philippine Sea, the navy approved increasing carrier-borne fighter squadron strength to 54 aircraft on July 31, 1944.[98] This was accommodated by reducing the number of dive bombers from 36 to 24. On December 2, 1944, after years-long and controversial carrier qualifications, Admiral Ernest King ordered ten US Marine Corps F4U Corsair squadrons "to be given immediate carrier qualification and assigned temporarily assigned to the fast carriers."[99] When these squadrons were available in 1945, each carrier air group increased to 73 fighters organized in two squadrons, while dive bomber strength dropped to 15 matching the number of torpedo planes.[100] The 33 percent increase in fighters was due to the relentless *Kamikaze* attacks and also because the Japanese fleet was either sunk or confined to harbor by 1945 thereby reducing the need for dive bombers.

Much like the problems suffered by the Luftwaffe, the Japanese naval air arm suffered from the loss of its irreplaceable highly trained pilots.[101] The hemorrhage began at Midway and accelerated as more pilots and air crew were lost in the Guadalcanal campaign. After most of its

U.S. Army Air Force land-based Curtiss P–40Fs launching from the USS *Chenango* on November 10, 1942, during Operation Torch off the coast of Casablanca, Morocco. *(Photo courtesy of the U.S. Navy)*

fast carriers were damaged in the Battle of Santa Cruz in October 1942, the Japanese Navy began a counterproductive pattern of deploying naval aircraft to land bases where they were exposed to attritional combat. In November 1942, 105 Zero fighter aircraft and 37 Val dive bombers reinforced what Japan called the Rabaul fortress, on Papua, New Guinea for operations over the Solomn Islands.[102] Most were lost in the subsequent air battles over Guadalcanal.[103] In October 1943 the Japanese Navy deployed an additional 173 aircraft from the air groups of three fast carriers to the Rabaul fortress.[104] This reinforcement brought Nimitz's fast carriers to hit Rabaul from 5-13 November, wiping out 50 percent of the enemy's fighters and 90 percent of the bombers, sending the survivors back to Truk.[105] The Japanese lost so much of its remaining naval air arm that the fleet at Truk could not respond to the invasion of Tarawa.[106] The USAAF's Fifth Air Force completed the destruction of Japanese land-based air power on Rabaul in February 1944 using 111 heavy bombers and 252 medium and light bombers, reducing the fortress to impotence. The Fifth Air Force's December 1943 fighter strength composed 69 Bell P–39s, 39 Curtiss P–40s, 58 Grumman F6Fs, 31 P–38s, and 71 new F4U Corsairs.[107]

In February 1944, Nimitz's fast carriers struck the Japanese Navy's main fleet base at Truk destroying over 300 Japanese aircraft. These strikes further weakened Japan's naval air arm but over the summer the Japanese reconstituted its aircraft carrier fleet in time to fight one last "Battle of the Fast Carriers."[108] In June 1944, Nimitz launched Operation *Forager* to seize the island of Saipan. By then, Nimitz's fleet carried 450 Hellcats as well as 27 specialized Hellcat night fighters, three Corsair night fighters and 423 dive and torpedo bombers on 15 aircraft carriers.[109] Japan's remaining aircraft carriers: three fleet carriers and six smaller carriers, carrying some 473 aircraft, came out to contest the Americans. The Japanese had fewer planes but their planes had greater ranges than the Americans. During Operation *Forager* the fleets met on June 19-20, 1944, in what is known as the Battle of the Philippine Sea. It was a massacre and the Japanese lost so many aircraft U.S. Navy fighter pilots nicknamed the battle "the Marianas Turkey Shoot."[110] One source asserts 58 Hellcat pilots became aces during Operation *Forager*.[111] In the two-day battle the Japanese fleet lost 426 of 473 naval aircraft, three of nine aircraft carriers, 50 land-based aircraft, and 445 irreplaceable highly trained naval aviators.[112] The Japanese naval air force never recovered from these losses and lost control of the skies over the Central Pacific.[113]

With air superiority assured American fast carrier task forces ranged unopposed throughout the Pacific. Later in 1944, American fast carrier task forces stuck Japanese airfields on Okinawa, Formosa (Taiwan) and Leyte in the Philippines. American losses were heavy but over 500 Japanese aircraft went down between 10-20 October 1944.[114] These strikes prepared the way for the American invasion of the Philippines. In the final fleet action of the Pacific War is known as the Battle of Leyte Gulf, fought between October 23-26, 1944. Japan retained a significant aircraft carrier fleet: four fleet carriers and seven smaller carriers, which had room to carry almost 600 aircraft. However only 166 aircraft, piloted by untried and poorly trained aviators, were available.[115] Thus only five carriers were sent out and used as bait to lure the American fast carriers away from the Japanese main attack which was composed of battleships. One Japanese carrier and 29 aircraft survived. It was a sad ending for the once powerful Japanese naval air arm. These victories were also exclusively secured by Hellcats. It is easily argued that Grumman's F6F Hellcats achieved and maintained air superiority in the POA.[116]

Conclusion

Thus, by June 1944, The USAAF and USN achieved air superiority in the two decisive theaters of war. This was achieved, largely in the ETO and exclusively in the POA, by fighter aircraft produced in New York State. The war would last another year in Europe and another fifteen months in the Pacific, and many costly air battles lay ahead. Despite the cost, by 1945 in both Europe and the Pacific, the USAAF and USN achieved a state of "command of the air" called air supremacy, a condition in which the opposing air force is incapable of effective resistance.

Air superiority was considered essential to the success of the allied amphibious invasions of North Africa, Italy, France, and the islands of the Pacific in World War II. To achieve air superiority combatants needed single-seat fighters flying in daylight to destroy the enemy's air force. Night fighters, bombers, multi-seat fighters, and reconnaissance aircraft all played important roles in offensive and defensive aerial operations, but the war in the air was won by single-seat fighters. To be fair, the gunners of America's magnificent heavy bombers contributed mightily to the destruction of the Luftwaffe by shooting down thousands of

The Bell P–39D production line in the Wheatfield, New York factory. First flown in September 1940 the P–39 entered USAAF service in February 1941. *(Photo courtesy of the Cradle of Aviation Museum)*

German aircraft from August 1942 through May 1945.[117] Similarly, in the Pacific, the navy's magnificent anti-aircraft capability mounted on its ships shot down thousands of Japanese aircraft. But in these cases, bombers and ships executed defensive fires to bring down the enemy – single-seat fighters flying offensive missions were required to bring the fight to the enemy to defeat the German and Japanese air arms.

The known numbers of American single-seat fighters produced by state during World War II provides a base of information from which to assess the extent of New York State's contribution to winning the war in the air. New York State-produced fighters alone held the enemy at bay under conditions of air inferiority during the terrible first year after Pearl Harbor. In the aerial campaigns of 1943 through June 1944, New York State-produced fighters numerically dominated the struggle to achieve air superiority in the European and the Pacific Theaters of Operation. New York State companies built three fifths of all USAAF fighters employed in the Pointblank Directive operations to destroy the Luftwaffe. In the Central Pacific, New York State companies built 100 percent of the USN's fighters used to achieve air superiority. As a matter of record, fighters produced by New York State aircraft manufacturers substantially enabled American efforts to achieve air superiority in World War II, which was a requirement for launching the American and allied war-ending amphibious campaigns. ■

NOTES

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43. Denis Richards and Hilary St. G. Saunders, *Royal Air Force 1929-1945, Volume II The Fight Avails*, (London: HMSO, 1954), Appendix XII, Mediterranean Air Command, 10th July 1943, 391-398.
44. Hooten, *Eagle in Flames, The Fall of the Luftwaffe*, 232-3.
45. Davis, *Carl A. Spaatz and the Air War in Europe*, 620; Craven and Cate, *Europe: Torch to Pointblank, August 1942 to December 1943*, 569; Craven and Cate (eds.), *Europe: Argument to V-E Day*, 398.
46. Chris McNabb, *Order of Battle, German Luftwaffe in WW II*, (London: Amber Books, 2009), 147-154.
47. Kevin A. Mahoney, *Fifteenth Air Force against the Axis: Combat Missions over Europe in World War II*, (Lanham, MD: Scarecrow Press, 2013), 1-5.
48. Roger A. Freeman, *The Mighty Eighth War Manual*, (London: Cassell, 2001), 209.
49. Robin Neillands, *The Bomber War, The Allied Air Offensive Against Nazi Germany*, (New York: Barnes and Noble, 2001), 200-3.
50. L. Douglas Keeny, *The Pointblank Directive*, (Oxford, UK: Osprey Publishing, 2012), 73; Neillands, *The Bomber War,* 248-9.
51. Davis, *Carl A. Spaatz and the Air War in Europe*, Appendix 9, 622.
52. McFarland and Newton, *To Command the Sky*, 100.
53. Ibid,, 103-6 and Freeman, *56th Fighter Group*, 29-42.
54. Davis, *Carl A. Spaatz and the Air War in Europe*, 358-361.
55. Miller, *Masters of the Air*, 247; Steven Zaloga, *Operation Pointblank, Defeating the Luftwaffe*, (Oxford, UK: Osprey Publishing, 2011), 55; Davis, *Carl A. Spaatz and the Air War in Europe*, 358-367.
56. Miller, *Masters of the Air*, 247-249.
57. Davis, *Carl A. Spaatz and the Air War in Europe*, 358-361. This section contains commentary on the decisions of MG James H. Doolittle, a non-career officer, who deviated from USAAF escort doctrines (FM-1 and AAF FM 1-15), which career officers LTG Ira C. Eaker and MG Frank O'D Hunter previously employed.
58. James H. Doolittle, *I Could Never be so Lucky Again*, (New York: Bantam Books, 1991, 379-382.
59. McLaren, *Beware the Thunderbolt!*, 55.
60. Overy, *The Bombers and the Bombed*, 176.
61. Davis, *Carl A. Spaatz and the Air War in Europe*, 361. The best illustration of how the fighter groups overlapped in Doolittle's relay system is the map on page 60 titled "Escorting the

bombers: Mission 182" contained in Zaloga, *Operation Pointblank*, 76-78.
62. Mahoney, *Fifteenth Air Force against the Axis*, 54-56.
63. James Holland, *Big Week, The Biggest Air Battle of World War II*, (London: Transworld Publishers, 2018), 340.
64. Davis, *Carl A. Spaatz and the Air War in Europe*, Appendix 9, 624 and Appendix 10, 228. The Fifteenth Air Force flew the A–36 dive bomber but had no P–51s operational until early April 1944. Many of the P–38s were F–5 photo reconnaissance aircraft. Both the A–36 and F–5 were unsuited to long-range escort missions.
65. The P–39 and the P–40 were incapable of long-range escort missions but could certainly perform escort missions to the limit of their range in the preliminary legs.
66. Roger A. Freeman, *The Mighty Eighth (A History of the Units, Men and Machines of the US 8th Air Force)*, (London: Arms and Armour Press, 1989), 113-127.
67. Davis, *Carl A. Spaatz and the Air War in Europe*, 371.
68. Ibid., 372.
69. Christopher Shores, *Luftwaffe Fighter Units Europe 1942-45*, (Oxford: Osprey Publishing Ltd, 1979), 35.
70. McNabb, *Order of Battle, German Luftwaffe in WW II*, 151.
71. Donald Caldwell and Richard Muller, *The Luftwaffe over Germany, Defense of the Reich*, (London: Greenhill Books, 2007), 186-187.
72. Davis, *Carl A. Spaatz and the Air War in Europe*, 394; Hooton, *Eagle in Flames*, 269-270; Shores, *Luftwaffe Fighter Units Europe 1942-45*, 33-37.
73. Zaloga, *Operation Pointblank*, 76-78.
74. Davis, Carl A. Spaatz *and the Air War in Europe*, 394.
75. Murray, *Strategy for Defeat*, 317; McFarland and Newton, *To Command the Sky*, 239-248; Clodfelter, *Beneficial Bombing*, 159; Donald L. Caldwell, *JG 26, Top Guns of the Luftwaffe*, (New York: Ivy Books, 1991), 214-215; Alfred Goldberg, "General Carl A. Spaatz," Field Marshal Sir Michael Carver (ed.), *The War Lords, Military Commanders of the Twentieth Century*, (Boston: Little, Brown and Company, 1976), 570-571.
76. Dildy, *"Big Week" 1944*, 91-92; Hooton, *Eagle in Flames*, 265-270; McFarland and Newton, *To Command the Sky*, 211-213; Miller, *Masters of the Air*, 276; Copp, *Forged in Fire*, 461. Zaloga, *Operation Pointblank,* 85-89.
77. Donald Caldwell, *Day Fighters in Defence of the Reich, A War Diary, 1942-45*, (Barnsley, UK: Frontline Books, 2011, 248-249. Caldwell details the shockingly high monthly losses, by defensive mission, suffered by the Luftwaffe's day fighter arm.
78. O'Brien, *How the War was Won,* 325-332.
79. Craven and Cate (eds.), *Europe: Argument to V-E Day*, 58-64; Alfred Price, *The Last Year of the Luftwaffe, May 1944-May 1945*, (London: Arms and Armour Press, 1991), 11-16; Caldwell, *JG 26, Top Guns of the Luftwaffe*, 215-226.
80. Hooton, *Eagle in Flames*, 270.
81. Davis, *Carl A. Spaatz and the Air War in Europe*, Table 4, 364. Davis noted the April figures did not include hundreds of missions flown by Ninth Air Force P–47s.
82. Michael O'Leary (comp.), *VIII Fighter Command at War, 'The Long Reach,'* (Oxford, Osprey Publishing, 2000), 11. O'Leary complied and added to a 1944 Eighth Air Force study titled *The Long Reach*. General Kepner's quote comes from the "Period Preface."
83. Thomas Alexander Hughes, *Overlord, General Pete Quesada and the Triumph of Tactical Air Power in World War II*, (New York: The Free Press, 1995), 116-118.
84. Roger A. Freeman, Alan Crouchman and Vic Maslen, *Mighty Eighth War Diary*, (London: Jane's Publishing Company, Ltd., 1981), 148.
85. Freeman et. al., *Mighty Eighth War Diary*, 181.
86. Davis, *Carl A. Spaatz and the Air War in Europe*, 316-318.
87. Mahoney, *Fifteenth Air Force against the Axis*, 92-93.
88. Roger A. Freeman, *Mustang at War*, (Shepperton, UK: Ian Allan, 1974), 80.
89. The author believes that MacArthur's Southwest Pacific theater leading to the Philippines was a strategic dead end, while Nimitz's POA led to Saipan, Okinawa, and Iwo Jima enabling the strategic bombing of Japan which ended the war in the Pacific.
90. Lundstrom, *The First Team: Pacific Naval Air Combat from Pearl Harbor to Midway***,** 17, 103.
91. William Green, *Warplanes of the Second World War, Fighters, Volume Four*, (Garden City, NY: Doubleday & Company, Inc., 1961), 102-3.
92. Samuel Elliot Morrison, *Aleutians, Gilberts and Marshalls, June 1942-April 1944*, (Boston: Little, Brown and Company, 1961), Appendix 11, 338-341.
93. Lundstrom, *The First Team: Pacific Naval Air Combat from Pearl Harbor to Midway***,** 144.
94. Ibid., 380.
95. Ibid.
96. Ibid., 553.
97. Lundstrom, *The First Team and the Guadalcanal Campaign: Naval Fighter Combat from August to November 1942*, 15-17.
98. Reynolds, *The Fast Carriers*, 223.
99. Ibid., 289.
100.Samuel Elliot Morrison, *The Liberation of the Philippines, Luzon, Mindanao, the Visayas 1944-1945*, (Boston: Little, Brown and Company, 1959), 87, 317. These numbers refer to the large *Saratoga*, *Enterprise*, and *Essex* class fleet carriers. The smaller *Independence* class carriers had a complement of 24 fighters in 1944.
101.O'Brien, *How the War was Won,* 402-412.
102.Lundstrom, *The First Team and the Guadalcanal Campaign*, 471-473.
103.O'Brien, *How the War was Won,* 406-407.
104.Samuel Elliot Morrison, *Breaking the Bismarcks Barrier, 22 July 1942-1 May 1944*, (Boston: Little, Brown and Company, 1964), 286-287.
105.Ibid., 336.
106.Paul S. Dull, *A Battle History of the Imperial Japanese Navy (1941-1945)*, (Annapolis: Naval Institute Press, 1978), 305.
107.Ibid., 405-9.
108.Reynolds, *The Fast Carriers*, 259-259 and Mark Stille, *The Philippine Sea 1944, The last great carrier battle*, (Oxford, Osprey Publishing, 2017), 5-8.
109.Morrison, *New Guinea and the Marianas*, Appendix 3, 412-415. The fleet also carried 27 F6F-3N night fighters and three F4U-2 Corsair night fighters.
110.Barrett Tillman, *Carrier Battle in the Philippine Sea, The Marianas Turkey Shoot June 19-20, 1944*, (North Branch, MN: Phalanx Publishing Inc, 1994), 13-28. Tillman noted that the Hellcat and Corsair night fighters also performed daylight missions.
111.Tomasz Szlagor and Leszek A. Wieliczko, *Grumman F6F Hellcat, Vol. I*, (Lubin, PO: Kagero, 2015), 12.
112.Tillman, *Carrier Battle in the Philippine Sea*, 318-9.
113.Reynolds, *The Fast Carriers*, 215; Tagaya, "The Imperial Japanese Air Forces," Higham and Harris (eds.), *Why Air Forces Fail*, 193; O'Brien, *How the War was Won,* 377; Richard Overy, *Blood and Ruins, The Last Imperial War, 1931-1945*, (London: Allen Lane, 2021), 296-297.
114.Samuel Elliot Morrison, *Leyte, June 1944-January 1945*, (Boston: Little, Brown and Company, 1958), 94.
115.Ibid., 319.
116.For examples, see Barrett Tillman, *Hellcat Aces of World War 2,* (London: Osprey Publishing, 1997), 6-10, 20-32; Bill Coombes, "Hellcat: Development of a Legend," *The Dispatch*, Volume 23, Number 3, Fall, 1998, 1; and Green, *Warplanes of the Second World War, Fighters*, 105.
117.Davis, *Carl A. Spaatz and the Air War in Europe*, Appendix 26, 663.

J–20 Mighty Dragon: Asia's First Stealth Fighter in the Era of China's Military Rise. By Abraham Abrams. Warwick UK: Helion, 2024. Map. Illustrations. Photographs. Notes. Pp. 86. $29.95 paperback. ISBN: 978-1-804515-60-0

Abrams has studied Asian military affairs for many years. Along the way, he earned two master's degrees, with the most recent completed at King's College, London, where he focused on how China modernized its military in the post-Cold War world. The emergence of the formidable J–20 Mighty Dragon symbolizes China's progress.

Abrams has crammed an impressive amount of information into this compact volume, which kicks off Helion's new Technology & Warfare series. He provides context by reviewing Communist China's first air-to-air experience flying Soviet-built MiG–15s during the Korean War in the early 1950s. The Chinese remained dependent on Soviet technology for many years until its domestic aerospace industry matured. Toward the end of the 20th century, the Chinese relied on Soviet Su–27 Flanker variants.

As Russian aerospace development stagnated with the collapse of the Soviet Union and the end of the Cold War, China began developing its own fighter aircraft. Chengdu received the contract to develop the J–10, similar in class to the Air Force's F–15 and F–16 and the Navy's F/A-18. That experience enabled Chengdu to proceed with the J–20.

Abrams traces the J–20's development and eventual entry into service. The Chinese required half the time it took the United States to develop and deploy the F–35. Abrams repeatedly stresses the failure of the F–22 program, supposedly America's answer to air superiority.

The J–20 neatly fits China's goal to dominate the air space in the western Pacific. The aircraft has a combat radius of more than 1000 miles, advanced avionics, and the most potent air-to-air missiles in the world. Its stealth capability and wide range of sensors enable the J–20 to potentially clear the path for older attack aircraft to strike Taiwan, the Philippines, or US Navy carrier task forces.

Abrams emphasizes how the Chinese have developed airborne-early-warning-and-control aircraft to enhance the aircraft's capabilities. If information available in open sources is as accurate as Abrams seems to think it is, these aircraft are clearly superior to US equivalents.

Meanwhile, Abrams notes that the Pentagon realizes it must develop a sixth-generation fighter as soon as possible. Whether the United States has the means or will to achieve this remains to be seen. Abrams argues how the F–22 and F–35 have failed to meet expectations.

This book paints a very dark picture for American retention of air superiority in a conflict with China. Abrams cites US officials who acknowledge the J–20's prowess.

The format is similar to other Helion books. Tom Cooper's color side views will appeal to modelers. Abrams also includes extensive citations. The book is a must read for anyone concerned about how the Chinese have appeared to surpass the United States in technical development.

Steven D. Ellis, Lt Col, USAFR (Ret), docent, Museum of Flight, Seattle

Assam Trucking Company: Air Transport Command, Birth of AMC. By B.F. Bates. Princeton TX: Franklin Publishing, 2020. Tables. Photographs. Appendices. Bibliography. Notes. Index. Pp. 274. $18.99 paperback. ISBN: 978-1-952064-99-6

Bates, the daughter of an Air Transport Command (ATC) pilot who flew over "the Hump" (the Himalayas) between China and India, has spent many years researching the airlift operations that helped keep China in the war. She also spent 30 years preparing training manuals and other materials for aircrews and maintenance personnel associated with airlifters and tankers.

Using a topical approach, Bates provides a detailed picture of how air transport evolved in the China-Burma-India (CBI) theater of operations. After the Japanese advance into Burma cut overland routes between India and China, the Allies turned to airlift as the only alternative. As the most distant of all Allied theaters, the CBI usually ranked last when receiving personnel and equipment.

Officials in Washington totally misjudged the conditions under which they expected a modern "airline" to operate. Transport units lacked sufficient numbers of Douglas C–47s. Furthermore, the Himalayas posed perhaps the greatest challenge in the world for flyers. Farther south, the mountains presented a less formidable barrier, but that route allowed Japanese fighters to intercept the transports.

From late 1942 to Japan's capitulation in August 1945, ATC used a variety of aircraft. Besides the C–47, these included the Curtiss C–46; the Consolidated LB–30, C–87, and C–109 versions of the B–24; and, to a lesser extent, the Douglas C–54. Bates addresses the advantages and disadvantages of operating these aircraft in an austere environment.

Despite severe limitations, the air- and ground-crews persevered. More and bigger aircraft resulted in a steady increase in tons moved. The arrival of Brig Gen William Tunner in 1944 as airlift commander significantly impacted the mission. Tunner, who would use lessons learned in the CBI to manage the Berlin Airlift in 1948-1949, emphasized efficiency, safety, and morale.

Bates devotes perhaps two thirds of the narrative to living conditions, environmental issues, and morale. She also covers the creation of the Air Rescue Service, initially just two C–47 crews who searched the mountains and jungle for downed aircraft and flyers. CBI officials introduced

survival training in the jungle as well as specialized equipment and procedures, including the "pointee-talkee" visual language guide to assist crews in communicating with indigenous people who could help them escape and evade the enemy.

This book reflects a serious research effort, but it has a couple of deficiencies—notably the absence of maps and a very choppy narrative. Despite these, *Assam Trucking Company* provides a sound foundation for readers wishing to learn about flying "the Hump." It is probably best suited for descendants of servicemen who served in the CBI.

Steven D. Ellis, Lt Col, USAF (Ret), docent, Museum of Flight, Seattle

Spitfire Heaven, Hurricane Hell: Malta's Battle for Survival in WW2 By Those Who Were There. By Martin W. Bowman. Air World. 2025. Photographs. Index. Appendix. Bibliography. Pp. 250. $54.95. ISBN: 978-1-3990 3339-8

This is a readable and anecdote-rich account of the Royal Air Force's defense of Malta, told from the cockpit and in the voices of the pilots themselves. The book's comfortable font and spacing enhance its accessibility, while Bowman's straightforward narrative style makes for an easy read. The firsthand accounts are filled with RAF vernacular and idioms. At times, the steady stream of period slang and pilot jargon begins to border on repetitive, but it certainly adds authenticity for readers attuned to the tone of wartime Britain.

Bowman's frequent inclusion of biographical sketches adds a humanizing texture to the narrative. These vignettes give the pilots emotional weight beyond their combat roles. However, they do occupy space that could have been used to situate Malta's strategic significance more clearly for unfamiliar readers. For a book centered on such a pivotal theater, broader historical framing would have helped underscore the stakes.

The book invites comparison with other desperate air campaigns of World War II—most notably the Cactus Air Force's defense of Guadalcanal. Both were isolated Allied outposts under siege that relied heavily on a mix of underresourced pilots and worn-out aircraft to deny air superiority to aggressive Axis forces. Large numbers of agile Japanese Zeros focused on long-range raids and attritional air dominance. The Germans, however, sent experienced Bf 109 pilots in tightly coordinated, high-tempo operations that sought to cut Malta's supply lines and eliminate its airfields. Tough and survivable Wildcats were outperformed by the Zero in speed and maneuverability, just as the early Hurricanes on Malta were outclassed by the Bf 109 in every technical metric. Later, the Spitfire Vb was more evenly matched with the Bf 109 and tipped the balance. But its limited range and fragility complicated its status as "savior" of Malta. It was an improvement, not a panacea.

Despite its narrative strengths, the book suffers from lapses in editorial oversight. Entire sentences are occasionally misplaced; and the conclusion is frustratingly abrupt, ending without drawing connections to larger operations such as *Torch* or the eventual Axis collapse in North Africa. The reader gets no clear sense of how Malta's survival contributed to the broader Allied campaign in the Mediterranean.

One question Bowman leaves tantalizingly unexplored is strategic: Why didn't the Allies attempt earlier strikes on Axis bases in Sicily, Pantelleria, or coastal North Africa to relieve pressure on Malta? Such operations may have been beyond Allied capabilities at the time, but the lack of analysis or discussion on this strategic point feels like a missed opportunity in a book otherwise filled with tactical-level detail.

Bowman also presents the launching of Spitfires from aircraft carriers—a critical element of Malta resupply efforts—as relatively routine, suggesting that this technique, while daring, had become standard practice. If true, it challenges the popular perception of these operations as extraordinary feats.

Spitfire Heaven, Hurricane Hell is best suited for readers who enjoy detailed personal recollections and the immersive language of pilot memoirs. Those looking for a more analytical or strategic treatment of the Malta campaign may find the book lacking in scope. Still, for fans of firsthand war stories and atmospheric reconstructions of aerial combat, Bowman delivers an engaging—if narrowly focused—account of a very grueling air war.

Gary Connor, recipient of Malta Armed Forces Commendation Medal, and docent, National Packard Museum, Cortland OH

Floatplanes over the Desert: The Adventures of French & British Naval Airmen Over Sea & Desert Sand, 1914–1918. By Ian M. Burns. Little Gully Publishing, 2025. Maps. Notes. Photographs. Appendices. Bibliography. Index. Pp. 552. $40.00 paperback. ISBN: 978-1-7636268-4-3

This unique, comprehensive study is the most archivally grounded treatment yet of Anglo-French naval aviation in the Eastern Mediterranean and Middle East during World War I. Earlier scholarship relegated these operations to the margins. Burns demonstrates their importance across a vast theater. In some sectors, such as the Sinai and Gaza fronts, floatplane reconnaissance and rail interdiction exerted direct operational influence, safeguarding the Suez Canal and shaping the tempo of the Palestine

campaigns. Raids on Alexandretta and the Castellorizo operations also showed tangible effect in disrupting Ottoman communications; while sorties in the wider Aegean and Anatolia, though more demonstrative than decisive, revealed the reach of Anglo-French air-sea power.

The book traces the evolution from the embryonic *Aéronautique maritime* detachment at Port Said and Samson's early Royal Naval Air Service deployment through to the RAF's transition in 1918. Burns interlaces the operational record with attention to matériel, tactics, and personalities. What emerges is not merely a sequence of events but a narrative in which adaptation, coalition, and improvisation recur as defining themes. The Anglo-French dimension is particularly well handled, with French and British records set alongside one another in a way that gives the study uncommon balance. Chronology serves as a framework rather than a stricture, allowing episodes—from the fragile beginnings at Port Said through later rail interdictions and coastal raids—to accumulate meaning, revealing patterns of endurance and innovation. The clear narrative offers not only what happened, but why these operations mattered.

One of the most striking features of the book is its carefully prepared maps. These actively guide the reader through the shifting geography of the area. By clarifying the relationship between sea bases, inland targets, and the larger campaigns, the maps transform the volume into an operational atlas, invaluable for following the arc of events.

No less remarkable is the range of visual material. Over 400 photographs drawn from family collections, institutional archives, and contemporary sources provide a vivid record of machines, crews, and bases. The provenance and condition notes alongside each image are exemplary.

The supporting material is outstanding. Appendices stand as research contributions in their own right, addressing topics such as personnel rosters, serial listings, shipboard operations, and comparative ranks. Together, they offer resource-filled, research-rich material that can be consulted independently of the main text. The unusually large bibliography spans British, French, German, and Ottoman sources. Its depth underscores a key truth: that naval aviation in this theatre cannot be fully understood within a single national framework, but only through the convergence of diverse traditions and perspectives. Finally, the notes and index ensure the volume's value as both a reference tool and compendium for scholars and as a work of narrative history.

This work is the obvious product of extensive research. It restores to the historical record a campaign long overshadowed, and demonstrates how naval aviation, operating fragile floatplanes, projected force across seas and deserts with strategic consequence. For historians of World War I aviation and Middle Eastern operations alike, it's a major contribution.

Carl J. Bobrow, Quondam Alfred Verville Fellow, National Air and Space Museum

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Cold War Test Pilot. By Ron Burrows. Barnsley UK: Pen & Sword Books, 2024. Illustrations. Photographs. Bibliography. Index. Pp. 299. $29.95 paperback. ISBN: 978-1-1-39909-074-2

I've reviewed dozens of books for this journal, and Burrows' *Cold War Test Pilot* stands out as the most enjoyable, best-written of them all. His first assignment was to a squadron in the Aden Protectorate during the final days of that British deployment. Then, as now, the Middle East was a complex, confusing environment. But Burrows' succinct description of the political and military situation painted a clear picture of the world in which he flew. In another passage, he addressed the experience of being a passenger in a tail-dragger that went through a ground loop; his explanation of the forces affecting the airplane was technically accurate and was written in terms even a nonpilot could understand and visualize.

In the early 1970s, Burrows began a career arc that included four assignments at Boscombe Down, the home of the Empire Test Pilot School (ETPS). He entered the field just as British military aviation was undergoing major changes. Britain's aviation development community had tried to keep pace with the USA and the USSR but was realizing that it did not have the economic resources to sustain this. Thus, test piloting was given a more near-term focus. Test flying organizations devoted more resources to acceptance trials for aircraft about to go into operational service, rather than to development projects that looked further into the future.

This near-term focus was heightened in April 1982 when Argentina invaded the Falkland Islands. The British response included the deployment of dozens of Harriers and Sea Harriers by the RAF and Royal Navy, which intended to use these aircraft in ways that had not previously been certified. The urgent mission came to Burrows, now in command of the Fighter Test Squadron at ETPS, to certify the aircraft to carry additional stores in new configurations, to operate from two different "ski-jump" ramps on British aircraft carriers, and to conduct in-flight refueling with C–130 tankers.

As squadron commander, Burrows should have been in an oversight role for this certification project. But the significant number of configuration tests that had to be accomplished in a limited amount of time, plus a shortage of Harrier pilots, required him to do a lot of the test flying himself. Fortunately, when preparing for command, he had undergone qualification training in the Harrier, the airplane that became his all-time favorite type. The squadron completed the testing and provided the results to the deployed forces in a timely manner and enabled the fighting force to employ the Harriers as intended.

After an assignment in the Ministry of Defence in London, in 1985 Burrows returned to Boscombe Down as superintendent of the airfield, base operations, and the flying organization. With qualified leaders in his subordinate or-

ganizations, he recognized that his flying days were behind him. After three successful years, during which he developed and implemented significant management improvements to the organization, he retired from the RAF in 1988 and moved on to the next phase of his life.

Burrows had an exceptionally successful career, and I thoroughly enjoyed reading his story. If you're even remotely interested in the subject of test piloting—actually, even if you're not but just appreciate reading well-written books about aviation—*Cold War Test Pilot* belongs in your library.

LTC Joseph Romito, USA (Ret), Docent, National Air and Space Museum

B–52 Stratofortress Units in Combat 1992-2025. By Peter E. Davies. Oxford UK: Osprey, 2025. Photographs. Illustrations. Appendices. Index. Pp. 96. $25.00 paperback. ISBN: 978-1-47286503-8

Davies' latest book continues Osprey's tradition of concise, authoritative, and beautifully illustrated aviation histories. While the Boeing B–52 began life as the very symbol of America's airborne nuclear deterrent—the aviation component of the nation's strategic triad—it has steadily evolved into one of the most versatile and enduring conventional strike platforms in military history.

Davies traces this evolution with clarity and insight, showing how the B–52's combat debut in Southeast Asia during Operations *Arc Light* and *Bullet Shot* revealed both its devastating power and its inherent limitations. What followed was decades of refinement, as engineers and crews alike adapted the "BUFF" to an ever-changing battlefield. Constant improvements to the aircraft's avionics and its seamless integration with successive generations of precision-guided munitions have created a warfighting system without peer in any other air force.

Using Osprey's proven formula of operational overview, meticulous research, and striking artwork, Davies offers a concise yet complete account of the B–52's modern-era campaigns—from the Gulf War to operations over Afghanistan, Iraq, and Syria. His chapter on modern weapons is particularly well crafted, giving the armchair historian an accessible yet technically grounded update on the BUFF's present-day arsenal and employment.

Davies also highlights the human side of this transformation. Just as the aircraft has evolved, so too have its crews, whose skills have grown to match the complex systems they now command. Early conventional bombing efforts were hampered by limited radar accuracy and the smaller destructive radius of non-nuclear ordnance. But as the B–52 gained advanced phased-array radar, inertial navigation, and GPS-guided weapons, it became capable of delivering pinpoint strikes even in densely populated urban theaters—while still retaining its unmatched capacity for area bombardment when required.

Importantly, Davies situates the B–52 within the larger American bomber triad, showing how the BUFF, B–1, and B–2 complement one another—each compensating for the others' limitations. He also underscores how improved communications and command systems have effectively turned the venerable Stratofortress into the world's largest close-air-support platform.

As expected from Osprey, the production values are high: sharp photos, first-rate research, and vivid artwork. Eleven pages of profile drawings may verge on excess, but modelers will be delighted. Overall, this is another excellent entry from Davies—highly recommended to aviation historians and any former SAC "Crew Dog" eager to reconnect with an old friend in uniformed aluminum.

Gary Connor, docent, National Packard Museum, Cortland OH

Aeromasters: Celebrating a Century of the American Fighter Pilot. By Dino Garner and Liz Fetter. Bozeman MT: AER Publishing Group, 2025. Illustrations. Photographs. Pp. 250. $89.00. ISBN: 979-8-218-48677-8

This book is an illustrated compilation of profiles of eminent aviators from the dawn of flight to the present day. The theme is to honor renowned American military aviators. The authors are experienced writers and illustrators with many titles to their credit.

One-page biographical sketches explain the significance of the subject's place in history. Each includes the subject's number of victories, dates of birth and death, and unit. Each entry is accompanied by inset pictures of the subject, decorations, and wings. Some of the essays are original; others are quotes from previous publications. For instance, the essay on Richard Bong is an excerpt from General Kenney's biography. A few, such as that for General Charles Q. Brown, are expressed as poems. Vivid, full-color original art of the aviator and the aircraft in action accompany each entry. These action-packed illustrations, many of which are by Garner himself, give the essays impact and immediacy.

The book is arranged in chapters from pre-World War I to the present. For example, Frank Luke and Eddie Rickenbacker appear in the chapter on World War I; Don Gentile and Donald Blakeslee in World War II; Louis Sebille in Korea. The subjects are primarily USAAF/USAF, with a few USN and USMC, but there are also profiles for WASPS and the Flying Tigers. Entries are not confined to the American military. For example, Flying Tiger Squadron Leader Robert H. Neale did not join the USAAF when the Tigers disbanded in July 1942.

The title notwithstanding, the subjects include several aviators eminent for reasons beyond flying fighters. Gen-

erals Arnold, Andrews, and Mitchell fit into this category. Pararescuemen Wayne Fisk and Duane D. Hackney are also included. Glenn Curtiss appears as a founding father of American aviation. There is even a fictional entry: Lt. Bill Bruce, of General Hap Arnold's books, is included as influential in helping spread knowledge of aviation to American youth. In some cases, the coverage is of an eminent unit such as the Tuskegee Airmen; Lafayette Escadrille; or Aztec Eagles (Squadron 201), Mexican Expeditionary Air Force. An essay appears on Walt Disney studios, the source of many squadron logos and training and morale films.

This book is a 12" x 12" hardcover printed on heavy, acid-free card stock. It comes in a sturdy slipcase. The book's physical properties and presentation deliver the message that it is a permanent artifact, meant to memorialize its subjects in perpetuity. One nice touch is inclusion of a number of bookmarks printed on heavy card stock that read "remove before flight."

The table of contents does not include the aviators, and there is no index. I listed them on a separate sheet of paper and tucked it under the front cover so I can find my favorites. There is no bibliography, although images of a few book covers appear in the individual entries.

Although some may find the purchase price steep, this book is highly recommended and would make a great gift for someone interested in military aviation.

Steven Agoratus, Hamilton NJ

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They Also Serve: RAF Reconnaissance and Support Projects since 1945. By Chris Gibson. Manchester UK: Hikoki Publications, 2024. Maps. Tables. Diagrams. Illustrations. Photographs. Appendices. Glossary. Index. Pp. 336. $49.95. ISBN: 978-1-80035-308-4

For nearly 30 years, Gibson worked in the oil-exploration industry all over the world. He also volunteered in the Royal Observer Corps in the 1980s before the government deactivated that organization in 1991. With his interest in aircraft, he focused on post-World War II developments. Three of his previous books covered British guided weapons, long-range bombers and weapons, and airlift.

In this book, Gibson has assembled an immense amount of information in a comprehensive overview of Royal Air Force (RAF) missions excluding those requiring bombs, bullets, or missiles. Slightly less than half the book covers reconnaissance. He divides the remainder among airborne early warning, VIP transport, aerial refueling, air-sea rescue, and medical evacuation. Gibson includes the use of surveillance balloons and electronic-intelligence collection as appendices.

Each chapter features numerous photographs and line drawings of aircraft, or platforms, and systems. He devotes considerable space to "paper airplanes"—projects that received serious consideration at some point, but typically failed to materialize either because of technical challenges or budgetary constraints. While the book's scope emphasizes post-World War II developments, Gibson includes earlier RAF experiences when relevant.

Gibson breaks down the reconnaissance mission into five chapters: tactical, strategic, radar, weather, and nuclear. Sometimes the missions overlap, resulting in occasional redundancy. He also points out where technological progress has led the RAF to de-emphasize some collection types.

The British pioneered practical aerial refueling. In the first of two chapters, Gibson provides a detailed look at that legacy. In the second chapter, however, he examines how the government chose to outsource aerial refueling. Freddie Laker, an unconventional airline entrepreneur, lobbied for the contract. Eventually, Flight Refuelling Ltd received it.

Gibson discusses rotary-wing air-sea-rescue and medical-evacuation operations in the final two chapters. Perhaps, because of his earlier book, he approaches airlift tangentially. Boeing C–17s and BAE VC–10s pop up in various chapters.

Besides aircraft, Gibson examines relevant systems. Unsurprisingly, he includes references to many American post-war innovations. Numerous times Gibson points out how the RAF either relied directly on US technology or used it as the foundation for domestic programs.

With so much information at the fingertips, the reader probably will find this volume most useful for reference rather than a casual read. Despite the first-class publication qualities, the book's narrative is a bit disjointed. Thorough editing might have made a difference.

Steven D, Ellis, Lt Col, USAFR (Ret), docent, Museum of Flight, Seattle

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Neil Armstrong at USC and on the Moon: Apollo 11 Lunar Landing. By Mike Gruntman. Los Angeles CA: Interstellar Trail Press, 2025. Photographs. Illustrations. Notes. Appendices. Bibliography. Index. Pp. xii, 174. $19.95. ISBN 979-8-98566877-3

It has been two decades since Simon and Schuster released Auburn University aerospace-history professor James Hansen's nearly 800-page, prize-winning *First Man: The Life of Neil A. Armstrong*, the only authorized biography of the first human to set foot on the Moon. While readers might legitimately question whether University of Southern California (USC) astronautics professor Mike Gruntman's recently published, relatively slender book offers anything new, they should not ignore it.

Gruntman provides engaging details about Armstrong's often overlooked academic connection with USC, both before and after his lunar flight. He explains how Armstrong came to the National Advisory Committee for Aeronautics (NACA) High Speed Flight Station at Ed-

wards AFB as a test pilot in 1955 and "took advantage of an opportunity to start graduate studies part-time at the USC School of Engineering," which offered courses at several off-campus locations, including Edwards. By the end of the Spring 1959 semester, Armstrong had completed all required coursework for a Master of Science degree. Only research and writing of a thesis remained, but professional and personal circumstances kept him from completing that requirement before he transferred to NASA-Houston in 1962.

On January 22, 1970, however, after having spent more than seven years as an astronaut in NASA's Gemini and Apollo programs, Armstrong returned to the main USC campus, where he delivered a one-hour Master's Seminar titled "Apollo 11 Lunar Landing Mission, Lunar Landing Techniques." In a ceremony immediately following the seminar, USC Provost John Hubbard and Dean of Engineering Zohrab Kaprielian presented Armstrong with his master's degree diploma, which the recipient remarked was "an earned degree," not merely honorary. He would receive an honorary doctorate from USC in 2005.

Between chapters about Armstrong's USC–related activities during the 1950s and in 1970, Gruntman inserts five skillfully narrated, technically detailed chapters that provide an overview of the Apollo program, development of the Command and Lunar Modules, training for lunar landing, and the actual Apollo 11 descent to the lunar surface on July 20, 1969. Frequent quotations help readers understand how participants viewed all these events. Numerous photographs and other illustrations further complement Gruntman's telling of the story.

Neil Armstrong at USC and on the Moon reflects the author's mastery of the historical research needed to craft an engaging, tightly woven story. Gruntman's source citations reflect diligent pursuit of primary documentation from USC Libraries and Special Collections and other institutions across the United States, such as Purdue University and the Reagan Presidential Library, to enrich his final product. The same can be said for his discriminating use of secondary source material from scholarly books and periodicals cited in his footnotes. Nowhere else does his quest for sources become clearer than when Gruntman explains his quest for the meager audio and film records from Armstrong's January 1970 visit to USC.

Anyone interested in Armstrong's life or the Apollo program would be hard pressed to find a more suitable, intellectually easy-to-digest volume than this one. It can inspire budding aerospace engineers, seasoned space professionals, curious history buffs, scholarly academicians, and countless others. Also, given the price of books today, this one seems modestly affordable.

Dr. Rick W. Sturdevant, Director of History, HQ Space Training and Readiness Command

Into the Inferno: The Story of a B–17 Gunner over Nazi-Occupied Europe. By Bill Ibelle. Philadelphia PA: Casemate Publishers, 2025. Photographs. Diagrams. Pp. 183. $32.95. ISBN: 978-1-63624-558-4

This is a biography of a World War II aerial gunner, Bert Ibelle, who flew combat in B–17s from December 1944 to VE day. Ibelle, of Hartford, Connecticut, completed 24 missions before the war ended, became a clinical psychologist postwar, married, and raised two children. It is written by his son, a journalist who has brought his research, interview, and analysis skills to this work.

Above all this is a combat memoir. Those wanting day-to-day details of a crewman on Fifteenth AF heavy bomber operations will find them here. Drafted in April 1943, Bert Ibelle was in training until shipping out in November 1944 with a replacement bomber crew ferrying a new B–17 to Italy. Assigned to the 483 BG at Sterparone, Italy, Ibelle and his crew lived in tents and battled cold, rain, and mud. They flew long-range, high-altitude, daylight-precision-bombing missions to various Axis industrial and oil targets in southern and eastern Europe. By 1945 the Allies had air superiority; but flak, Ibelle found, was the major problem. While describing the sound of flak fragments striking the aircraft, Ibelle noted that his plane came back damaged on every mission. The son gives us vivid details of flight crew procedures: painstakingly donning flak suits, staying on oxygen when at altitude, going into the bomb bay to arm bombs, flying in the ball turret, and struggling to survive a lengthy return flight when wounded. For those accustomed to stories such as the classic memoirs of Stiles (1952) and Bendiner (1980), written about the big aerial battles for air superiority of 1943, this book is a change. As with many wartime memoirs, the impact of war on friends and family is interwoven throughout, especially Ibelle's faithful correspondence with his future wife and the shock at the sudden combat death of his infantryman best friend.

The son, who came of age during the Vietnam era, remarked that researching the book enabled him to reconcile his own feelings about the death and destruction resulting from bombing with his father's role in the war. In this he has much in common with Tom Mathews, whose compilation *Our Fathers' War* (2005) revealed how he and many other children of combat veterans came to grips with their fathers' service.

The book depends heavily on letters, unpublished manuscripts, drawings, and diagrams from Ibelle and friends. Bill Ibelle quotes extensively from his father's combat diary, as well as from discussions they had from time to time about the war. Official sources and personal collections supplied photos of Ibelle and his crew, B–17s in combat, and friends and family. The review copy, unfortunately, had no notes, bibliography, or index, but the text does name a few sources. Two appendices list Ibelle's missions and provide a photo of Ibelle and his crew.

The book is written in a lively and approachable style appealing to the general reader. In pursuing his quest to

understand his father's service, the son has richly portrayed the life of a World War II bomber crewman. This book is highly recommended.

Steven Agoratus, Hamilton NJ

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VLR P–51Mustang vs Japanese Fighters: Japan 1945. By Carl Molesworth. Oxford UK: Osprey, 2025. Photographs. Bibliography. Illustrations. Index. Maps. Pp. 80. $23.00 paperback. ISBN: 978-1-4728-6640-0

This is Molesworth's second Osprey 80-page study on essentially the same operational story—the long-range Iwo Jima Mustang campaign against the air defenses of the Japanese Home Islands. Given the richness of the subject and the breadth of surviving documentation, the topic may have been better served by a single, more substantial volume that allowed deeper analysis, broader context, and more sustained technical and human discussion. The Osprey format is clean and efficient but constrains as much as it enables. Here, that limitation shows.

That said, this book has real merit. Molesworth excels in areas that too often receive cursory treatment. His explanation of the arcane Japanese Army and Navy aircraft-designation systems is unusually clear, helping readers sort out the bewildering mixture of Type numbers, Ki-series designations, and Navy alphabetical codes. Similarly strong is his concise chapter on Japanese early-warning systems, especially his account of the coastal picket ships stationed along the southern approaches to Honshu. These ad hoc naval radar posts were a critical, but frequently overlooked, link in Japan's air-defense chain. Molesworth's overview is one of the more readable introductions to the subject in an accessible format.

The graphic material is also impressive. Osprey's trademark annotated drawings—showing armament installations and comparative weapons fits on both the Mustang and its Japanese adversaries—are particularly helpful. Yet, even here, the limitations of the format show. The illustrations naturally raise the question: why did Japan persist with rifle-caliber machine guns long after every major air force had shifted to heavy machine guns and cannon? The answer involves industrial bottlenecks, metallurgy, powder chemistry, and doctrinal inertia, but Molesworth—following Osprey's tight structure—does not delve into it. This is precisely the sort of question a longer treatment could have addressed.

Where the book feels most compressed is in its handling of the human dimension of VLR operations. Molesworth includes pilot vignettes and dogfight accounts, but he fails to describe the truly extraordinary physical and psychological demands of the Iwo-Japan sorties. A typical VLR mission lasted seven to nine hours or more, once pre-flight delays were counted. Pilots often sat an additional hour in a sweltering glass greenhouse on the coral runways of Iwo Jima, where cockpit temperatures easily exceeded 100°F. Many were partly dehydrated before the wheels left the ground. They carried multiple one-quart canteens or makeshift containers to ration water throughout the flight—water that, inevitably, created its own urgent problem. The P–51 had no relief tube, forcing pilots to discreetly improvise solutions in the cramped cockpit. One can imagine the brutal discomfort of entering a high-G turning fight against Ki-84s or A6Ms with an overfull bladder—an unspoken but deeply human aspect of air combat.

Molesworth clearly understands the human dimension; he notes Japanese pilots flying with prosthetic limbs, hooks for hands, and the nearly legendary Sabur Sakai fighting while blind in one eye. But in an 80-page format, he cannot pursue these themes to the depth they deserve.

This is not a bad book—far from it. It is well written, intelligently organized, illustrated with care, and underpinned by sound research. But the story it tells is incomplete, hemmed in by the constraints of the series. I recommend it, but with the hope that someone will someday give this extraordinary campaign the fuller treatment it warrants.

Gary Connor, docent, National Packard Museum, Cortland OH

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Over Cold War Seas: NATO and Soviet Naval Aviation, 1949–89. By Michael Napier. Warwick UK: Osprey, 2025. Photographs. Appendix. Index. Bibliography. Pp. 320. $40.00. ISBN: 978-1-4728-6552-6

This book is a first-rate survey of maritime aviation during the Cold War, and it delivers on every front—visuals, organization, breadth, and insight.

One of the book's most striking features is its visual richness. Napier assembles an outstanding album of color and black-and-white photographs that are consistently sharp, evocative, and thoughtfully chosen. The images are accompanied by detailed captions that go beyond identifying aircraft or ships, providing technical context and operational background. The result is a curated visual archive that complements and deepens the narrative.

The book's chronological structure makes it easy to navigate what could otherwise be an overwhelming subject. Napier walks the reader decade by decade through the Cold War, and within each chapter, the internal organization follows a consistent pattern. This parallel arrangement makes comparisons across nations and time periods straightforward, highlighting both contrasts and continuities.

While US and Soviet naval aviation understandably takes center stage, other NATO and Warsaw Pact nations (Britain, France, Italy, Poland, et al.) are not overshadowed. Napier carefully outlines their roles and contributions to the maritime

order of battle. This balanced treatment underscores how the Cold War at sea was truly multinational in scope.

Napier also explains the technological dimension of maritime aviation, tracing innovations from angled flight decks and ski-jumps to sonar systems, radar suites, and anti-submarine warfare weapons. His clear, concise, and accessible explanations offer enough depth for specialists while being understandable to readers new to the subject.

Importantly, Napier makes clear—without belaboring the point—that not every nation could afford the extravagant costs of full-scale carrier aviation. Many air forces were forced to adapt land-based aircraft to maritime roles—sometimes awkwardly, sometimes ingeniously. This economic undercurrent adds a dose of realism to the story and helps explain the diversity of approaches pursued across the Cold War navies.

I was a disappointed to find no mention of the USAF B–52 in the maritime patrol role. In the 1970s, the Air Force tested its ability to patrol wide ocean areas and track surface fleets. While the bomber's long range and endurance were well suited to the task, it lacked the sensors and low-speed handling needed for anti-submarine warfare, limiting its effectiveness as a true patrol aircraft. The focus soon shifted to maritime strike. By the late 1970s, B–52s were fitted to carry the AGM-84 Harpoon anti-ship missile, giving them the ability to deliver large standoff salvos against Soviet surface groups. Though never a replacement for specialized patrol aircraft, the Harpoon-armed B–52 became a valuable Cold War asset—an adaptable, high-capacity platform that reinforced US and NATO sea-control strategy against the Soviet Navy.

In the end, *Over Cold War Seas* stands out as an excellent one-stop-shop for anyone seeking a crash course in maritime aviation during the Cold War. It combines a readable narrative, rigorous structure, wide coverage, and a superb selection of photographs. For students of naval history, aviation enthusiasts, or simply readers curious about the Cold War at sea, this book earns a strong recommendation.

Gary Connor, docent, National Packard Museum

Air Power and the Arab World 1909-1955 Volume 9: The Arab Air Forces and a New World Order, 1946-1948, & **Volume 10: The First Arab-Israeli War Begins, 15-31 May 1948.** By Dr. David Nicolle and Air Vice Marshall Gabr Ali Gabr. Warwick UK: Helion & Co., both 2023. Maps. Illustrations. Photographs. Notes. Pp. 58 and 68 respectively. $29.95 paperback each. ISBN: 978-1-804512-30-2 and 978-1-804514-24-5

Dr. David Nicolle has for many years devoted much of his research and publishing to military affairs in the Middle East. He has authored more than 100 books, mostly on warfare in the Middle East. Air Marshall Gabr is a veteran of the Egyptian Air Force who flew the de Havilland Vampire in the 1956 Suez Conflict and directed air operations in the 1973 war with Israel. These works are No. 59 and No. 62 in Helion's Middle East @ War series, and the 9th and 10th volumes in an extensive series about air power in North Africa and the Middle East.

In Volume 9, Nicolle focuses primarily on "the big three" Middle East nations: Egypt, Iraq and Syria. These states developed independent air forces after the end of World War II, as former colonial powers Britain and France reduced their military presence. Nicolle begins by reviewing each nation's efforts in 1946. Meanwhile, the other nations in the area (Lebanon, Jordan, and Saudia Arabia) neglected air power as part of their national defense strategies.

With the Zionists attempting to establish an independent state in British-controlled Palestine, the "big three" Arab nations reacted by enhancing their military power in 1947. By 1948, the three countries realized that they would likely have to defeat the Zionists, who had waged an unconventional war against the British and Palestinian Arabs in their drive to establish an independent Jewish state. As the deadline for the British departure neared, Egypt, Iraq and Syria each took steps to rapidly mobilize their militaries. Nicolle concludes this work with a chapter about the status of each country's military forces before the outbreak of conventional war.

In Volume 10, Nicolle offers a day-by-day accounting of the war's first two weeks. Covering each day, he summarizes, first, the land combat and, then, air operations.

Egypt advanced into Palestine from the south, Iraq from the east (where the battle for Jerusalem raged), and Syria from the north. Despite being decidedly outgunned, the Israelis held on. With the British departure, they had established the nation of Israel. Israeli ground forces possessed certain strategic advantages such as internal lines of communication and centralized command. However, the Israelis had almost no aircraft. Like the Arabs, they modified civilian transports to drop bombs.

In the air war, the Egyptians effectively used Supermarine Spitfires. The Syrians primarily operated North American AT-6 Texans.

Time favored Israel, as the new nation's population rapidly grew. Furthermore, the Israelis began to acquire the Czechoslovakian Avia S-199. These were built from the World War II remains of Messerschmitt Bf 109s. With experienced combat pilots at the controls, the S-199 posed a serious threat.

Anyone interested in the Arab perspective on the 1948 Arab-Israeli War needs to read these books. Modelers will also find Tom Cooper's illustrations of various Arab-operated aircraft helpful.

Steven D. Ellis, Lt Col, USAFR (Ret), docent, Museum of Flight, Seattle

Air-to-Air Missiles: Development and Combat Across 80 Years Volume 1: Technology, Development and Operation. By Bill Norton. Warwick UK: Helion, 2025. Bibliography. Notes. Photographs. Tables. Diagrams. Pp. 104. $29.95 paperback. ISBN: 978-1-804517-22-2

Norton's flight-test-engineering career spanned 40 years—20 as a USAF officer where he served as aircrew on test aircraft. Holder of an MS in aeronautical engineering, he has penned scores of technical papers, 17 books, and a multitude of magazine articles. He is also a pilot.

This is the first in a planned six-volume series intended to present a comprehensive history of air-to-air missiles from their earliest origins through modern systems. It establishes the technical and operational foundations necessary to understand air-to-air missile development, function, and combat employment. It addresses the motivations behind their creation, the challenges of integrating missiles with aircraft and onboard sensors, the design trade-offs inherent in missile construction, and the operational realities that shape missile effectiveness.

The introduction clearly explains why air-to-air missiles are central to modern air combat and why a solid understanding of their technology is essential. They are not independent weapons but components of an integrated combat system that includes aircraft sensors, avionics, tactics, and aircrew training. Norton examines the transition from gun-centric air combat to missile-dominated engagements and challenges persistent myths regarding missile performance. In doing so, he emphasizes that missile effectiveness cannot be measured solely by speed or range, but must account for engagement geometry, guidance logic, and countermeasures.

The chapter on development traces the evolutionary forces that have shaped missile design over the past eight decades. It explores early experimental concepts and the urgency after World War II; the technological acceleration driven by Cold War competition; and the continual balancing of competing requirements such as range, maneuverability, seeker sensitivity, and reliability. Norton highlights how combat experience repeatedly exposed flawed assumptions and forced redesigns, showing that missile evolution has largely been driven by incremental improvements rather than sudden revolutionary breakthroughs.

The section on missile elements forms the technical core of the book. Norton systematically breaks down a missile into its fundamental subsystems and explains how each contributes to overall performance. He examines seeker technologies (infrared and semi-active/active radar) and describes the guidance and control mechanisms that allow missiles to intercept maneuvering targets. Norton discusses propulsion systems (rocket motor design, burn profiles, and energy management) and examines airframe design and control surfaces through the stability-versus-agility lens. He also covers warhead and fusing mechanisms, lethality considerations, and the power and cooling systems required to support increasingly sophisticated electronics.

The final chapter shifts to operations fundamentals: how air-to-air missiles are used in combat, launch envelopes and no-escape zones, target tracking and sensor handoff, mid-course guidance and terminal homing, and how target maneuvering impacts success. Norton also discusses the role of countermeasures (chaff, flares, and electronic attack) and explains why many missile shots fail despite correct operation and nominal system performance.

An index would make the volume a better research reference, but Norton's professional experience and ability to make complex subjects accessible without oversimplification succeed in making this a strong technical primer. This volume effectively prepares the reader for those yet to come. It is an essential foundation for any serious study of modern aerial warfare.

Frank Willingham, NASM Docent

Vergeltungswaffen—The Third Reich's V-Missile: Then and Now. By Jean Paul Pallud. Barnsley UK: After The Battle, 2025. Photographs. Drawings. Pp. 288. $39.95. ISBN: 978-1-03610138-1

This expertly produced, richly illustrated survey of Nazi Germany's V-weapon programs strikes a deft balance between accessibility and technical rigor. Drawing on his decades of experience chronicling the physical remnants of World War II across Europe, Pallud offers a highly readable, visually engaging volume that makes an excellent companion to more academic works such as Michael Neufeld's *The Rocket and the Reich*.

Pallud organizes the book around the four recognized V-weapons: the *V-1* (FZG 76 flying bomb), *V-2* (A4 ballistic missile), *Hochdruckpumpe* (the fixed-site multi-chamber "England Cannon," later dubbed *V-3*), and *Rheinbote* (a four-stage artillery rocket). These last two programs—though given "V" labels for propaganda purposes—were regarded even by the Germans as technically flawed and militarily superfluous. Pallud addresses this distinction clearly, reinforcing the idea that "V" designations were tools of psychological warfare rather than genuine operational classifications.

This book excels in its ability to make the complex understandable. The chapters on the V-1 and V-2 programs are particularly rewarding, presenting a level of technical and operational detail that will satisfy the knowledgeable reader, while remaining fully accessible to general audiences. Pallud's clear prose is complemented by an outstanding selection of photographs, site diagrams, wartime documents, and modern "then-and-now" comparison shots—hallmarks of the *After the Battle* series.

Pallud pays close attention to the personalities behind the weapons. We meet not only Wernher von Braun, but also a constellation of scientists, engineers, and political figures whose interwoven ambitions and rivalries shaped the programs. Unlike Neufeld, Pallud avoids diving into deep moral or ethical critique. He presents numbers and facts—the horrifying statistics of slave labor at Mittelwerk and Dora, for example—but refrains from direct judgment. Where Neufeld makes the human cost central to his narrative, Pallud relies on Neufeld's work to frame the political, strategic, and moral contours of the V-2 campaign. He cites Neufeld to underscore internal Nazi tensions (notably between the Army and SS), the strategic futility of the rocket attacks, and the systemic use of forced labor. In this way, the two books complement each other well. Pallud gives you the *where* and *how*—the mechanics and the physical traces that are still visible today. Neufeld gives you the *why*, and at what *cost*.

However, Pallud's approach occasionally leads to missed opportunities. The chapter on the *Hochdruckpumpe* is his thinnest, and it is striking that no mention is made of the postwar *Project Babylon*, Gerald Bull's resurrection of the multi-chamber supergun concept for Saddam Hussein, or Bull's 1990 assassination, widely believed to have been carried out by Mossad. The conceptual throughline from the V-3 to Bull's designs is unmistakable, and its absence is surprising in such a thorough volume.

For readers who find themselves returning to the moral ambiguities of the V-2 legacy, the sanitized treatment of Wernher von Braun remains troubling. The US government's handling of von Braun was a masterclass in Cold War pragmatism—strategic opportunism wrapped in American myth-making. The American government and military shielded and celebrated a man who had knowingly used enslaved laborers and later transformed him into a national hero. In many ways, the US treated von Braun the way he treated his workers at Dora: as a convenient and expendable means to an end.

Despite the von Braun problem, Pallud's book is a triumph of research, organization, and visual presentation. Apart from a handful of minor editorial oversights, the book is polished, detailed, and deeply informative. It captures the material history of the Nazi vengeance weapons without resorting to myth or glorification. Readers new to the topic or those familiar with Neufeld, Irving, or Ordway will find this a superb addition to your shelf. It receives my strongest recommendation.

Gary Connor, docent, National Packard Museum, Cortland OH

Shadow Flyer: The Life of Bob Ericson CIA and NASA U–2 Pilot. By Chris Pocock. Uxbridge UK: dragonladyhistory.com (independently published), 2025. Maps. Photographs. Bibliography. Pp. ix, 253. $20.00 paperback. ISBN: 979-8-3194-5466-9

British historian Pocock has established himself as one of the foremost experts on the Lockheed U–2. Over the years, he has written several detailed accounts of this iconic aircraft. He also maintains a website emphasizing his interest in the U–2. In this instance, Erickson's two children asked Pocock to write this biography.

Erickson's Air Force career began in the middle 1950s flying the Republic F–84 escort fighter for the Strategic Air Command. When the Central Intelligence Agency (CIA) sought pilots for its secret spy planes, Erickson signed up. During the next 20 years, he amassed over 4300 flying hours piloting the various U–2 models all over the world. In September 1956, two months after moving to the CIA, Ericson flew the U–2 for the first time. He completed his first operational flight, which covered eastern Russia, in the summer of 1957. Over the next couple years, he deployed to assorted locations on the Russian periphery. Besides photography, the missions increasingly emphasized the electronic spectrum. Furthermore, images revealed the construction of numerous surface-to-air S-75 Divina (known in the west as the SA-2 *Guideline*) missile sites. At the time, US intelligence estimated the missile's maximum effective altitude as 60,000 feet. Later that estimate changed to 70,000 feet, the U–2's operating altitude.

On May 1, 1960, an SA-2 downed Francis Gary Powers and his U–2. The flight schedule listed Ericson as the backup to Powers. So ended the American overflights of Russia in the U–2. However, growing concerns about mainland China prompted the CIA to launch missions from Taiwan. Taiwanese pilots flew some of the missions. Ericson and other Americans actively supported the Taiwanese over the next few years.

In the late summer and fall of 1962, tensions increased over Russian deployment of missiles to Cuba. Ericson overflew the island two months before a newly operational SA-2 shot down an Air Force U–2, killing Major Rudy Anderson.

The book's second half reveals how Ericson handled significant changes to the original U–2 airframe. The intelligence community demanded better sensors and aircraft performance. For example, political considerations prompted the government to consider operating flights from aircraft carriers. Ericson became proficient at landing and taking off from them. After leaving the CIA, he flew research U–2s for the National Atmospheric and Space Administration for several years.

Drawing on his extensive knowledge of the U–2 program, Pocock neatly blends his insights with the personal information provided by the Ericson family. He also avoids the all-too-common trap of suggesting what the individual in question might have been feeling or thinking. This book is highly recommended for anyone interested in the U–2 and American intelligence requirements at the height of

the Cold War. However, readers familiar with Pocock's other books may encounter some redundancy.

Steven D. Ellis, Lt Col, USAFR (Ret), docent, Museum of Flight, Seattle

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The Yugoslav Air Force in the Battles for Slovenia, Croatia, and Bosnia & Herzegovina 1991-1992 Volume 2. By Aleksandar Radi . Warwick UK: Helion & Company, 2025. Appendices. Notes. Maps. Photographs. Illustrations. Pp. 68. $29.95 paperback. ISBN: 978-1-914059-17-9

In 1991, the Yugoslav military (JNA) suddenly found itself at war within its own country. The Yugoslav Federation, comprising six republics, fell into chaos as the country slowly disintegrated into separate nations that fateful year. As Yugoslavia fell apart, so went the JNA. Many of its officers and enlisted men elected to join with their respective republics. The first republic to break away was Slovenia which, fortuitously, had only a very small Serb minority. This made it easier for Serbia, the dominant republic in Yugoslavia, to accept the loss. However, the next republic to secede was Croatia, which had a sizeable Serb minority. This is where open conflict began.

The Yugoslav Air Force, previously untested in combat, found itself fighting a war on its own doorstep. During the early days of operations over Croatia in mid-September 1991, it quickly lost nine aircraft to *Strela* man-portable missiles and would go on to lose during the conflict a total of 25. Radi , a highly informed Serb military analyst, relates how the General Staff's Air Test Center and its Aviation Test Center reacted by adjusting the use of aircraft and armaments and tactics for greater effectiveness and aircraft survivability. However, from my own experiences in ground combat, I sensed what appeared to be lacking. In the accounts of the Yugoslav Air Force's response to Croat attacks on Serb units, there was no employment of trained ground controllers assigned at the unit level to make accurate and effective use of close air support aircraft. Instead, the air force was ineffectual in stopping the Croats from imposing a blockade of JNA facilities within Croatia as they asserted Croatian sovereignty. The outcome allowed Croatian forces to acquire large stocks of weaponry for the expanding war. This volume ends with the November 1991 fall of the Croatian city of Vukovar, crushed by JNA artillery and airstrikes.

The monograph is nicely supported with illustrations and photographs of JNA aircraft and helicopters with accompanying data. Aircraft weaponry and anti-aircraft armaments are also discussed with some detail and supported by photographs. Detailed maps provide a very useful reference for the narrative.

On a personal note, I visited many of the air bases mentioned in this volume. I had been in Yugoslavia prior to the conflict, during the actual war while serving on a special team, and later as a senior member of NATO forces in Bosnia. Radi 's accounts brought back memories of MiG–21s and Mi-8s and my inspection of the extensive damage intentionally inflicted on Mostar's runway as the JNA withdrew its forces. When at Zadar's Zermunik airfield, a young Croat militia member told me that his father, a JNA colonel, had been detained by the Serb dominated military. At that moment we came under fire from the Krajina Serb militia, reminding me that the war was real and deadly.

John Cirafici, Milford DE

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Wings of Argentina: Argentina's Aircraft Industry Since 1927. By Santiago Rivas and Fernando Benedetto. Manchester UK: Crecy, 2025. Photographs. Drawings. Bibliography. Index. Pp. 384. $49.95. ISBN: 978-1-90210967-1

This book is a monumental contribution to the growing literature on Latin American aviation history, and one that deserves a place on the shelf of every serious aviation and military historian. It is not a casual read. Handsomely bound and printed on heavy, high-quality paper in a large-format presentation, the book radiates the care that went into its production. The editorial polish is equally impressive: the English text is far above the norm for works of this type and reflects careful editing and an understanding of both technical and narrative demands. The authors provide a comprehensive, richly documented, and visually stunning survey of a subject often treated in brief summaries or specialist articles.

One of the book's most remarkable features is a treasury of photographs, many never widely available, along with beautifully reproduced drawings that capture the ambition of Argentina's aviation designers. Captions are concise, clear, and informative.

My primary interest lay in the Axis aircraft designers who found Argentina welcoming under the Peronist regime. In the immediate postwar years, Juan Perón extended invitations to some of the most inventive, but politically compromised, engineers of Europe. Kurt Tank, formerly of Focke-Wulf, and the Horten brothers are well-known names; but the book rightly emphasizes the significant contributions of figures such as Emile Dewoitine and César Pallavicino. Their work not only shaped a generation of Argentine prototypes but also embedded European design philosophies in the nascent industry. When Peron fell, many of these figures departed for Europe, the Middle East, and beyond; but their Argentine interlude left a profound mark.

The centerpiece of this story is Tank's IAe Pulqui II. The book presents it not as an oddity, but as a design genuinely competitive with contemporary fighters such as the

F–86A and MiG–15bis. The Pulqui II shared their swept-wing configuration and offered broadly comparable performance. What doomed it was not aerodynamics or engineering talent, but the structural weakness of Argentina's aviation sector, which remained closer to cottage-industry than mass production. Lacking the infrastructure and capital of the US or USSR, Argentina could never bring the Pulqui II to serial production or export markets. This balance between technical achievement and industrial limitation is handled with clarity and sympathy.

Beyond the marquee prototypes, the authors also cover the vital sphere of licensed production. Argentina's efforts to produce Curtiss Hawks, Mosquitos, and Ju 52s under license—or to adapt their features into indigenous hybrids—played a crucial role in building technical capacity and establishing a workforce with advanced skills. For readers less familiar with aviation engineering, these sections are particularly valuable, making it easy to see how DNA from better-known aircraft appeared in "Argentine designs."

The book's final chapters move into the space age, connecting Argentina's satellite launcher projects to data exchanges surrounding the American Pershing II program. German firms, American designers, and Argentine partners all left Argentina with ambitions, if not always sustained capacity, in space-launch technology. By situating Argentina within the wider Cold War technological web, the authors bring the story full circle—from émigré engineers after 1945 to the geopolitics of missile and space systems four decades later.

Wings of Argentina is not a recreational read. It is clearly written; but the wealth of technical specification, production detail, and archival context requires sustained reader engagement. This density is what gives the book its enduring value. There are hidden gems such as an overlooked photograph, a revealing technical sketch, or a subtle connection between Argentine programs and global developments that accumulate to form a picture of Argentina's aviation sector that is richer and more complex than previously appreciated. The book is not only a lavishly illustrated reference but also as a serious work of scholarship—one that reshapes our understanding of how a mid-sized agrarian nation attempted to insert itself into the technological currents of the Cold War. For armchair aviation enthusiasts and professional historians alike, this volume offers both substance and surprise, and it deserves to be considered a standard reference in the field.

Gary Connor, docent, National Packard Museum, Cortland OH

Battle of Britain Daylight Defeat: 18 September 1940 - 30 September 1940. By Dilip Sarkar. Barnsley UK: Air World, 2025. Photographs. Index. Bibliography. Pp. 252. $49.95. ISBN: 978-1-39903464-7

Daylight Defeat is the sixth volume in Dilip Sarkar's planned eight-part chronicle of the Battle of Britain, and it continues many of the hallmarks that have come to define this series: deep archival research, thoughtful integration of first-person accounts, and a commitment to preserving the human experience behind the aerial combat.

As in his previous works, Sarkar builds heavily—and respectfully—on earlier scholarship, most notably Francis Mason's superb *Battle Over Britain*. At times, his integration of prior material is so seamless that it becomes difficult to separate Sarkar's original contributions from the foundation he is building on. This speaks not to any lack of originality but, rather, to Sarkar's skill as a synthesist and his evident command of the subject.

Stylistically, Sarkar weaves participant anecdotes into a flowing narrative. The voices of pilots and crews are given ample space, adding authenticity and immediacy. However, the sheer volume of these accounts—often laced with repetitive combat phrases such as "I gave him a squirt" or "the plane exploded"—can become numbing. In that sense, unintentionally, the book mirrors the mental fatigue and sensory overload experienced by those who lived through this grinding campaign.

The narrative focuses on a two-week period in which the Luftwaffe, once again, shifted tactics and targets. Sarkar uses this window to illustrate the grinding nature of the campaign and the asymmetries on both sides. The British, though badly stretched, proved more adaptive—rapidly evolving tactics while managing to replace both aircraft and pilots at a remarkable pace. The Luftwaffe, by contrast, struggled to prosecute a strategic air war without a strategic bomber, eventually resorting to single-engine Bf 109s dropping solitary bombs on individual targets. Meanwhile, the German training pipeline remained geared toward replenishing bomber crews, seemingly blind to the escalating losses among its fighter force. The result is not a narrative of triumph, but a sobering meditation on improvisation, miscalculation, and the exhausting stalemate of attritional warfare.

The standout portion of the book is the "Reflections" chapter, where Sarkar steps back from operational detail to consider the broader implications and lived experiences of the battle. It is a thoughtful, mature piece of writing that offers the kind of insight missing from more statistics-driven treatments of the air war.

Less successful is the placement of a lengthy appendix on Luftwaffe bomber tactics and formations. While useful, it feels oddly positioned in Volume 6 rather than as contextual groundwork in an earlier book. Likewise, the editorial polish does not meet the exacting standards of earlier volumes. Sarkar favors long, winding sentences. In one case, a Do 215 morphs into a Ju 88 and then into a generic "enemy aircraft" within the same complex sentence—jarring for a reader trying to follow the action closely.

That said, *Daylight Defeat* remains a worthwhile read. I would not hesitate to recommend this—or any of Sarkar's

books—to the dedicated armchair aviation historian. But this is a book best approached not for groundbreaking revelations, but for the richness of its detail, the humanity of its storytelling, and the care with which it documents the lived experience of aerial warfare.

Gary Connor, docent, National Packard Museum, Cortland OH

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RAF Fighters vs Ju87 Stuka in the West 1940-41. By Andy Saunders. Oxford UK: Osprey, 2025. Photographs. Drawings. Charts. Maps. Bibliography. Pp. 80. $23.00 paperback. ISBN: 978-1-47286-257-0

Saunders' book is a compact study of clashes between British fighter aircraft and Germany's primary dive bomber during the early years of World War II. While the book effectively details the engagements, tactics, and performance of the aircraft involved, one of its most striking themes is that both sides fought with designs that were increasingly outdated. This analysis raises the question of whether the RAF of the period had access to the types of tactical insights that Saunders provides, or if they were learning primarily through hard-won experience.

The Ju 87 Stuka was already showing its vulnerabilities by the time of the Battle of Britain. While it had been highly effective in Poland and France against a decentralized air defense system employing antiquated aircraft, it proved alarmingly susceptible to modern fighters in combat over France and Britain. Its slow speed, poor defensive armament, and rigid attack profiles made it an easy target for British pilots. The aircraft's obsolescence was so evident that the Luftwaffe quickly reduced its role over Britain, and the Stuka only survived by shifting to "softer" targets whenever possible.

Yet, the RAF's fighters were hardly innovative themselves. The Hurricane, which withstood most combat against the Stuka, was a pre-war design with a slow top speed and anemic armament. While effective against bombers, it struggled against more advanced German types. The Spitfire, though more modern, was still evolving in armament and tactics, and its pilots were often inexperienced in the best ways to counter enemy formations. Even the RAF's tactics were still in flux, as outdated tight formations and rigid command structures limited their effectiveness against evolving German tactics. Saunders reminds the reader that even the biplane Gloster Gladiator and bizarre Boulton-Paul Defiant were thrown into the fray against the Stuka.

Saunders' analysis of these engagements highlights the desperate need for better aircraft, tactics, and training. Both the Luftwaffe and RAF were fielding machines that were already showing their age, and both sides would quickly seek replacements or significant upgrades. The book's tactical breakdowns—such as how the Stuka's vulnerability could be exploited or how RAF pilots adjusted their interception methods—suggest a level of analytical insight that the RAF may not have fully possessed at the time.

Saunder's book contains a significant amount of redundancy to stretch the narrative to 80 pages. His description of the source of the name "Stuka" is presented numerous times, while his overuse of adverbs became a distraction. Captions to photos and drawings frequently restated narrative text. To me, the narrative seemed driven by an attempt to stretch to story to the 80-page target. Saunders' book follows the Osprey formula of excellent imagery, solid research, and inclusion of first-person stories. It is slightly less expensive than most Osprey literary hors d'ouvres and probably a fair value.

Gary Connor, docent, National Packard Museum, Cortland OH

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A History of the Mediterranean Air War, 1940-1945, Volume Six: The Strategic Bombing Campaign over Southeast Europe, 1 November 1943-30 June 1944. By Christopher Shores and Russell Guest. London: Grub Street, 2025. Photographs. Bibliography. Appendices. Indices. Pp. 591. $89.95. ISBN: 978-1-911714-23-1

This journal has had the privilege of reviewing earlier volumes in this series; and, with each installment, the scale, ambition, and scholarly rigor of the project has become ever more impressive. Volume 6 continues that tradition (and, in many respects, surpasses it) despite being produced under poignant and difficult circumstances. Both Christopher Shores and Frank Olynyk, two of the series' guiding intellectual forces, passed away while this volume was in preparation. That the final product shows virtually no deviation in style, substance, or methodological consistency from its predecessors is a testament to the strength of the team they built and the clarity of the project's original vision.

From its inception, this series has been a monumental undertaking, and Volume 6 reinforces that sense of scope. The research is prodigious; the documentation exhaustive; and the attention to operational details of aircraft, units, missions, losses, and personalities remains unmatched in the literature of the Mediterranean air war. Originally conceived as a single volume covering the strategic air campaign, the sheer volume of material forced the authors to divide the undertaking into two parts. As a result, Volume 6 addresses only the initial stages of the theater's strategic bombing story, necessarily leaving its narrative arc incomplete. Yet even in partial form, it proves exceptionally rich and tightly focused.

One of the most valuable contributions to this installment is the way it sets the stage for the complex multina-

tional air operations to come. The authors effectively integrate the smaller, but operationally significant, air forces of Hungary, Romania, and Yugoslavia into the region's broader Table of Organization and Equipment. The introductory material provides a concise, clarifying reassessment of earlier attacks on the Axis oil complex at Ploesti, efficiently dispelling several persistent myths while avoiding digression or overcorrection.

The authors also give long-overdue attention to the RAF's 205 Group, whose medium bombers—often obsolescent and markedly inferior to their American counterparts—were nonetheless directed against strategic targets. These chapters illuminate a frequently overlooked, but essential, component of the Allied effort; and they do so with the same blend of precision and narrative drive that characterizes earlier volumes.

As always, the hallmark day-by-day structure yields both strengths and limitations. The clarity, accuracy, and fidelity to the historical record are beyond dispute, but the inevitable repetitiveness of operational accounts can become taxing. At times, it mirrors the grind described in airmen's memoirs—the unrelenting tempo, the familiar patterns, the incremental shifts in fortune. This is not, perhaps, a book to be read straight through in a week. Instead, it is a magnificent reference: a volume to be returned to repeatedly for its reconstruction of missions, periods, or air actions. If this volume accurately reflects the quality of the entire seven-volume set, then the completed series will stand as one of the most valuable tools future researchers possess.

I eagerly await Volume 7, not only to complete the narrative, but also to appreciate the full sweep of the strategic air war in the Mediterranean. A final note: at roughly five pounds, this volume dwarfs the average book's meager six-to-eight ounces. Anyone acquiring the complete set may want to reinforce their bookshelves—but the intellectual weight of the collection is even more significant.

Gary Connor, docent, National Packard Museum

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Memories of the Last of the Original Space Warfighters. By Paul Szymanski. Independently published, 2025. Illustrations. Pp. 258. $59.52 paperback. ISBN: 979-8-31057844-9

Based on his half-century of experience as a military space strategist, Paul Szymanski, founder and president of the Space Strategies Center in Albuquerque, New Mexico, might well be "the last of the original space warfighters." Hence the title of the fifth volume in his recently published *Battle Beyond–Fighting Space Wars!* series, which follows in order of publication his and futurist Jerry Drew's highly acclaimed *The Battle Beyond: Fighting and Winning the Coming War in Space*.

Readers expecting a skillfully written narrative in a traditionally formatted chronicle will undoubtedly find Szymanski's book flummoxing, if not disappointing. The first two-thirds of the book consist of full-page, colorful, original PowerPoint slides culled from his previously delivered lectures on various topics related to space warfare, accompanied on each opposite page by textual explanations of each slide and, on many of the pages, a "Paul Remembers" anecdotal box. A six-page, question-and-answer section, followed by a more entertaining, four-page "Paul Remembers Yap Island" recollection, fill the middle portion of Szymanski's book. The last third consists of a series of "Backup Charts" lacking textual explanations.

Perhaps the book's most clearly stated, most thought-provoking themes appear on an early page titled "Foundation of Space Warfare." In four succinct paragraphs, based on wisdom gained over many decades, Szymanski asserts that fighting a space war is more about shaping the peace afterwards. Essentially, it is about "attacking the minds and will of the military fighting on the Earth, and their political leaders that control them." Space warfare—in fact all human conflict—is not primarily about superior military technology but about which adversary commander has the better mind. Szymanski reenforces that point by drawing examples from World War II and the ongoing Ukrainian conflict.

Careful study of his PowerPoint slides, especially those with accompanying textual explanations, enables readers to understand the complexities underlying his advocacy for an informed approach to fighting and winning any war involving space capabilities. With respect to other topics, Szymanski's material covers the evolution of anti-satellite concepts, attack incidents, potential space threats, unique characteristics of space systems and means of attacking them, cyber-attacks on satellites, a hierarchy of space-power countries and related political issues, space-to-earth weapons, and much more. Even a cursory examination of his slides suggests abundant educational possibilities for Guardians in the US Space Force. A comparison between his assessment of "Ukrainian Conflict Escalation Control" and RAND's *Lessons from the War in Ukraine for Space* (May 2025), for example, might prove worthwhile.

Admittedly, *Memories of the Last of the Original Space Warfighters* undoubtedly would bore most members of the public. On the other hand, military space professionals, professors and students in institutions offering space-related courses, some government officials and politicians, a few corporate leaders, and assorted other types of specialists would benefit from perusing this and, probably, the other volumes in the *Battle Beyond–Fighting Space Wars!* series. A few might even decide the entire series warrants space on their bookshelves.

Dr. Rick W. Sturdevant, Director of History, HQ Space Training and Readiness Command

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Estonian Aviation to 1940. By Arvo Lennart Vercamer. Reno NV: Aeronaut Books, 2025. Photographs. Illustrations. Tables. Appendices. Pp. 258. $59.99 paperback. ISBN: 978-1-964637-09-9

This book delivers an encyclopedic, yet remarkably readable, treatment of the birth and evolution of Estonia's military and civilian aviation establishment from its beginning to the eve of Soviet occupation. Part of Aeronaut's Great War Aviation Centennial Series, it is the first English-language monograph to rigorously examine Estonian airpower in the interwar period and its roots in the chaotic aftermath of the Great War.

The four major sections on history of aviation in Estonia, Estonian Air Defense Force aircraft, civilian aviation, and a review of unrealized or proposed acquisitions allow the reader to approach the material either as an integrated history or as a reference tool. The first section on Estonian civilian and military aviation history is by far the most substantial and narratively rich, charting a trajectory from 19th-century balloon ascents through Russian and German occupation phases to consolidation of a national air service during the War of Independence (1918-1920).

There are excellent personnel histories—many on Baltic-German or Estonian nationals who served in the Russian Imperial Military Air Fleet prior to the Bolshevik collapse—that reconstruct movements, unit affiliations, and technical responsibilities. Aircrew such as Jaan Mahlapuu and Jakob Tillo become not merely names in an order of battle, but aviators shaped by the geopolitical rupture of empire and revolution. This human element is matched by detailed accounts of organizational reform and aircraft procurement, including the transition of seized or donated imperial matériel—Farmans, DFWs, Sopwiths, and Short 184s—into an Estonian force.

Over 500 images are distributed throughout the text, many drawn from private or institutional archives, depicting aircraft, insignia, uniforms, and base infrastructure with unusual specificity. Color profiles offer visual reconstructions of aircraft such as the Halberstadt C.V, Sopwith Camel, and the Grigorovich M.16, several of which served in highly modified or hybridized configurations under Estonian markings. Combined with tables of serial numbers, dates of service, and disposition status, they elevate the book's value for researchers.

Importantly, this is not a narrowly military account. The book devotes considerable space to Estonia's early civil aviation endeavors, including the establishment of the Aeronaut airline, cooperation with German and British manufacturers, and attempts at international mail service and passenger flights. The role of domestic mechanics, logistical officers, and local industry is also acknowledged—often overlooked strata in national-aviation histories.

While the text does not shy away from political complexities (e.g., recognition of Estonian sovereignty, Bolshevik incursions, and the shadow of German Landeswehr ambitions), its tone is measured. Vercamer's archival fidelity is evident in his citation of source data.

There is formidable detail—particularly in the rosters and equipment listings—which, while invaluable for researchers, may prove daunting to readers unfamiliar with the Baltic region's interwar geopolitics. However, the inclusion of contextual notes and well-chosen appendices mitigates this, allowing the reader to navigate the material with greater ease.

In sum, this is a landmark reference work: comprehensive, visually rich, and archivally grounded. For students of Baltic history, interwar aviation, or the legacy of Imperial and early Soviet airpower, it is indispensable. It balances scholarship with accessibility and restores a forgotten air arm to its rightful historical prominence.

Carl J. Bobrow, Quondam Alfred Verville Fellow, National Air and Space Museum

Constant Shotgun: A Cold War Memoir. By Col Glenn Whicker, USAF (Ret). Whickstone Enterprises, 2025, Maps. Tables. Diagrams. Illustrations. Photographs. Appendices. Glossary. Pp. 290. $18.99 paperback. ISBN: 978-0-9996402-1-0

In *Constant Shotgun,* Whicker reveals his personal experience with a little-known Cold War initiative that feels as improbable as it is compelling: American and Soviet airmen flying together under a mutual escort agreement during a time of intense geopolitical rivalry.

While most Cold War narratives focus on espionage, nuclear brinksmanship, or ideological conflict, Whicker's account introduces readers to a softer—yet no less dangerous—facet of the East-West struggle: military-to-military cooperation in the skies. This program, dubbed *Constant Shotgun***,** tasked US aircrews with sitting side-by-side on Soviet transports, including the world's largest aircraft, the Antonov An-225 Mriya, traveling through Siberia, Cuba, Newfoundland, Alaska, and more.

In this memoir, Whicker peels back the curtain on a Cold War subplot that most Americans (and Soviets) never knew existed. These often tense, but occasionally warm, interactions highlight the deeply human moments that unfolded between supposed enemies. *Constant Shotgun* was built on a paradox—cooperation between military aviators who had been trained to see each other as enemies. Whicker captures the quiet heroism in this mutual professionalism.

The memoir shines brightest when it's deeply personal. Whicker's descriptions of riding aboard Soviet aircraft offer a visceral, sometimes surreal, sense of shared risk and mutual dependence between former Cold War adversaries. Perhaps most surprising are the warm relationships that emerge between American and Soviet aircrews,

formed over shared meals, flight preparations, or tense hours at cruising altitude.

From the icy runways of Siberia, to the subtropical airfields of Cuba, and across the remote corridors of Newfoundland and Alaska, Whicker captures the expansive geographic and political terrain traversed by the *Constant Shotgun* program.

Constant Shotgun is a refreshingly original Cold War memoir—one that tells a lesser-known but deeply meaningful story. It avoids the well-trodden spy-versus-spy narrative in favor of mutual respect, duty, and quiet courage. For readers interested in aviation, military diplomacy, or Cold War history from an unexpected angle, this is a must-read.

Colonel Charles P "Chuck" Wilson, USAF (Ret); Emeritus Chairman of the Board, The Cold War Museum®; U–2 pilot and commander; NASM docent

Swordfish Units of World War 2. By Matthew Willis. Oxford UK: Osprey Publishing, 2025. Photographs. Illustrations. Appendices. Bibliography. Index. Pp. 96. $25.00. ISBN: 978-1-47286510-6

This is an excellent account of the development and operation of one of the most recognized aircraft of the Second World War. A recent addition to Osprey's *Combat Aircraft* series, it is an in-depth work of detailed information, photographs, profiles, and firsthand accounts. Author Willis specializes in naval and aviation history and has written many books as well as articles for *Aeroplane, Flight Path, The Aviation Historian,* and *Flypast.*

The Swordfish was Fairey's response to an early-1930's Fleet Air Arm (FAA) requirement for an aircraft that combined torpedo attack, reconnaissance, and gunnery spotting. Beating out other competitors, the Swordfish entered production in 1935 with an initial order for 86 aircraft. No. 825 Squadron formed in 1936. The Swordfish I began replacing Blackburn Baffin torpedo planes and Fairey Seal spotter/reconnaissance aircraft in earnest.

Though the primary weapon of the Swordfish was the aerial torpedo, as World War 2 progressed, it became evident that Swordfish performance characteristics made it difficult to attack well-defended targets. For similar reasons, the Swordfish performed as a level bomber vice dive bomber. In its final iteration the Swordfish was armed with depth charges or eight RP–3 rockets for the anti-submarine role. The Swordfish I was the first production series and included the option for floats when used from catapult-equipped warships. The Swordfish II, introduced in 1943, had metal lower wings to permit mounting of RP–3 rockets. The Swordfish III added the Anti-Surface Vessel (ASV) Mk.IX radar unit for submarine hunting. The Swordfish III was also introduced in 1943, illustrating how quickly technology could change and how quickly the Swordfish could be adapted to accept changes. An enclosed-cabin Swordfish III became the Swordfish IV in Royal Canadian Air Force (RCAF) service.

By the outbreak of World War 2, Swordfish equipped thirteen FAA squadrons; two catapult units (with Swordfish floatplanes); and eleven Torpedo, Spotter, Reconnaissance (TSR) units deployed on five fleet carriers (HMS *Ark Royal, Courageous, Glorious, Eagle*, and *Hermes*). Wartime service included operations in Norway; action against the DKS *Bismarck*; attacks on Mers el-Kebir, Taranto, and Matapan; and anti-submarine protection and convoy escort across the North Atlantic. In the latter role, the aircraft flew from escort carriers and merchant aircraft carriers. Swordfish also served in the Royal Air Force (RAF), the RCAF, and the Royal Netherlands Navy (as FAA No. 860 Squadron).

The book's six chapters offer a tight and extensively researched history of the Swordfish excellently supported with firsthand accounts from flight crews. The black-and-white photos vary in level of detail from individual aircraft views (with some close-ups) to action scenes. The captions succinctly explain each scene and easily tie in with, and complement, the narrative. The 22 color aircraft profiles illustrate variations in camouflage schemes and unit markings of operational Swordfish. There are abbreviated captions with each profile and detailed commentaries later. Two appendices clarify squadron numbering and front-line units.

This is a great addition to Osprey's series. The firsthand accounts and well-sourced information are well worth the price alone. The photographs and color illustrations are icing on the cake. Being a modeler and aviation fan, it's a keeper in my library and worth your read.

Tim Hosek, USG (retired)

The Air War at Sea in the Second World War. By Martin W. Bowman. Barnsley UK: Pen & Sword Aviation, 2023. Photographs. Index. Pp. 285. $62.95. ISBN: 978-1-52674-635-2

Bowman is one of the UK's most distinguished aviation historians, with more than 100 published works to his credit. In this book, he weaves an extraordinary narrative of the courage, daring, and tenacity of Royal Navy and US Navy pilots and aircrews who played pivotal roles in achieving victory in the Second World War. Often flying against tremendous odds and at tragic cost, these men defended and secured the world's oceans from the Axis.

This book explores the crucial role of airpower at sea from the earliest stages of the war through its conclusion in both theaters. Bowman skillfully outlines strategies and supporting operations. Using diaries, letters, flight logs, and mission reports, he guides the reader through perilous

missions flown over the frozen seas of the North Atlantic, the temperate skies of the Mediterranean, and the tropical expanses of the Pacific.

From the Battle of Narvik in the North Sea to the surrender of Japan, Bowman deftly traces the evolution of carrier warfare throughout the war. The reader experiences the air war through the eyes of the aircrews who flew one hazardous mission after another, whether hunting German commerce raiders and U-boats in the North Atlantic or searching for Japanese carriers across the vast Pacific. These aviators faced overwhelming odds to engage and defeat the enemy and then struggled home to their carriers, often with heartbreaking losses.

Bowman's use of firsthand vignettes pays tribute to the airmen's exceptional airmanship, initiative, ingenuity, and courage. He introduces readers to their exploits in actions such as the 1940 attack on the Italian fleet at Taranto (Operation *Judgement*), where the Fleet Air Arm executed a coordinated bombing and torpedo assault with remarkable success. That victory established naval aviation as the decisive weapon against surface fleets. Reports on the attack, obtained by Japanese attachés in Berlin, directly aided Japanese planning for Pearl Harbor.

Transitioning from the Atlantic to the Pacific, Bowman summarizes the planning and execution of air attacks on Japanese battle fleets during the Battles of the Coral Sea, Midway, the Solomons, and the Philippine Sea, once again placing the reader in the cockpit alongside naval aviators confronting the Imperial Japanese Navy.

Of note are Bowman's accounts of the Royal Navy's Swordfish crews and the US Navy's SBD Dauntless dive-bombers and TBD Devastator torpedo aircraft. Their collective gallantry and determination, often in near-suicidal circumstances, contributed to the sinking of the *Bismarck* and *Tirpitz* in the Atlantic, and the *Akagi*, *Kaga*, *S ry* , *Hiry* , and *Sh h* in the Pacific. He also highlights the pivotal role of long-range reconnaissance and anti-submarine warfare by aircraft such as the Sunderland and PBY-5 Catalina flying boats. Serving as the eyes of the Allied fleets, these aircraft located and identified enemy ships and directed strike aircraft to their targets. Against the U-boat threat to Allied shipping, the Sunderland (credited with the first air-to-sea kill of a submarine) and the Catalina helped transform the German U-boat from hunter to hunted.

Bowman's work serves as an excellent primer for readers seeking a comprehensive introduction to the air war at sea. As a student of military aviation history familiar with the Battle of Britain, the air war over Europe, and the Pacific campaigns, I found Bowman's book to be an engaging, well-researched account of how airpower at sea—and the valor of its aviators—helped secure Allied victory in the Second World War.

COL Anthony J. MacDonald, USA (Ret)

Käte & the Red Baron: Käte Oltersdorf & Manfred von Richthofen—Her "Restless Patient." By Lance J. Bronnenkant, PhD, and Obersleutnant Reinhard Schröder. Reno NV: Aeronaut Books, 2025. Photographs. Illustrations. Appendices. Bibliography. Index. Glossary. Pp. 206. $49.99 paperback. ISBN: 978-1-964637-35-8

The literature on Rittmeister Manfred von Richthofen (MvR) is vast, and one might assume that little new could be uncovered about the famed "Red Baron." Yet *this book* overturns that assumption by presenting the diary of Sister Käte Oltersdorf, the nurse who tended MvR after his head wound on 6 July 1917. Supplemented with his medical records, contemporary drawings and correspondence, and more than 300 photographs, the book provides a rare view of Germany's ace of aces during his most vulnerable weeks.

The foundation of this book lies in the donation of Oltersdorf's diary, two photograph albums, and related artifacts to the modern Luftwaffe's Tactical Air Wing 71 "Richthofen" (the unit that preserves the Richthofen tradition). The authors undertook the painstaking transcription and translation of her handwriting, supplementing her testimony with medical files and drawings and letters that capture the social atmosphere of Jasta 11 during this enforced pause. The editors have preserved all material with exemplary rigor.

Oltersdorf was no propagandist but a professional nurse recording her candid impressions of a famous patient. Her notes capture the rhythms of daily care. Since the mid-nineteenth century (most visibly during the Crimean War and Florence Nightingale), there has existed a distinctive relationship between the wounded soldier (often a deeply intimate one with the soldier exposed at his most vulnerable) and the nurse embodying her most compassionate role. Through her eyes, MvR appears not as the mythic knight of the air but as a restless young man, alternately irritable, humorous, and grateful. Her testimony humanizes the ace through small details—feeding him with a teaspoon, quieting his anxieties, and managing his endless stream of admirers.

These records illuminate the effects of Richthofen's head wound: headaches, temporary paralysis of his right side, and neurological after-effects persisted for weeks and suggest the lasting fragility behind his eventual return to combat. At the same time, Oltersdorf's entries highlight his modesty and sense of responsibility. He credited comrades with superior marksmanship and preferred giving portraits to Oltersdorf's wounded soldiers rather than society admirers. Yet he remained defiant in his desire to return to flying. He is revealed as a human being: patriotic, dutiful, but also weary, mischievous, and anxious. Oltersdorf's voice adds a rare female perspective to a field dominated by male narratives.

Käte & the Red Baron will not satisfy those seeking detailed operational history or technical analysis. Its scope is

narrow (July-August 1917), but this concentration yields unparalleled depth. The medical files, drawings, and photographs make the book a work of considerable scholarly value. It humanizes MvR and restores Oltersdorf from obscurity, giving her testimony equal weight. If one criticism may be made, the heavy annotation occasionally interrupts the narrative flow for general readers. Yet, for historians, that rigor is indispensable, and it secures the book's place as a major contribution to von Richthofen studies.

This is not just another book on MvR. It reshapes our understanding of him, revealing a wounded young man, far from invincible, and a nurse whose compassion and diligence preserved him through weeks of uncertainty. In doing so, the book enriches both the historiography of von Richthofen and the broader history of the Great War's human dimension.

Carl J. Bobrow, Quondam Alfred Verville Fellow, National Air and Space Museum

Wings Over Italy: The Story of Flight Sergeant Dennis Varey and 260 Squadron from El Alamein to the Liberation of Europe. By Paul L. Dawson. Barnsley UK: Air World, 2025. Photographs. Bibliography. Pp. 246. $49.95. ISBN: 978-1-03613-578-2

Dawson's *Wings Over Italy* is far more than a ghostwritten wartime memoir. It is a deeply researched, sensitively written, and elegantly constructed portrait of a generation of men who carried the Royal Air Force's Desert Air Force from the burning sands of North Africa to the mountainous battlefields of Italy and, finally, to victory in Europe. While the book is nominally the story of Dawson's uncle—a World War II RAF sergeant pilot—it transcends the usual limits of personal reminiscence to become a vivid and authoritative narrative of a campaign often overlooked in favor of the battles in Western Europe.

At its heart, the book follows the experiences of Dawson's uncle from his early days in flight training through the ceaseless combat operations that marked the Desert Air Force's long and grinding advance. Dawson uses his uncle's recollections as both compass and color, weaving personal memory into a broader, coherent history of the RAF's operations from the deserts of Egypt and Libya to the invasion of Sicily and the push up the Italian peninsula. The result is not only an intimate record of one pilot's war, but also a masterful evocation of the collective experience of the men who flew, fought, and often died far from home.

To enrich his storytelling, Dawson incorporates first-person accounts from other members of his uncle's squadrons, lending the narrative breadth and depth. In many moving passages, he recounts the final missions of these airmen and records their final resting places with a poignancy that reminds the reader of the price paid for each mile of Allied advance.

The book also offers valuable insight into what personal memoirs can contribute to military history. Dawson reminds us that the combatant's memories capture what mattered to the participant, not necessarily what later seemed important to historians. Thus, his uncle recalls not only the tactics of air combat but also the frustrations of living in tents; the slow, cumbersome act of retracting a P-40 landing gear; or the numbing fatigue of endless operations. Dawson deftly uses these personal textures to animate his broader historical account, giving life and immediacy to the campaign.

In the concluding chapter, Dawson ventures beyond narrative into thoughtful historical analysis. He challenges the conventional view that the Mediterranean campaign merely served to tie down Axis forces away from the Eastern Front and the Atlantic Wall. Instead, he questions whether the Allied commitment of men and matériel to Italy diverted strength that might have shortened the war elsewhere. Here, too, he recalls Lady Nancy Astor—the Jane Fonda of her time—whose derisive label "D-Day Dodgers" unfairly minimized the courage and sacrifice of those who fought in Italy.

Dawson's writing is distinguished by its flexibility and grace. He moves effortlessly between the deeply personal and the coolly analytical, giving attention both to the men and to their machines. His uncle's candid assessments of the P-40, Hurricane, and Mustang will delight aviation enthusiasts; while his reflections on the hazards of fighter-bomber operations offer fresh perspective—especially his provocative argument that ground-support flying was more dangerous than bombing Berlin.

Wings Over Italy is a superbly written, deeply humane, and intellectually engaging book. For anyone interested in World War II aviation or the Mediterranean theater, it deserves the highest recommendation.

Gary Connor, docent, National Packard Museum

Harrier GR 7/9 Units in Combat. By Michael Napier. Oxford UK: Osprey Publishing, 2025. Photographs. Illustrations. Tables. Appendices. Index. Pp. 96. $25.00. ISBN: 978-1-47285761-3

Napier is a former RAF Tornado GR 1 and commercial airline pilot. He has authored 14 books on both military and aviation history. In his latest work, he explains that aircraft can become "iconic" for any number of reasons: uniqueness, ubiquity across years and conflicts, evolution in power and performance, or sustained utility. This book is a concise look at the Harrier GR 7/9's operational history in the Royal Air Force (RAF). It illustrates why the Harrier in general, and the GR 7/9 in particular, are iconic.

In response to a NATO specification for a light tactical-support fighter, Hawker Siddeley proposed the P.1127. The aircraft, originally named Kestrel, was unique in that it incorporated the radical Bristol Pegasus vectored-thrust engine. The Mk 101/102 engine enabled vertical take-off and landing (VTOL) and short take-off and vertical landing (STOVL) capability, greatly expanding available operating areas. The ability to essentially operate anywhere led to the sobriquet "jump jet."

The first production version (GR 1), now named Harrier, entered service in July 1969. This design of the Harrier persisted through the GR 3. Upgrades included more powerful engines, radar warning receivers, laser range finders, and target designators. The need for greater range and payload led to the GR 5/7/9 (Harrier II), a major redesign of the Harrier. GR 5s featured a larger wing employing composite materials and a new fuselage made extensively of composites, enabling increased payload or range. GR 7s incorporated the more powerful Pegasus Mk 107 engine, forward looking infrared systems, and cockpits compatible with night-vision goggles. The final version, GR 9, added a new computer weapons system and an advanced targeting pod to support use of the most advanced close support weapons, such as the Maverick, Hellfire, and Paveway IV. The RAF Harrier fleet was operational through 2011.

The six chapters of the book are short but packed with detail. While the beginning focuses on Harrier development from the GR 1 to the GR 7/9, the remaining chapters focus wholly on operational history: enforcing the no-fly zone over northern Iraq, action in Belize, Balkan operations, and Afghanistan missions. Each covers the background of a specific conflict, the Harrier's role, and first-hand accounts from the pilots. Especially interesting was the creation of Joint Force Harrier in 2000. This force combined Royal Navy (RN) Sea Harrier FA 2 and RAF Harrier GR 7 units into a unified force aboard the Royal Navy aircraft carriers for force projection and deterrence. RAF pilots had to complete an eight-day, five-sortie syllabus to qualify for aircraft carrier operations. The color photographs throughout vary in level of detail from individual aircraft to action photographs. The captions tie in with the narrative and clearly explain each scene. There are 24 color aircraft profiles illustrating paint schemes and markings of various Harrier GR 7/9s. Each profile caption is expanded in the appendix.

This is a concise look at the GR 7/9's operational history and is a definite read for anyone wanting a better understanding of the Harrier's post-Falklands career. It's a great account of an iconic aircraft and the aircrews who pushed it to its limits. Napier's insider RAF knowledge and the wealth of personal accounts make this more than just a history book. It's a genuine tribute to the "jump jet."

Tim Hosek, USG (retired)

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Araguaia War: Counterinsurgency Operations Against the Communist Guerrilla in Brazil, 1967-1974 Volume 1: The Roots of Conflict: Brazil's Military Regime and Revolutionary Beginnings and **Volume 2: Counterinsurgency and Legacy: The Struggle for Control in Araguaia.** By Antonio Luis Sapienza. Warwick UK: Helion, both 2025. Maps. Tables. Illustrations. Photographs. Notes. Bibliography. Pp. 78 and 52, respectively. $29.95 each paperback. ISBN: 978-1-804515-75-4 and 978-1-804517-88-8 respectively

Sapienza is a retired Paraguayan English teacher and aviation historian. He has written over 500 articles and published 27 books during the past 30 years. This set is his 14th publication for Helion. As a South American and very able researcher, he is well qualified to address the many military actions throughout the continent.

As long-term readers of the *AFHF Journal* reviews may have noticed, I am a fan of both Helion and of books on smaller military actions throughout the world. There are lessons to be learned in these conflicts.

This conflict originated with the Brazilian military coup that seized power in 1964—a government backed by the US. Understandably, not all of the population accepted the change in government. Sapienza describes 15 leftist organizations that opposed military rule; the Communists were the most powerful of these. They envisioned a revolutionary movement along the lines of those of Mao and Castro. An armed opposition force was gradually established deep in the Brazilian jungle along the Araguaia River, where there were already tensions between locals and government-backed mining operations in the area. For the first few years, the movement's attempts to win over the hearts and minds of people and spread dissent stayed below the Government's radar.

Volume 1 is an excellent study of the background and foundations of the anti-government movement and its players. It also gives an exceptionally detailed overview of the Brazilian military organization and capabilities. Volume 2 describes the operations conducted to identify, engage, and eventually wipe out the movement. Interestingly, the government wanted this whole uprising kept under wraps and went to great extremes to obfuscate operations in 1972-74 and, when it was over in 1974, to erase all evidence that it even happened. Sapienza had to overcome the lack of documentation in order to write this outstanding coverage of the period.

Airpower was used much as it was in South Vietnam (there are great similarities between the two conflicts, albeit Brazil was a far-smaller-scale war). An interesting collection of aircraft provided transport of troops and supplies (C-47s, UH-1s, and DHC Caribous), reconnaissance and FAC work (Stinson L-9s, Bell 47s and 206s, and Cessna L-19s), sea surveillance to prevent arms shipments (P-2 Neptunes), and attack missions (T-6 Texans). Often, these aircraft served without military markings, civilian registrations having replaced them.

Though primarily a small-unit ground war, it could not have taken place without airpower support. On the ground, it was a rather nasty conflict. Torture was freely employed on captured guerillas. These people then just disappeared. Eventually bodies were burned in the jungle, military records were destroyed, and all engaged just didn't talk about it. But one good thing was accomplished: during the period, the military performed more civil actions that resulted in improvements to the lives of the locals than were ever accomplished by the limited number of ill-equipped guerillas. Many locals turned on them and helped bring them down.

These volumes are typical Helion: well-documented; loaded with maps, photos, and illustrations of the aircraft used; and superbly edited and laid out. For those interested in the turmoil of South American politics and one of the many small conflicts on that continent, this two-volume story is an excellent read.

Col Scott A. Willey, USAF (Ret), Book Review Editor, and former National Air and Space Museum docent

Airpower Over the Rhine: The Luftwaffe, the French Air Force, and the Battle of France. By James F. Slaughter III. Annapolis MD: Naval Institute Press, 2025. Index. Bibliography. Maps. Photographs. Tables. Notes. Pp. 253. $34.95. ISBN: 978-1-68247794-6

Slaughter's book significantly contributes to the historiography of early–Second World War European airpower. It is also a model example of how a doctoral dissertation can be successfully transformed into a first-rate scholarly book. Too often, works that originate in academia retain the stiffness, over-signposting, or inward focus of their dissertation roots. This study avoids these pitfalls entirely. Instead, it demonstrates how rigorous research, deep archival immersion, and careful citation can coexist with clarity, narrative momentum, and genuine readability. As such, it deserves attention not only from students of airpower and the 1940 campaign, but also from anyone interested in how serious academic history should be presented to a wider audience.

At its core, the book examines the catastrophic failure of French airpower—and, by extension, French military leadership—to defend France against the German Blitzkrieg in the summer of 1940. Slaughter characterizes this defeat broadly as a failure of leadership, but he does not allow the term to remain a vague or convenient abstraction. Instead, he carefully dissects its components: doctrinal rigidity, institutional complacency, and a loss of strategic focus in the face of an increasingly obvious German threat. He builds a persuasive, often damning, case against senior leaders within the French Air Force, showing how their inability to adapt doctrine and prioritize modernization fatally undermined operational effectiveness.

Crucially, Slaughter extends his analysis beyond purely military explanations to examine the broader political and social environment. Deep political polarization of interwar French society—particularly the Left's growing influence within political and industrial institutions—complicated and obstructed coherent modernization of both tactics and equipment. This wider analytical framework strengthens the book, setting military failure within systemic dysfunction rather than reducing it to technical or organizational shortcomings alone.

One of the book's greatest strengths is its extensive use of period French sources. These reveal, with uncomfortable clarity, that French aviation entered the war six-to-eight years behind the German in doctrine, organization, and operational thinking. Slaughter contrasts this stagnation with Germany's energetic incorporation of lessons learned during the Spanish Civil War, a critical proving ground for Luftwaffe tactics and command practices prior to 1939. The result was not merely superior aircraft, but a more adaptable and operationally integrated air arm that worked closely with its army counterparts.

The book is never a blanket indictment. Slaughter consistently reserves his sharpest criticism for senior leadership while offering well-earned praise for French aircrews and support personnel. These men inflicted heavy losses on German forces—losses the Luftwaffe could ill afford: Germany's shortage of trained and experienced aircrews became increasingly evident during the Battle of Britain and *Barbarossa*, The Luftwaffe was already losing the war of attrition well before the first American aircraft crossed the Atlantic.

In sum, this is an outstanding study of an under-examined phase of the European war. Meticulously researched, clearly argued, and admirably written, *Airpower Over the Rhine* places both blame and credit exactly where they belong. I highly recommend it both as an important work of airpower history and as a textbook example of how a dissertation can be turned into a first-rate book.

Gary Connor, docent, National Packard Museum

PROSPECTIVE REVIEWERS

Anyone who believes he or she is qualified to substantively assess books for the journal should contact our Book Review Editor for a list of books available and instructions. The Editor can be contacted at:

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Compiled by
George W. Cully

March 11-13, 2026
The **American Astronautical Society** will offer its 63rd annual Goddard Space Science Symposium. For more details as they become available, see the Society's website at Goddard Space Science Symposium | American Astronautical Society.

March 13-14, 2026
The **National World War II Museum** in New Orleans, Louisiana will present a symposium entitled "Patton - Man of War." The presentation schedule promises a detailed look at one of the War's most famous and controversial commanders, his life, service and legacy in the postwar world. For registration, see the Museum's website at Conferences & Symposia | The National WWII Museum | New Orleans.

March 26-29, 2026
The **Society for Military History** will offer its annual meeting in Arlington, Virginia. For more details as they become available, see the Society's website at 2026 Annual Meeting | The Society for Military History.

April 13-16, 2026
The **Space Foundation** will host its 41st annual Space Symposium at the Broadmoor Hotel in Colorado Springs, Colorado. It's billed as "the premier event uniting global space professionals from all sectors." For registration and a program of events, see the Foundation's website at 40th Space Symposium - Registration is now open!

April 16-19, 2026
The **Organization of American Historians** will hold its annual conference at the Philadelphia Marriott Downtown Hotel in Philadelphia, Pennsylvania. The theme of this year's gathering is "Rethinking American History at 250." For further details, see the Organization's website at OAH | 2026 OAH Conference on American History.

May 13, 2026
The **Air Force Historical Foundation** will host its latest Symposium at the Air Force Association's Headquarters Center in Crystal City, Virginia. The theme of this year's Symposium is "Unmanned Air & Space Flight, 1915-2025." For registration and other details, see the Foundation's website at https://afhistory.org/wp-content/uploads/2025/11/AFHF-SYMPOSIUM-PRESENTATION-PROPOSAL-and-REGISTRATION-for-2026.pdf.

May 14, 2026
The **Air Force Historical Foundation** Awards Banquet, 6:00PM-9:00PM, To be held at the Udvar-Hazy Center, Chantilly, VA.. For details go to afhistory.org/events

May 14-15, 2026
The **Society for History in the Federal Government** will present its annual meeting in the Library of Congress' James Madison Memorial Building in Washington, DC. For registration see the Society's website at Society for History in the Federal Government - 2026 Annual Meeting.

July 8-12, 2026
The International Women's Pilot Association, better known as **The Ninety-Nines**, will hold its annual international conference at the Westin San Diego in San Diego, California. Registration deadline for the meeting is May 31. For details, see their website at 99s International Conference & Career Panel 2026 - San Diego, California.

July 13-16, 2026
The **History of Science Society** will cohost its 2026 meeting in partnership with the European Society for the History of Science. Their meeting is set to be held at the University of Edinburgh in Edinburgh, Scotland, and the conference theme will be "Shifting Perspectives: Plural Worlds, Contested Sciences." For further information, see the Society's website at 2025 HSS Annual Meeting - History of Science Society.

August 20-22, 2026
The **Tailhook Association** will host its annual premier naval aviation reunion and symposium at the Grand Sierra Resort Hotel in Reno, Nevada. For reservations and more information, reach out to the Association at The Tailhook Association | 9696 Business Park Avenue, San Diego, CA, USA.

September 12-13, 2026
The **Air & Space Forces Association** will offer its annual meeting at the Gaylord National Resort and Convention Center in National Harbor, Maryland. For registration, see the Association's website at 2026 National Convention - Air & Space Forces Association.

September 16-19, 2026
The **National Council on Public History** will cohost its annual meeting with the American Association for State and Local History at the Rhode Island Convention Center in Providence, Rhode Island. The theme of this year's meeting will be "The Work of Revolution." For more information as it becomes available, see the Council's website at 2026 Annual Meeting | National Council on Public History.

September 23-26, 2026
The **Society of Experimental Test Pilots** will hold its 70th annual symposium and banquet at the Grand Californian Hotel in Anaheim, California. For presentation proposals and other details, see the Society's website at 70th Annual Symposium & Banquet - Call for Abstracts | Annual Symposium & Banquet | Symposium/Meetings.

October 14-17, 2026
The **Oral History Association** will host its annual meeting in Portland, Oregon. The Association recently issued a call for paper proposals for this event; see their website for details at Annual Meeting - Oral History Association.

Readers are invited to submit listings of upcoming events Please include the name of the organization, title of the event, dates and location of where it will be held, as well as contact information. Send listings to:

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Montgomery, AL 36106
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E-mail: warty0001@gmail.com

Answer: On December 21, 1926**,** with a motto of "No work, No Ride," ten Air Corps aviators took off from Kelly Field, San Antonio, Texas on the Pan American Good Will Flight. With the purpose of delivering messages of friendship from President Coolidge and promote aviation, the Good Will Flight effectively few a lap around Latin America, South America, including stops the Caribbean. Flying five amphibious Loening OA-1A aircraft, the aviators visited 29 countries and Caribbean Islands. The Leoning OA-1A were named after the U.S. cities: New York, San Antonio, San Francisco, Detroit, and St. Louis. Tragically, the New York and Detroit collided over Argentina, killing Capt. Clinton Woolsey, Lt. John Benton flying in the Detroit. After travelling over 22,000 miles, the flight ended at Bolling Field in Washington DC on May 2, 1927 were met by President Calvin Coolidge. The flight would be awarded the MacKay Trophy for the most meritorious flight of 1926. For their accomplishment, the aviators were the first to receive the Distinguished Flying Cross. Several of the pilots went on to become general officers during World War II.

To Learn more:

Summary of the flight: https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196945/pan-american-good-will-flight/#:~:text=The%20mission%20of%20the%20Pan,navigation%20routes%20through%20the%20Americas
The Story of the Flight: https://www.afdw.af.mil/News/Features/Display/Article/336357/may-2-1927-the-story-of-the-pan-american-flight/
The flight's official Report: https://media.defense.gov/2010/Dec/03/2001329909/-1/-1/0/AFD-101203-020.pdf

Mission Commander Herbert Dargue: https://media.defense.gov/2010/Dec/03/2001329909/-1/-1/0/AFD-101203-020.pdf
Ira Eaker: https://apps.dtic.mil/sti/pdfs/ADA376708.pdf
Brigadier General Arthur Bee McDaniel: https://www.af.mil/About-Us/Biographies/Display/Article/2149541/brigadier-general-arthur-bee-mcdaniel/

New History Mystery

by Dan Simonsen

This Issue's Quiz:

Question: The 1920s was a decade of aviation advancements. The advancements included rapid aeronautical innovation (aerial refueling) and record-setting feats (transatlantic crossings, endurance flights, and long-distance military demonstrations). The United States (U.S. Navy, U.S. Army Air Service and later Army Air Corps) worked to showcase their respective growing aviation capabilities. In 1924, the Army's Air Service flew around the World. The four aircraft used in the around the world flight all carried the names of U.S. cities (Seattle, Boston, Chicago, and New Orleans). In 1926, Maj. Gen. Mason Patrick proposed another long distance goodwill flight with five aircraft. The aircrew for the flight include Air Force greats. Can you name the flight? Just like the around the world flight, the aircraft in this flight were named after U.S. cities. Can you name the cities and the type of aircraft used on the flight?

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