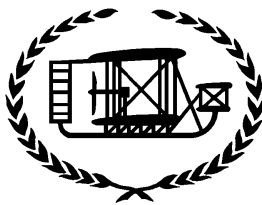


AIR POWER *History*

WINTER 2000 - Volume 47, Number 4

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The Journal of Air and Space History
(formerly *Aerospace Historian*)
Winter 2000 Volume 47 Number 4

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Bryce Poe II

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Air Power History (ISSN 1044-016X)
is produced in March, June, September,
and December by the Air Force Historical
Foundation.

Prospective contributors should consult the
GUIDELINES FOR CONTRIBUTORS at
the back of this journal. Unsolicited manu-
scripts will be returned only on specific
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uscript. The Editor reserves the right to
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Periodicals postage paid at Lexington, VA
24450 and additional mailing offices.

Postmaster: Please send change of
address to the Circulation Office.

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This issue's lead article, A "Pretty Damn Able Commander," by Roger G. Miller, a frequent contributor to *Air Power History*, fleshes out the life of Lewis H. Brereton, one of our most colorful and controversial air commanders in World War II. Using previously overlooked sources, Dr. Miller resuscitates the memory of this nearly forgotten officer. This is part I of a two-part series, to be continued in the Spring of 2001.

In "Navy Buys Computer, Discovers Reliability: A Personal Account," Dr. John Coutinho relates how the U.S. Navy adopted the new discipline of reliability engineering. His article demonstrates how the Navy's leadership managed to persuade all involved, including the aerospace industry and government bureaucracy, that reliability engineering extended the power of design control and was not just another passing fad.

Viktor P. Kulikov, a Russian air power enthusiast, uses recently released archival materials to evaluate the performance of Igor Sikorsky's fighter plane designs during World War I and their demise in the 1920s. Future issues of *Air Power History* will feature Mr. Kulikov's accounts of Vladimir Lebedev, Russian ship-based aircraft, and British aircraft in Russia.

World War II veterans, Ralph H. Saltsman and Robert L. Ferguson, Jr. describe what it was like on two days at Guadalcanal — September 14 and November 11, 1942. They recount the heroic exploits of the 67th Fighter Squadron "Fighting Cocks" at Bloody Ridge and afterward.

Brig. Gen. Brian S. Gunderson, USAF (Ret.), another World War II veteran and a major contributor to the Air Force Historical Foundation's and *Air Power History's* success, launches the first installment of his dictionary of wartime slang terms, which he calls "Slanguage."

While there are only a handful of book reviews in this issue—our lowest number in years—the books received list is bulging. Book review editor, Michael Grumelli, is actively soliciting new reviewers. If you feel qualified to review one or more of the books listed—in this or prior issues, or have an appropriate book that was not listed—please contact Dr. Grumelli. See page 64.

The departments section includes the usual categories of "The History Mystery," letters, news, notices, and reunions. If you would like to express your views or advise readers of some upcoming event, please write or e-mail the editors. See pages 2, 64, 68, and 70. Also, notice our new advertising address on page 2.

As a token of gratitude to our anonymous reviewers, we list their names on page 75.

Gen. W. Y. Smith, USAF (Ret.), president of the Air Force Historical Foundation, reports on the Foundation's extremely active year and plans for a busy 2001. His report appears on page .

On behalf of the entire staff of *Air Power History*, I wish all of our readers happy holidays, health, and good fortune.



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A “Pretty Damn Able Commander” Lewis Hyde Brereton: Part I





Roger G. Miller

(Overleaf) Second (Red) Army anti-aircraft guns firing on Third (Blue) Army Douglas A-20 Havoc attack aircraft outside Nacogdoches, Texas, during the Louisiana Maneuvers, September 16, 1941. (National Archives.)

BRERETON'S NAME FADED RAPIDLY FROM PUBLIC MEMORY

HE IS AGGRESSIVE AND QUICK IN SIZING UP A TACTICAL AND STRATEGIC SITUATION AND HE CAN BE FRANK TO THE POINT OF TACTLESSNESS

On the early afternoon of Tuesday, November 4, 1941, the pulsing drone of aircraft engines pierced the quiet air over Manila, capital city of the Philippine Islands, treating local citizens to a spectacular sight. One after the other, in vees of three, forty-two Curtiss P-40 and Seversky P-35 pursuit aircraft passed over the city, while twin-engine Douglas B-18s and four-engine Boeing B-17s flew high above the fighters. It was a dramatic display of the rapidly expanding air power in the islands, and of its kind, the last. One observer, Capt. Allison Ind, later wrote, "We were never again to see so many friendly airplanes over Manila."¹ The armada of aircraft formed a welcoming committee for the Pan American Clipper flying boat due in from the United States after a delayed trip across the Pacific Ocean. Great expectations accompanied the Clipper, for it carried the new commanding general of what would soon be designated Far East Air Force, a brusque, feisty experienced airman, Maj. Gen. Lewis Hyde Brereton.²

The officer who emerged from the flying boat presented a compact figure of less-than-medium height. Despite spectacles—a rarity among air officers that gave him a somewhat professorial air—Brereton exuded military polish. He dressed immaculately, carried himself with soldierly bearing, and walked with a quick, impatient step that would prompt British officers in North Africa to nickname him "Hot foot Louie." His speech was clear and pungent, and often as not he expressed himself in staccato bursts of words liberally laced with profanity. Captain Ind described the general as "a square-rigged, stout hulled believer in action"³ and found him blunt, assertive, and pugnacious: "Clipped and final were his sentences, sweeping were his concepts, and sudden were his decisions."⁴ *New York Times* military correspondent Hanson Baldwin wrote that Brereton was "dynamic to the point of exhaustion," and that he personified a "reckless, restless vigor."⁵ Brereton was social and convivial, had an eye for the ladies, and enjoyed the prerogatives of his rank. When roused, he displayed a fierce temper. "Louie' Brereton pulls no punches," Baldwin concluded; "he is aggressive and quick in sizing up a tactical and strategic situation and he can be frank to the point of tactlessness."⁶ Unfortunately, the next seven months would provide the general with an abundance of opportunity for tactlessness, temper, and profanity.

During World War II, Lewis Brereton earned a number of distinctions. He was one of the few senior American commanders who served in combat theaters continuously from the bombing of Pearl Harbor to the German surrender, and he saw

action in more theaters, perhaps, than any other senior officer. He began the war as commander of Far East Air Force (FEAF) until driven out of the Philippines, then took the remnants of his force south where he served as deputy air commander in the short-lived American-British-Dutch-Australian Command (ABDACOM). When ABDACOM collapsed and Java fell, Brereton flew to India where he took command of the newly formed Tenth Air Force and participated in the fighting in Burma and the Indian Ocean. When Gen. Erwin Rommel drove British forces in North Africa almost to Cairo in the early summer of 1942, the War Department ordered Brereton to Egypt where he organized Ninth Air Force. In late 1943, he moved to England where he reconstituted Ninth as a tactical air force to support the invasion of Europe. And in mid-1944, he assumed command of First Allied Airborne Army, a unique experiment that combined British and American airborne divisions and air transport units into a single organization. Along the way, Brereton was involved in several of the most debated events of the war, including the destruction of much of FEAF on the ground in the Philippines, Operation Tidalwave, the low-level attack on the Ploesti oil production facilities; Operation Cobra, the breakout from Normandy; and Operation Market-Garden, the airborne assault in Holland. Shortly after the war, Baldwin would justly describe him as "one of the Air Forces' best known and most controversial figures."⁷

Despite this extensive résumé, however, Brereton's name faded rapidly from public memory, and he is remembered today primarily because he wrote *The Brereton Diaries*, a standard source for historians of the air war. *The Brereton Diaries* and an article, "Faded Reputation: Brereton of the Allied Airborne Army," by Roger A. Beaumont are virtually the only historical pieces devoted specifically to Brereton. *The Brereton Diaries* has the built-in biases of a first person account and also fails to reflect Brereton's dynamic personality.⁸ Beaumont's article contends that Brereton was one of William "Billy" Mitchell's key disciples and an expert on aerial bombing, and that his ultimate disappearance from public awareness was a kind of punishment—almost Shakespearean in irony—for his association with the flamboyant advocate of strategic bombardment.⁹ Most histories of World War II and especially those recounting the campaigns in Europe in 1944-1945 mention Brereton, and some have reasonably thorough depictions of his actions, usually based upon *The Brereton Diaries*. Otherwise, a handful of contemporary articles round out the secondary works available on Brereton.¹⁰ These provide, at best, an uneven, incomplete view of the general.

Roger G. Miller is a historian with the Air Force History Support Office at Bolling AFB, Washington, D.C. He is currently writing a history of air logistics from the Mexican border to the Persian Gulf. His articles have appeared in *Air Power History*, *The Indiana Magazine of History*, *Military Affairs*, *Prologue*, and *The Air Force Journal of Logistics*. Dr. Miller's book, *To Save a City: The Berlin Airlift, 1949-1949*, was recently published by Texas A&M Press.



1st Lt. Lewis H. Brereton in full flying regalia at the Signal Corps Aviation School at North Island, California, c. 1913. (201 File, Lewis Hyde Brereton, Military Personnel Records, National Personnel Records Center, St. Louis, Missouri.)

OPINIONS
ABOUT THE
GENERAL
VARY DRA-
MATICALLY

A MORE
DETAILED
EVALUATION
OF
BRERETON
AND HIS
BACK-
GROUND
WOULD BE
OF GREAT
INTEREST

A survey of secondary literature suggests the following. First, opinions about the general vary dramatically. As in the case of colorful figures like Clair L. Chennault, George Patton, Curtis LeMay, and others, little room seems to exist for neutral opinions about Brereton's reputation. Second, earlier historians generally have had a more favorable view of his performance; more recent historians have given him less credit for ability. Third, and closely related to the previous point, historians who have tended to give Brereton higher marks for competence, especially concerning the events in the Philippines, have largely been those, like Robert F. Futrell and Richard L. Watson, who have written extensively on the history of air power. Fourth, an individual's view about Brereton's actions in the Philippines are generally the reverse of his view of Gen. of the Armies Douglas MacArthur. Pro-MacArthur historians tend to condemn Brereton; anti-MacArthur historians are generally pro-Brereton. Many of the most serious assaults on Brereton's reputation have thus originated from those who have risen to MacArthur's defense. An extreme example is provided by author Geoffrey Perret who presented a balanced portrayal of Brereton in his history of the U.S. Army Air Forces during World War II, *Winged Victory*, published in 1993. His biography of MacArthur, *Old Soldiers Never Die*, three years later, however, condemned Brereton both personally and for his role in the Japanese bombing of Clark Field on December 8. Perret accompanied this book with an article in *American Heritage* that included a venomous attack on Brereton's ability and integrity. William H. Bartsch has effectively responded to Perret's condemnation of Brereton, as well as to other misinterpretations of the events in the Philippines in 1941 that appear in *Old Soldiers*, so there is little reason to do so here; however, it is clear that a more detailed evaluation of Brereton and his background would be of great interest.¹¹

Comparatively few primary historical resources are available on Brereton. Most important, a major collection of personal papers has yet to be found. Brereton was divorced twice, moved often like all servicemen, and appears to have been something less than a "pack rat." The personal and professional papers that might have proven attractive to a biographer appear to have disappeared. Further, despite his ubiquity, Brereton was one of the less prominent commanders of the war, and he passed away in 1967, before historians began exploring lesser known air leaders such as Elwood "Pete" Quesada, Hoyt Vandenberg, and Kenneth Walker. By the time Murray Green, D. Clayton James, DeWitt S. Copp, and other authors began conducting extensive interviews with participants in the war, Brereton had passed away.¹² Otherwise, a handful of official documents scattered through many archives, reminiscences by veterans, and some obituaries round out the primary sources available. Doing research on Brereton is thus less like mining a vein of gold and more like scavenging a beach for unbroken sea shells following a hurricane. One exception to the above exists. Brereton's official personnel file has been ignored by or was unavailable to previous historians. Some six inches thick, it provides the only extensive collection of material that covers Brereton's military career. The great advantage of this document is that, with few exceptions it includes the "who," "what," "when," and "where" of the historical equation. The great disadvantage is that it seldom answers the "why" part of the formula.

This study represents an effort to correct misconceptions about Lewis Brereton that have entered the public record and to present a more comprehensive picture of his life. Part I explores his experience prior to World War II; Part II concentrates on his experiences during the first seven months of the war. Future work will be necessary to assess his proper role and stature during the campaigns in North Africa and Europe, although some preliminary comments on these events will be included where appropriate.

Lewis Brereton was the second of two sons in a small, upper-middle class family. His father, William Denny Brereton, was born in Pittsburgh, Pennsylvania, in 1861, became a successful mining engineer, and married Helen Hyde, an indulgent, fun loving English woman. Their eldest son, William Denny Jr., was born on December 15, 1886, in Globe, Arizona. By the time Lewis Hyde was born on June 21, 1890, however, the family had returned to Pittsburgh. In 1904, Lewis's brother entered the U.S. Naval Academy, and William Sr.—who either had already retired or chose this occasion to retire—moved his family to Annapolis, Maryland. The second floor of their frame house at 202 King George Street still overlooks the Academy grounds. According to a 1942 interview with journalist Clare Boothe Luce, Lewis Brereton inherited his father's temper, analytical mind, and sense of humor and his mother's enjoyment of parties and fun. The Brereton home

HIS PERFORMANCE AT THE ACADEMY ALSO SUGGESTS A SOMEWHAT LACKADAISICAL ATTITUDE AND CERTAIN DISREGARD FOR RULES AND DISCIPLINE

BRERETON LEFT NOTHING IN WRITING TO EXPLAIN THE ORIGINS OF HIS INTEREST IN AVIATION

was remembered for many years as a popular rendezvous. While his brother attended the Academy, Lewis studied at St. John's College in Annapolis, graduating in 1907. Brereton, in later years, recounted that his real goal was to enter the U.S. Military Academy at West Point. Unable to obtain an appointment, however, he followed William into the Naval Academy along with 293 other midshipmen on July 16, 1907.¹³

Brereton's performance at Annapolis was unexceptional. He stood 58th in order of general merit out of 194 graduates, just finishing in the upper third of his class. His highest academic standing was 10th in law, his lowest was 94th in navigation.¹⁴ Evidence concerning Brereton's personality at the time is limited. His nickname was "Louis"—pronounced "Looie," as it occasionally would be spelled later—which suggests a somewhat informal and congenial nature. The 1911 Naval Academy yearbook described him as "a fine fellow in every way, and a staunch friend," and credited him with reading a great deal and arguing with anyone about the affairs of the day.¹⁵ His performance at the Academy also suggests a somewhat lackadaisical attitude and certain disregard for rules and discipline. Brereton later told Luce that his performance was distinguished only by the amount of time he spent in confinement. Brereton stood 139th in efficiency and 149th in conduct, near the bottom of his class in both categories.¹⁶

On March 6, 1911, Brereton resigned from the U.S. Navy effective on his graduation from the Academy. In later years, rumor said that he left the navy because of seasickness, while another story—apparently circulated by Brereton—was that in 1911 the army had a shortage of second lieutenants while the navy had a surplus of ensigns, thus he could join the service he had always preferred.¹⁷ Brereton was somewhat disingenuous in his *Diaries* when he wrote that he had "never been seasick since I left Annapolis."¹⁸ He *had* been sick while at Annapolis. "When at sea I am continually subject to seasickness," he wrote in his letter of resignation.¹⁹ The problem was medical. Beginning at the age of eight, Brereton had suffered recurring bouts of "purulent otitis media," an infection of the middle ear almost impossible to treat prior to the advent of antibiotics. Mention in his medical records of an "old perforation" implies that he had received permanent damage to the eardrum at an early age. The most serious damage may have taken place later, however, since his first physical examination at the Academy found his hearing to be excellent. Late in 1908, Brereton experienced chronic inflammation of his left middle ear that rendered him unfit for duty for several weeks. Subsequent examinations confirmed a loss of hearing, and on March 9, 1911, the Permanent Medical Examining Board rejected Brereton for active service. The U.S. Navy accepted his resignation on June 5.²⁰

On August 17, 1911, former Midshipman Brereton received a commission as second lieutenant in the U.S. Army Coast Artillery Corps

(C.A.C.). Brereton accepted on September 6 and reported to the 118th Company at Fort Monroe, Virginia. Subsequently, in March 1912, Brereton joined the 17th Company, C.A.C., at Fort Washington, Maryland. The Coast Artillery, with its emphasis on the esoteric mathematics of ballistics, joined Ordnance and Engineers in being one of its most technically sophisticated branches of the U.S. Army. Service with the huge coastal artillery pieces was thus a natural for a refugee from the "big gun" navy. It also may have been judged appropriate for an officer with a hearing problem. In any case, Brereton fit in well in his new assignment. Evaluations commended his excellent attention to duty and professional zeal, complimented his military appearance and intelligence, and commended his ability as an instructor for enlisted personnel. His earliest evaluations began a long series that suggested Brereton was at his best commanding troops.²¹

Brereton left nothing in writing to explain the origins of his interest in aviation. The location of Fort Washington outside Washington, D.C., and the presence of the U.S. Army's first aviation school at nearby College Park, Maryland, however, may provide a connection. Be that as it may, Brereton received orders to join the Aviation Section of the Signal Corps on September 3, 1912. He, Lewis E. Goodier, Jr., Loren H. Call, Joseph D. Park, Eric L. Ellington, and William C. Sherman were the first five officers to report to the new Signal Corps Aviation School on North Island near San Diego, California, a site selected because pioneer airplane manufacturer Glenn Curtiss had a flying school at that location. Initially, Brereton received instruction from famed Curtiss exhibition pilot, Lincoln Beachey. The facilities at North Island, however, were inadequate and Brereton accomplished most of his training at the Curtiss factory in Hammondsport, New York, where he received about one hundred hours of instruction from Lansing Callan, three hours in flying boats from Francis "Doc" Wildman, and additional training from John D. Cooper and Beckwith Havens. Brereton passed the required test on March 27, 1913, and was one of the first fourteen army pilots to receive the newly-established Military Aviator badge. He returned to North Island where he was placed in charge of demonstrating how to pilot flying boats.²²

Brereton's aviation career was short-lived, however. On April 8, 1913, he was flying a Curtiss F flying boat, Signal Corps. No. 15, with Lt. Rex Chandler. The wind was strong and gusting out of the ravines off Port Loma. Flying with the wind, Brereton banked to the right. A gust of wind struck the aircraft forcing it into a steeper turn and the flying boat crashed into the bay. Brereton was thrown clear when the fuselage split, however, the engine hit Chandler on the head, and he drowned before rescuers arrived. Brereton returned to flying status in early May, but had a similar experience on May 21 as a passenger. This time both he and pilot John D. Cooper, were thrown clear. Two



The Signal Corps purchased two Curtiss model F flying boats, Nos. 15 and 34. Brereton learned to fly this type of aircraft at the Curtiss factory in Hammondsport, New York, and was placed in charge of demonstrating them when he returned to North Island. Brereton flew U.S. Army amphibians as late as 1935 while air commander in the Panama Canal Zone.

crashes provided sufficient warning, and Brereton requested relief from aviation duty based upon his approaching marriage and his father's concerns. This decision deserves comment. Neither his contemporaries nor historians have questioned Brereton's courage. Early flying was extremely dangerous, accidents occurred frequently, and requests for relief were not uncommon. Among the prewar airmen who exercised what should be considered reasonable discretion was the future commander of the U.S. Army Air Forces, Lt. Henry H. Arnold. The War Department released Brereton from aviation duties on July 3, 1913.²³

Through December 1915, Brereton served with the 115th Company, Coast Artillery Corps, at Fort Rosecrans, California. In 1913, he married Helen Willis of Milwaukee, Wisconsin; subsequently they had two children: a son, Lewis H. Brereton, Jr., and a daughter, Elizabeth. Garrison life at Fort Rosecrans was characterized by the endless grind of mundane peacetime service. His military education continued and Brereton scored high in examinations on infantry drill, coast artillery drill, field engineering, and topography. In his spare time, he played tennis and took up trap shooting. He had qualified as a sharpshooter in 1911 and by 1914 was recognized as a serious marksman and first

Brereton's 12th Aero Squadron entered combat in May 1918 flying obsolete, worn-out Avant Renault (A.R.) 1 two-seat aircraft similar to this one, which had been purchased from the French for observation training.



class pistol shot. In July 1916, the family arrived in the Philippine Islands where Brereton joined the 1st Company, C.A.C. at Fort Mills. While at Fort Mills, he developed an association with the 2d Aero Squadron, which operated at the same location. On September 16, 1916, Brereton requested reassignment to the Aviation Section of the Signal Corps. The War Department granted his request, but for reasons that are unclear, Brereton had to change his permanent branch of service. Accordingly, he took a formal examination that enabled him to switch from the Coast to the Field Artillery on January 13, 1917, and the army detached him for service with the 2d Aero Squadron. Brereton returned to the United States on March 18, 1917, and joined the Aviation Section headquarters in Washington, D.C., just as the United States entered World War I. Subsequently, he underwent flight training at the Signal Corps Aviation School at Mineola, New York, and on June 27 qualified as a Junior Military Aviator.²⁴

At Aviation Section headquarters, Brereton worked in the Equipment Division under pioneer military aviator Col. Benjamin D. Foulois, who was responsible for drafting a program for an expanded military air force capable of meeting the needs of an army of three million men. The \$640 million program received Congressional approval on July 24, 1917, and Foulois and his staff then set about implementation. It is unclear exactly what role Brereton played in this herculean effort, but the Equipment Division was heavily involved in identifying and procuring the thousands of pieces of equipment required by the flying fields being established across the United States. Foulois rated Brereton's performance as "very good," although he saw little aptitude for staff service and judged Brereton especially fit to command troops. In November 1917, newly promoted Brigadier General Foulois and a staff of some 100 officers sailed for France, where Foulois became Chief of the Air Service of the American Expeditionary Forces (AEF). Wearing the oak leaves of a major, Brereton found himself one of the few rated pilots and regular army officers in Foulois's entourage. Initially, Major Brereton was assigned to the Services of Supply at Variens, but he began his escape to the front in February 1918, when he reported to the Third Aviation Instruction Center at Issoudun—the Air Service's main flying training installation in France—for a month of advanced instruction.²⁵

Meanwhile, a new observation unit, the 12th Aero Squadron, had arrived in France. The 12th had been formed at Fort Sam Houston, but its men spent much of the succeeding months doing construction work at Kelly Field, Texas; Wright Field, Ohio; and at Amanty in France, where they built barracks and shops for the 1st Corps Aeronautical School, while its pilots trained at Issoudun and its observers gained experience flying with French observation units. Brereton found the 12th during an inspection trip. Learning of the squadron commander's preference for service with bombers, he

A relaxed Maj. Lewis Brereton leans against a Spad 11 observation aircraft. The others are 1st Lt. Arthur J. Coyle, Commander, 1st Aero Squadron, and two members of the Hearons Sisters YMCA Theatrical Troupe at Ourches, France, May 17, 1918. (National Archives.)



BRERETON FURTHER EARNED RESPECT FOR HIS WILLINGNESS TO CONFRONT OBSTINATE GROUND COMMANDERS

wangled orders that assigned himself to command the 12th and sent the former commander to the bombardment training school. Brereton now had a command, but no airplanes. After considerable lobbying, he secured twelve obsolete Avant Renault (A.R.) I two-seaters, a 1916 design long relegated to training duties. Brereton argued that his squadron could operate with these aircraft in a quiet sector as long as they had machine guns.²⁶ His men failed to appreciate his enthusiasm: "[T]here was noticeably keen disappointment when we found that we must fly over the front in these old, discarded and obsolete A.R.s," a veteran of the 12th recalled.²⁷ The 12th, however made the best of the A.R.s until June when it began receiving fast, heavily-armed Salmson 2A2s, perhaps the best Allied observation aircraft of the war. Additionally, Brereton announced that he wanted the 12th to specialize in "infantry contact" patrols, one of the most hazardous missions assigned to observation aircraft during World War I. The task required aircraft to locate the forward edge of the infantry battle, and often required flying within a few hundred feet of the ground, especially if the infantry failed to display their identification panels as they were supposed to do. At that altitude the lumbering two-seaters were "cold meat" for enemy pursuit aircraft, anti-aircraft guns, and

By mid-summer 1918, the fast, heavily-armed Salmson 2A2 aircraft powered by the 270 h.p. Canton-Unné water-cooled radial engine had replaced the 12th's obsolete A.R. 1s. Perhaps the best Allied observation aircraft of World War I, the Salmson was the A.E.F.'s standard corps observation aircraft. This one is having its fixed machine guns aligned and tested.



even rifle fire. The 12th moved to Ourches on May 3 and began flying operations on May 10.²⁸

When Lt. Elmer Haslett joined the 12th as an observer on May 3, 1918, he found it hard to believe that such a "pleasant-faced" young man could be so "hard boiled." Brereton kept him at attention while firing brusque, sharp questions. When he found that Haslett had only fifty-five minutes over the line, he ordered him back to school. Brereton's barrage of questions and needling comments had goaded Haslett to either "tears or blasphemy or both," however. Haslett angrily questioned whether or not Brereton had been over the lines, and pointed out that if he had, then he knew that the most important thing an observer needed was guts. "Brereton's response was a strong, ringing laugh," Haslett later wrote. "Damn it all my boy, maybe you're right. I haven't been over the lines myself yet."²⁹ Subsequently, Brereton flew the 12th Aero Squadron's first mission with Haslett as his observer.³⁰ Haslett frequently found Brereton infuriating, but grew to admire him—as did other officers and men of the 12th—for his willingness to do any job: "[H]e flew over the lines continuously and he never assigned any one to a mission that he would not do himself," Haslett later wrote. "He kept his remarkable hold on men for they knew he was a fighter from the word 'Go.'"³¹

Brereton further earned respect for his willingness to confront obstinate ground commanders. During one patrol, Haslett and another pilot had to descend to less than 100 meters in the teeth of a withering fire to locate infantry that had failed to display their identification panels. After they landed, Brereton drove them immediately to the brigade headquarters where they learned that the commander had refused to issue panels because the soldiers might get them dirty!³² According to Haslett:

Brereton began to cuss in great style and said that he would be blamed if he'd send his aviators out any more to be killed unless he got some cooperation from the Infantry and it was a terrible note when an all-important matter was pending and that if this Brigade wanted the Air Service to work with them they had better show some willingness to help.... The [visit] ended with the agreement that the panels would be issued immediately.³³

Brereton proved an observant leader who reported extensively on the problems faced by corps observation during the Château-Thierry offensive. In his view, failure of liaison with the infantry was a serious problem. Most troops, according to Brereton, were completely ignorant of Air Service matters. They ignored signals from U.S. aircraft and failed to display their signals properly. The principles of cooperation with aircraft must be second nature, Brereton pointed out, but the infantry divisions were not properly trained before they went into the lines. Brereton called attention to a similar problem with the

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OF THE FIRST
U.S. ARMY**

artillery. Corps artillery failed to notify the Air Service when it moved and there had been a breakdown in cooperation with divisional artillery, thus limiting its effectiveness. The artillery commanders corrected most problems as they were pointed out: "It was simply a question of learning, by bitter experience, a great deal that could be avoided in the future." Air Service radio equipment, he observed, was incapable of coping with the conditions that arose during the attack. Ground transportation was insufficient to meet essential group and squadron needs. Trucks could not be cannibalized or repaired because of the lack of parts and repair capability. Those that ran had to operate night and day, thus increasing the number of breakdowns. Enough replacement aircraft were available, he reported, but those received had not been properly inspected and adjusted by the replacement field at Orly. Pilots and observers were another matter. None had been received during the attack and attempts had been made by higher headquarters to divert some to other duties. The 12th lacked enough enlisted personnel to support a squadron of eighteen aircraft, and the squadron required twelve observers, not six.³⁴

As a tough, aggressive professional, Brereton quickly impressed Col. William "Billy" Mitchell, commander of the AEF's operational air units, who



Brig. Gen. William "Billy" Mitchell, Air Chief for Third Army, and his staff in Coblenz, Germany, following World War I. From left to right, Lt. Col. Lewis H. Brereton, Mitchell, Major Ira Joralemen, and Capt. O.E. Marrell. (National Archives.)

first noticed him during an inspection in May.³⁵ Mitchell needed "superior commanders" for the expanding Air Service and found most regular army officers unqualified, with some exceptions. "Colonel T[homas] D[eW]. Milling, of the regular army, one of our oldest pilots, has constantly attempted to get a command at the front," he wrote. "[Ralph] Royce has done well and Brereton, who has just come up with the 12th observation squadron appears to be a good man."³⁶ In July, the

2d Infantry Division attacked the village of Vaux near Chateau-Thierry and the 12th Aero Squadron adjusted artillery fire. Brereton and Haslett led the first missions and, according to Mitchell: "Due to their excellent observation work the City of Vaux was taken and completely destroyed by the artillery." Billy Mitchell judged the performance of the 12th under Brereton outstanding.³⁷

Brereton's maturity, experience, and growing expertise qualified him for higher positions in the AEF's rapidly expanding Air Service. On August 28, 1918, Mitchell appointed him commander of the Corps Observation Wing of the First U.S. Army, giving him responsibility for the observation groups assigned to the 1st, 4th, and 6th Corps, as well as an army observation group and a French army observation group, a total of twelve U.S. and seven French squadrons. Mitchell created this position to standardize and oversee the training and operations for air support of the First Army. The office was separate from that of the Air Service Commander for the Army, and was collocated with the headquarters of the First Pursuit Wing to better coordinate corps observation squadrons and the pursuit units that protected them. Mitchell required Brereton to inspect aerodromes thoroughly, ensuring that the units accomplished technical work correctly and that unit commanders maintained proper discipline. An important office at the beginning of the St. Mihiel attack, when many of the U.S. observation units were inexperienced, the office had pretty much worked itself out of business by the middle of the Meuse-Argonne campaign as the squadrons became veteran units.³⁸ Brereton took the assignment in the midst of active operations and, according to Mitchell, the young major "gave untiringly with never diminishing enthusiasm, his knowledge, experience and unusual organizing ability to the development of Corps Air Service organizations throughout the First American Army."³⁹ On October 25, 1918, Mitchell assumed command of the Air Service, Group of Armies, consisting of all Air Service units assigned or attached to First Army and newly-organized Second Army. Brereton served as his Operations Officer during the bloody fighting of the Meuse-Argonne Campaign, continuing his exemplary performance through the end of the war.⁴⁰

In addition to his expanded command responsibilities, Brereton continued to fly hazardous missions at every opportunity. On September 12, the first day of the St. Mihiel offensive, Brereton earned the Distinguished Service Cross (DSC) for a special low-level observation mission over Thiaucourt, France. Jumped by four Fokker D-VIIs, he maneuvered to allow his observer a clear field of fire, and when his observer was wounded, Brereton landed within friendly lines returning with valuable information.⁴¹ Later, Brereton was suitably modest about his exploit, stating later that he got the DSC while "trying to get home when some Huns got in the way."⁴²

Veteran commander of the 42nd "Rainbow Division and a non-flyer, Maj. Gen. Charles T. Menoher, Director of the Air Service, and his Assistant Executive, Col. Oscar Westover, questioned the loyalty and cooperativeness of Mitchell and the Operations and Training Group, including Brereton, in 1919.



**BRERETON
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DECORATED
OFFICER**

Lewis Brereton ended World War I as a highly decorated officer. In addition to the DSC and a Meritorious Services Citation Certificate—which he traded for a Purple Heart in 1932—he received the Victory Medal with five battle clasps and one defensive sector clasp and the Army of Occupation of Germany Medal. France awarded him the *Croix de Guerre* with two palms and made him an officer of the Legion of Honor; Belgium presented him with the Chevalier, Order of Albert of Belgium; and Montenegro made him a Commander 1st class of the Order of Danilo I. Later, the National Defense Act of 1920 abolished the original Military Aviator rating of 1913 and authorized a new decoration of Military Aviator awarded for distinguished service in France, which included an additional flight pay of 75 percent of an officer's base pay. Brereton was one of only six airmen who earned this decoration.⁴³

**BRERETON
BECAME
CHIEF OF AIR
SERVICE
OPERATIONS
UNDER
MITCHELL**

Immediately following the war, Air Service headquarters experienced considerable upheaval as the service began to disband and officers returned home. Brereton, now a lieutenant colonel, remained with the occupation forces, and on November 19 he became Chief of Staff under Mitchell, who became the Air Service Commander for Third Army. One month later, on December 17, Brereton led the Advance Element of the headquarters to Coblenz, Germany.⁴⁴ The sojourn in Germany was short-lived, however. Brereton saw little future for himself in the occupation force and faced personal problems at home. He first explored the waters, writing Col. Edgar S. Gorrell, Chief of Staff of the Air Service, AEF, on December 8 that he expected to be called as a witness in his wife's effort to break her stepmother's will and there was little real work for him to do in Germany, anyway:

He did not want to offend his patron, however: "I am telling you this personally because General Mitchell asked me to come up here as his Chief of Staff, and as I consider it a compliment to me from him, I rather hesitate to appear desirous of leaving him. However, there is [sic] plenty of personnel available here to take up my very arduous duties!"⁴⁵ The waters must have been warm; on December 27, Brereton formally requested to return to the U.S. Coincidentally, Mitchell also left Germany. He had apparently expected to be named Director of the Air Service in the U.S. after the war. Instead, the position went to a non-flyer, Maj. Gen. Charles Menoher, veteran commander of the 42d "Rainbow" Division. Menoher knew that he needed experienced men to build the postwar air service, however, and asked Pershing for Mitchell. Brereton thus accompanied Mitchell home on the *Aquitania* in February 1919. Mitchell reached Washington on March 3, and took charge of the Operations and Training Group in Air Service headquarters. On March 12, Brereton became chief of Air Service Operations under Mitchell.⁴⁶

Like Brereton, most of "Billy's boys" from France ended up in the Training and Operations Group, which quickly became a hotbed of pro-Mitchell, pro-independent air force activity. At first, this effort had little to do with theories of long-range, strategic bombardment. Mitchell's long-term goal in 1919 was to unite all aviation—military and civil—into one organization under his own command, and his immediate target was coastal defense, then the responsibility of the navy and the army's Coast Artillery Corps. Mitchell compared the army and navy air services, determined that they exercised redundant responsibilities for coastal defense, and concluded that the most efficient approach would be to have the Air Service take over Naval Air, as well as responsibility for civilian aviation. "By a combination of these two services, with other aviation agencies," he wrote, "we eliminate friction and antagonism, promote esprit and efficiency, and avoid duplication of work and needless expenditures."⁴⁷

Mitchell made good use of Brereton's background as a Naval Academy graduate and veteran of the Coast Artillery Corps in this process. When in the summer of 1919, Secretary of the Navy Josephus Daniels enumerated the missions he expected Naval Air to carry out, Brereton prepared a position paper for Mitchell's response. His assessment boiled down to affirming that army airmen were already accomplishing most of the responsibilities Daniels had enumerated, or could do most of them better than the navy. And those the army was not doing were not worth doing, anyway. His paper included the Mitchell mantra on air power: "It is perfectly apparent that with aviation in its present stage of development and with the rapid advances that it is making, that the success of all military operations will be based upon the gaining and maintaining of superiority in the air."⁴⁸

Major Brereton was distinguished during the 1920s as a highly decorated veteran of World War I. (Lewis H. Brereton, III, Dallas, Texas.)

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In October, Mitchell had Brereton prepare a study challenging the views of the General Staff on coastal defense. The General Staff accepted that three forces provided coastal defense: the battle fleet, the navy's coastal defenses, and the army's coastal defenses. The battle fleet was the offensive weapon that sought out the enemy and destroyed him. If the fleet failed, the navy's defensive forces, including submarines and naval air units took over. If these also failed, the army system of coastal fortifications was the last resort. In response, Mitchell and Brereton argued that the air force now had the preeminent role in coastal defense: "The missions of the navy or land forces, as stated above, are based upon sound military principles, but in any discussion of future military operations, the mission of the air forces must also be considered as a major factor." The U.S. needed an air force to find and destroy the enemy's carrier-borne air forces and invasion fleet. By February 1920, Mitchell had devised a three-phase tactical plan for coastal defense. Phase one was reconnaissance by dirigible, phase two was attack to gain control of air; and phase three an attack to destroy the enemy fleet itself. Key to this plan was Mitchell's claim that airplanes could sink ships, a claim that challenged the navy's primacy in a most visible way and would lead to the famous bombing trials at Norfolk, Virginia, in 1921.⁴⁹

In addition to his work in Washington, Brereton traveled extensively, inspecting air stations across the United States. In May, he went to Hazelhurst Field, New York, for experiments with Coast Artillery firing. In June, he investigated operational methods connected with an extensive bombing program at Aberdeen Proving Grounds, Maryland. Shortly afterward, he returned to Hazelhurst Field for the arrival of the British rigid dirigible R-34 and experiments involving aircraft adjusting Coast Artillery fire. In July, he inspected artillery firing centers in North Carolina, Kentucky, and Michigan,⁵⁰ and also renewed acquaintance with Col. Hap Arnold when he inspected Arnold's Western Department. Arnold reported:

I saw Brereton and [William C.] Sherman, joined them at Sacramento and went with them to Los Angeles, March Field and Rockwell Field. They were very much impressed with the lack of morale of the officers and enlisted men at Rockwell Field, this apparently due to the vacillating lack of policy of the present Air Service.⁵¹

The term "vacillating lack of policy" suggested that all was not well with the Air Service in mid-1919, and that was correct. Instead of building a modern air force for the future, Mitchell and his men found it difficult to hold on to what had already been gained. The U.S. demobilized the civilian army created during the war and instituted a postwar policy of retrenchment, which translated into a return to isolationism and a military organization based upon fiscal stringency



rather than combat capability. The Air Service disbanded units, liquidated aircraft and equipment, and closed airfields and facilities. Manpower plummeted from 190,000 men in November 1918 to 27,000 men by June 1919. The officer corps hemorrhaged as volunteer officers were released from active duty and regulars left to seek their fortune in private business. Further, the temporary legislation that had authorized an Air Service in 1918, was due to expire on June 1, 1920, further depressing morale. Luckily, however, Congress acted in time. The National Defense Act of 1920 gave the air arm permanent status as a combatant arm coordinate with the infantry, artillery, and cavalry and authorized it 1,516 officers and 16,000 enlisted men. Following passage of this legislation, most air officers reverted to their permanent ranks. Accordingly, Brereton became a captain again when he transferred to the Air Service permanently on June 30, 1920. On the following day, he was promoted to major, a rank he would hold until March 1935.⁵²

As the Air Service retrenched, its headquarters in Washington shrank, and Brereton left the Training and Operations Group before the end of 1919. Initially, Mitchell attempted to have him assigned to the School of the Line at Fort Leavenworth, Kansas,⁵³ and on July 18, wrote that it was imperative for Brereton, who had only operational experience, to be sent on an extensive tour: "In order that he may carry out his duties intelligently as instructor at the School of the Line, he should be thoroughly familiar with the Air Service as it is in this country at present."⁵⁴ The tour included Fort Leavenworth, where Brereton apparently failed to impress the commandant, who

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GAMES

BRERETON
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FIELD, TEXAS,
IN AUGUST
1922

concluded that the airman lacked appropriate credentials.⁵⁵

Subsequently, Mitchell recommended Brereton to be air attaché to France: "Colonel Brereton has an excellent command of the French language; knows the French people and customs, and has shown by actual contact with them in the war, that he is extremely acceptable to the French Air Service, as he is personally acquainted with many of the higher officials." Mitchell also alluded to Brereton being "able to support the responsibilities of the social position involved in this appointment without embarrassment." This assignment received approval and after temporary duty in the office of the Director of Military Intelligence to learn his new duties, Brereton and his family arrived in Paris on December 25, 1919.⁵⁶

Some effort has been made to paint Brereton as a disciple of Billy Mitchell and apostle of strategic air bombardment.⁵⁷ While Brereton was definitely one of "Billy's boys" in 1918 and 1919, he had no association with strategic bombardment at this point in his career. Mitchell's long-range goal in 1919, as already noted, was to centralize all military and civilian aviation in one organization under his command, and Brereton's background was extremely useful in the short-term effort to seize control of Naval Air's coastal defense mission. But this effort had little to do with strategic bombardment. Mitchell considered Brereton, to be a "splendid officer" who was, "Brave in the face of the enemy. [A] splendid Commander. Probably the best qualified officer in Corps Observation Air Service in the Army."⁵⁸ And while Brereton, as is clear from his *Diaries*, later espoused the doctrine of strategic bombardment, he was always careful not to claim too much from his early association with Mitchell. In 1942, Clare Boothe Luce pressed Brereton about what he had learned from Mitchell during long discussions about the future use of air power. Brereton's terse reply was "plenty!" Asked what he had to say, Brereton after some urging finally replied: "Who me? I said, 'Yes sir' and 'No sir.' Mostly I just listened."⁵⁹ Nothing in the historical record suggests that this was false modesty.

Although it is speculation, Mitchell's rapidly expanding reputation as a zealot and troublemaker may have led to some of Brereton's early career difficulties. By mid-summer 1919, Mitchell was already viewed as obstructionist determined to get his own way at all costs. In late June, Col. Oscar Westover, Assistant Executive to the Director of the Air Service, expressed himself totally dissatisfied with the way the Training and Operations Group responded to General Menoher's directives and its refusal to cooperate with the larger goals of the Air Service. He wrote Menoher that, "Anything which has been done by this office so far at variance with the plans or ideas of [the Training and Operations Group] has been instantly met with some sort of opposition or evasion of the issue."⁶⁰ Most interestingly, Westover wrote that he was not yet at the point of recommending that Mitchell be fired, "although I have in

a separate memorandum, not yet submitted, considered that very thing."⁶¹ At the time Westover wrote this memorandum, Billy Mitchell had only been in Washington a little over four months. Undoubtedly, Mitchell's reputation, which had already been tarnished by lack of cooperation with both ground and air leaders in France, had spread in the small world of the Regular Army. It is quite possible that officials at Fort Leavenworth refused to accept Brereton in 1919, because they wanted to prevent one of Mitchell's men from "infecting" the School of the Line.⁶²

Highlights of Brereton's tour in France included service as an observer at the 1920 Olympic Games in Belgium, and the arrival of Billy Mitchell and a party of officers in December 1921 as part of a grand tour of Europe. Brereton joined Mitchell in Paris for a full plate of ceremonies and activities. Marshall Ferdinand Foch opened the visit with a formal dinner party; Mitchell joined French air officers as a "consulting expert" for a two-week conference on the lessons of the Western Front and the future of war; while Capt. Clayton Bissell and Alfred Verville studied flying fields, factories, and other facilities. Brereton, however, failed to gain the success as an attaché that he had experienced in previous assignments. Col. T. Bentley Mott, the military attaché, rated Brereton above average in physical activity, endurance, and intelligence, but only average in performance, and, devastatingly, below average in "attention to duty," defined as working thoroughly and conscientiously. Mott reported that Brereton required constant supervision; left to himself he became inattentive and indolent. After Brereton left Paris, Mott further complained that Brereton had been careless with money and had left unpaid bills behind. Given his previous record, Brereton's difficulties in Paris were surprising. He may have had personal problems with Mott, or the work may have been unsuited to his taste and ability. More probably, however, Brereton may have had significant difficulty adjusting to the mundane activities of military service in peacetime, a not uncommon problem for men successful in combat. In any case, his assignment to Paris was Brereton's first lapse in what had been an exceptional professional career.⁶³

Brereton reported to Kelly Field, Texas, in August 1922. There he served variously as commander of the 10th School Group, assistant commander of the Advanced Flying School, Director of Attack Training, and President of the Board on Attack Aviation.⁶⁴ Then, on February 2, 1923, Billy Mitchell arrived for an inspection, which revealed serious problems with the 3d Attack Group. He reported to Maj. Gen. Mason Patrick, new Chief of the Air Service, that the commander and most of the men were inexperienced and that operations, training, equipment, and facilities were unsatisfactory. His solution was to place Brereton in command. Mitchell then spent several days helping Brereton and a new staff clear up problems. On February 9, they staged an exercise during which



The Flight line at Kelly Field outside San Antonio, Texas. Kelly was the home of the 3rd Attack Group in 1923 and 1924 when Brereton was its commander.

the group, flying DeHaviland DH-4B's and three Engineering Division GA-1 twin-engine attack aircraft, simulated an attack on a truck column near Laredo on the Mexican border. This exercise was successful. "I believe even with the way the group is now, no Mexican column can move in the daytime within 100 miles of where this group is stationed," Mitchell told Patrick in his characteristic style.⁶⁵

In 1923, the Air Service had only three major combat organizations, the 1st Pursuit Group at Selfridge Field, Michigan; the 2d Bombardment Group at Langley Field, Virginia; and the 3d Attack Group at Kelly. "We had a beautiful little air force until the war came along and spoiled it," veteran Emmett "Rosie" O'Donnell recalled. "That was the air force."⁶⁶ Mitchell's intervention thus gave Brereton one of the three most important operational commands available, and Brereton made the most of his new responsibilities. An inspection on May 5, 1923, by Maj. Gen. Eli A. Helmick, Inspector General of the Army, commended him along with Maj. Horace A. Hickam, commander of the School Group, and Maj. Harvey B. S. Burwell, head of the Operations Office, for achieving a "very high degree of training and discipline" in their units.⁶⁷ Through 1923, Brereton's efficiency reports from Lt. Col. John H. Howard, Commander of Kelly Field, were also highly com-

While the standard aircraft of the 3rd Attack Group was the single-engine, DeHaviland DH-4B, the Group also experimented with the armored GA-1. Designed by the Engineering Division at Wright Field, Ohio, this twin-engine monstrosity came equipped with one 37 mm gun and eight .30 caliber machine guns.



plimentary. Howard described him as "a hard working, conscientious officer [who] has considerable confidence in his ability and is possessed of more than the average amount of brains."⁶⁸ Howard's evaluation in June 1924, however, reduced Brereton's rating to average in most categories. Howard gave no reason for this change, although he noted that Brereton had been handicapped by a shortage of personnel.⁶⁹

Brereton also seems to have played a minor role in the development of a radical new tactic, dive bombing. Under Brereton the 3d Attack Group, flying DH-4Bs equipped with the new A-3 bomb rack, perfected a low-altitude, high-angle attack known as the "diving attack," a tactic picked up from the Royal Air Force during World War I. The essential difference between the diving attack and dive bombing was the angle of descent, which approached the perpendicular for a dive bomber. While assigned to Kelly Field in 1923, Maj. Ross E. Rowell, a U.S. Marine Corps pilot, was deeply impressed by the 3d Attack Group's accuracy. After returning to the Naval Air Station at San Diego, California, Rowell trained his squadron, VO-1M, to use the diving attack. Navy aviators soon picked up the technique. Subsequently, Lt. Cmdr. Frank D. Wagner, flying the new Curtiss F6C Hawk—which was built to handle extreme stresses—conducted a series of increasingly steep dives that evolved into dive bombing. The U.S. Navy subsequently perfected dive bombing, using it with devastating success during World War II, especially at the Battle of Midway.⁷⁰

On September 15, 1924, Brereton reported to Langley Field, Virginia, as an instructor in the Air Service Tactical School. Organized by Maj. Thomas DeW. Milling in late 1920, the school had three departments: the Department of Military Art (Tactical), the Department of Aeronautical Engineering, and the Department of Administration. The most important of these was the Department of Military Art, which by 1923 devoted 118 hours of instruction to observation, 56 to bombardment, 84 to pursuit, 60 to attack, and 54 to combined air tactics. The school had not yet turned into the bastion of daylight strategic bombardment that it would become in the 1930s, especially under its conservative commandant in 1924-1925, Maj. Oscar Westover—who would have remembered Brereton as one of "Billy's boys" from Air Service headquarters in 1919. School records from the period are rare, but it is most likely that Brereton taught courses in observation and, possibly, ground attack techniques. Brereton failed to shine as an instructor, however. Both Westover and Milling, then deputy commandant, rated his performance average, and concurred that he was better suited to commanding troops. Brereton's performance also may have reflected, once again, the postwar problems faced by someone successful in war who continued to have trouble adjusting to peacetime activities. Personal problems may also have contributed. Brereton's mother was seriously ill by early 1925 (both parents would die that sum-

BRERETON'S PARTICIPATION IN THE FAMOUS COURTS-MARTIAL REMAINS CLOUDY

MAJOR BRERETON'S RELEASE SHOULD IN NO WAY BE TAKEN AS AN INDICATION THAT HIS WORK AS A MEMBER OF THE BOARD WAS NOT SATISFACTORY

mer), he appears to have been suffering from financial difficulties, and the marital problems that would affect his career two years later were undoubtedly evident.⁷¹

In June 1925, Brereton took command of the 2d Bombardment Group at Langley Field, an assignment that placed him in the mainstream of the Air Service movement toward strategic bombardment as the primary mission of an independent air force. The most visible advocate of this mission was Billy Mitchell and his stridency had already cost him his job as Assistant Chief of the Air Service in March 1925. Mitchell was returned to his permanent rank of colonel and exiled to San Antonio, Texas. In one of the seminal events in the history of air power, following the loss of the naval dirigible, *Shenandoah*—which cost the life of Mitchell's friend, Capt. Edward Lansdowne, and thirteen other men—Billy Mitchell accused the War and Navy Departments of "incompetency, criminal negligence, and almost treasonable administration of the national defense." Mitchell's highly publicized courts-martial began in November 1925.⁷²

Brereton's participation in the famous courts-martial remains cloudy. He later claimed to have served on Mitchell's defense counsel staff, thus, some writers have assigned him a significant role as one of Mitchell's defenders; others credit him with a lesser role as an associate counsel; and one credits him with being both counsel and witness. The "Orders and Assignments" section of Brereton's 201 File contains a faded, indistinct entry, which indicates that Brereton received orders sending him to Washington, D.C., to appear as a witness. The trial transcript, however, shows that he did not testify. One of the five witnesses summoned on November 11—the day that Brereton seems to have been in Washington—was Capt. Bernard V. Baucom from the Tactical Section of the office of the Chief of the Air Service, who testified on the difficulties he had experienced coordinating with ground troops and artillery as an observer with the 1st Aero Squadron during World War I, and on the ineffectiveness of antiaircraft fire against aircraft.⁷³ Possibly, Brereton may have assisted Mitchell's defense in framing questions about observation operations during World War I. However, the airman Brig. Gen. Malin Craig, future Chief of Staff of the U.S. Army, called in 1918, "a good pilot [and] an excellent observer [and] the most competent Air Service chief of the 1st Corps during its combat operations"⁷⁴ would have been an ideal witness on the subjects Baucom addressed. Based on available evidence, Brereton played a limited role in the courts-martial, but the reason the defense failed to call him to testify is uncertain. The court convicted Mitchell on December 17, and he subsequently resigned from the Air Service. Brereton's view of the end of his early sponsor's career was one common among airmen:

Mitchell was guilty, all right, of the charge he was ostensibly court-martialed on, insubordination—

*an attitude calculated to cause the public to lose faith in the judgement of high Army officials. He believed that military men who didn't realize the importance of the air had no right to breathe it in America. But of his air-mindedness, time has wholly vindicated him.*⁷⁵

In addition to commanding the 2d Bombardment Group, Brereton also served as a member of the Bombardment Board that evaluated new bombers and equipment. In March 1926, for example, he and 1st Lt. Muir S. Fairchild participated in service tests for the Huff-Deland LB-1, a single-engine light bomber, and the Curtiss NBS-4, a twin-engine night bomber. And in December, Brereton, and several officers including future generals Barney M. Giles, and Harold L. George conducted service tests on the Huff-Deland XLB-5 twin-engine light bomber.⁷⁶

These efforts drew Brereton away from Langley and, in fact, he was absent from the 2d Bombardment Group so much that his unit suffered. Maj. Walter H. Frank, Commander of Langley Field, reported that with both Brereton and his deputy, Capt. Willis S. Hale, on the Bombardment Board, the Group was in the hands of an inexperienced captain. Frank recommended that either Brereton return to his duties or an experienced officer be assigned in his place. Brereton protested that he had been on the board for a year, had been a valuable contributor, and was the most qualified officer available. "Relief as a member of this board in its present unfinished status cannot but appear to me as an express of dissatisfaction with my services," he wrote, and he recommended that Hale command the 2d while he remained with the Bombardment Board.⁷⁷ On January 11, 1927, Major General Patrick concluded that it was in the best interests of the service that Captain Hale continue to serve with the Bombardment Board and that Major Brereton should return to his command at Langley. "Major Brereton's release," Patrick assured, "should in no way be taken as an indication that his work as a member of the board was not satisfactory."⁷⁸

On February 23, 1927, Brereton complained to General Patrick again. Lt. Col. Clarence C. Culver, the new Langley commander, had turned down a request for ten days' leave on instructions from "higher authority" because of his excessive absences during the previous months. Brereton presented a memo showing that Air Corps Headquarters had ordered most of his trips, protested that the rejection of leave placed him "no little business difficulties," and requested reconsideration because the decision was disciplinary in nature. Patrick responded that nothing indicated that the denial of leave was disciplinary. Leave was a privilege granted when an officer could be spared, and that it appeared that Brereton needed to be with his command in preparation for coming maneuvers in Texas.⁷⁹ Brereton's efficiency reports during the period also reflected serious problems. Both Westover and Culver rated his performance aver-



On April 8, 1927, Brereton's Huff-Daland LB-1 lost its engine during a takeoff at Langley Field and made a forced landing on the edge of the field. He and his passenger were uninjured. Minor accidents were extremely common in the 1920s and 1930s, and Brereton had his share. (Air Force Historical Research Agency, Maxwell AFB, Alabama.)

BRERETON RECEIVED ORDERS TO ATTEND COMMAND AND GENERAL STAFF SCHOOL AT FORT LEAVENWORTH, KANSAS

age. Westover described him as "An officer of latent ability who does not apply himself with wholehearted interest." "[He] is a good commander when present and interested," Westover added, "but his interest varies." And he summarized his views with the words, "In my opinion this officer does not apply himself to the extent expected of an officer of his rank and experience."⁸⁰

On February 22, 1927, Brereton had requested two weeks of sick leave because personal difficulties had affected his health. "I have been under a nervous strain due to my conditions of living for a protracted time.... The condition is adversely affecting my flying."⁸¹ Maj. Benjamin B. Warriner of the Medical Corps endorsed a sick leave for two months because Brereton "is suffering from an incipient anxiety neurosis of moderate degree characterized by a beginning fear of flying.... Cause—domestic difficulties."⁸² Warriner believed this condition had probably existed for several years. Brereton wanted to participate in upcoming exercises in Georgia, Kansas, and Texas, thus he requested a few days leave to see a specialist in New York, a return to duty with restrictions in May, and then the sick leave necessary for further treatment. While his request wended its way through Air Corps channels, an accident added to Brereton's problems. On April 7, his Huff-Deland LB-1 lost its engine shortly after takeoff. Brereton succeeded in bringing the aircraft down on the edge of the water near Langley Field's machine gun range, damaging the prop, landing gear, and lower wings. Brereton and his mechanic emerged unscathed, but the narrow escape increased the tension affecting his life. Subsequently, the Air Corps granted Brereton's request, and he consulted with Dr. A. A. Brill, a well-known New York psychoanalyst, who concluded that the airman was suffering from anxiety.⁸³

Shortly afterward, Brereton received orders to attend Command and General Staff School at Fort Leavenworth, Kansas, beginning at the end of August. On June 6, he renewed his application for two months leave prior to reporting to the school, so that he could be treated by Dr. Brill at his own

expense. Brereton's personal life had been in turmoil for some time. He was never much of a family man, he had financial problems, and his marriage had been characterized by frequent arguments with his wife, with which he dealt by leaving temporarily. There had been infidelity on both sides and Brereton had been drinking heavily at times. The resulting nervous anxiety, insomnia, and nightmares had been aggravated by the constant strain of his work during the Air Corps maneuvers in Texas, a near-collision with another aircraft at Little Rock, Arkansas, and the crash of an XLB-5 during which the airplane burned, a member of the crew died, and Brereton had to bail out. In mid-June, Lt. Col. Levy M. Hathaway, Chief of the Medical Section of the Air Corps, and Capt. Ira F. Peak, medical officer at Langley Field, examined Brereton, who reported that his domestic difficulties had been settled, because his wife left him the previous week. Hathaway found no signs of alcoholism or that Brereton's drinking had affected his duties.⁸⁴ He concluded that psychoanalysis probably would not work but "since this officer desires to secure the treatment by Dr. Brill, at his own expense, and since Dr. Brill is a recognized authority and leading expert of psychoanalysis in this country, it would seem proper to approve the sick leave."⁸⁵ Peak's report also included a laudatory description of Brereton as an officer and commander in the late 1920s:

He has a bright, clear, logical and analytical mind. He easily and quickly grasps the main scope of problems and situations with their main details. He is very much liked by the personnel of his command as he is always for his own personnel, first, last and all the time. He is fair and just in his judgements and does not hold a grudge. He is a good sportsman in losing. Keeps himself physically fit by athletics. He is a good administrator in that he leaves details to subordinates and does not interfere with them while he directs the important policies; though he personally knows the details as well.⁸⁶

Before taking leave, Brereton made what must be considered, at best, a serious error in judgment. The catalyst was, of all people, Charles Lindbergh. Following his solo flight across the Atlantic, Lindbergh had returned to the U.S., where he was honored with a series of ceremonies, including one in Washington, D.C. Air Corps leaders determined to rendezvous with Lindbergh's airplane during its flight from New York City on Saturday, June 11, and escort it to the nation's capitol. The initial radiogram to Langley on June 3 apparently caused the confusion, since it encouraged officers "who had especially distinguished services in war or peace aviation to fly to Washington for [the] Lindbergh reception." Maj. Brereton and 2d Lt. Reginald H. Gillespie, were selected. A subsequent telegram from the Chief of the Air Corps on June 7, however, made it clear that these officers "would form part of the person-

Maj. Gen. Preston Brown, Commander, 1st Corps Area, did not want Brereton in his headquarters in 1927. Brereton's performance as Air Officer in the Panama Canal Zone when Brown was commander in the early 1930s, however, changed his mind about the airman. (*National Archives.*)

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nel of [an] escort of bombardment planes."⁸⁷ The operational orders issued to Brereton instructed him to lead a formation of ten bombers from the 20th and 96th Bombardment Squadrons to Bolling Field on Friday, June 10, where he would receive additional orders. The flight arrived late on Friday and remained overnight. Instead of reporting to the commander at Bolling, however, Brereton disappeared. On Saturday, his second in command, Captain Hale, led the formation that escorted Lindbergh into Washington and then flew back to Langley. Brereton returned to Norfolk on June 12 by ship.⁸⁸

In explanation, Brereton emphasized that the radiogram received at Langley referred to a reception and that he understood that he was to proceed to Washington to attend a function honoring Lindbergh. Thinking he could not be at the reception and lead the escort, Brereton ordered Captain Hale to act as flight commander. Then, he had attended the President's reception for Lindbergh held at Potomac Park "and was close enough to hear his address at that time." Brereton subsequently attempted to return to Bolling Field but the traffic was so heavy that he decided that it was useless, especially since the flight was supposed to fly home immediately after escorting Lindbergh. Later in the afternoon, he found that there were no further social events for him to attend, so that evening he returned to Langley.⁸⁹

Brereton's superiors found this explanation unsatisfactory. The Secretary of War found Brereton guilty of absence without leave from 0900 on the June 11 to 0900 on June 12, stopped all pay and allowances for that period, and had a formal letter of reprimand placed in Brereton's file. The punishment actually was quite lenient. Brereton might have been charged with abandoning his command and failing to comply with orders, which would have ended his career. However, while this punishment seriously blemished Brereton's record, it did not necessarily do permanent harm. Other officers rose to high rank despite official reprimands, including the first Chief of Staff of the U.S. Air Force, Carl Spaatz.⁹⁰ Brereton would face repercussions, however.

In early August, Brereton returned to Langley from his two month's sick leave. The treatment by Dr. Brill, the separation from his wife, or some unrecorded change apparently had an effect, and the Flight Surgeon restored him to flying status. Brereton then departed for Command and General Staff School at Fort Leavenworth on August 15. For the next year, Brereton took the ground-oriented course of instruction standard for all army officers of the period. He graduated on June 27, 1928, but his performance was less than stellar, an experience that seems to have been rather common to Air Corps officers who had left the world of the infantry and cavalry behind. The Command and General Staff School refused to recommend him for further military education.⁹¹

Brereton's next assignment became a bone of contention while he was at Fort Leavenworth. Air



Corps headquarters initially assigned him to a highly visible position at Headquarters, First Corps near New York City. Maj. Gen. Preston Brown, First Corps Commander, initially approved the assignment, but then had second thoughts. Brown had been chief of staff of the 2d Infantry Division from Chateau Thierry through St. Mihiel and commander of the 3d Infantry Division during the Meuse-Argonne Campaign. He was known also one of the toughest men in the army, although he appears to have gotten on well with most Air Corps officers.⁹² On April 13, he wrote Maj. Gen. James E. Fechet, Commander of the Air Corps, that after thinking the matter over and making inquiries he had withdrawn his approval. In explanation, Brown indicated that he must have a man "socially qualified to meet the very nicest people here who take an interest in aviation, all of whom are members of the best clubs in town, and with whom it is hard to reconcile a man who is not up to standard."⁹³ Brown's words were innocuous enough and could be interpreted to indicate that Brereton's upper middle class origins failed to provide the proper standing for New York society, but, as will be apparent below, he did in fact know about Brereton's problems in 1927 and was determined not to have him at First Corps Headquarters. Instead of New York, Brereton received orders to Fort Sill, Oklahoma, as commander of the 88th Observation Squadron and Air Service Instructor at the Field Artillery School.

(Right) Maj. Lewis Hyde Brereton in the early 1930s.

HIS FITNESS REPORTS FROM THE BEGINNING OF 1930 THROUGH THE SUMMER OF 1931 RATED HIM EXCELLENT IN MOST CATEGORIES AND SUPERIOR IN INTELLIGENCE

Major Brereton reported to Fort Sill on August 15, 1928. His new assignment as a squadron commander and instructor was a definite comedown for an officer who had commanded two of the Air Corps' three combat groups, but Brereton appears to have made the best of the situation. His extensive practical experience as commander of an observation squadron during World War I proved a definite advantage, and he appears to have shown some talent for developing a syllabus and program of instruction. Since he had been less successful earlier at the Air Corps Tactical School, it seems logical to conclude that the resolution of his personal situation contributed to improved performance. By early 1930, he had developed a well-balanced training schedule that met the requirements of the Field Artillery School. Two events that took place during this period are worth noting. First, on February 20, 1931, Brereton married Ovey J. "Icy" Larkin. And that same year, the 88th Observation Squadron participated in the Air Corps exercises held at Wright Field, near Dayton, Ohio, and Brereton's squadron subsequently received a commendation from the Chief of Staff of the U.S. Army, Gen. Douglas MacArthur.⁹⁴ His fitness reports from the beginning of 1930 through the summer of 1931 rated him excellent in most categories and superior in intelligence, and Lt. Col. Lesley J. McNair, the Assistant Commandant of the School, summarized that Brereton had "shown himself broad minded, progressive, cooperative, and efficient." The Commandant, Brig. Gen. William M. Cruickshank, added that Brereton was an exceptionally valuable officer to have at the school.⁹⁵

Brereton's assignment to Fort Sill ended on July 1, 1931, and he took up new responsibilities in one of the most sensitive and critical locations outside the continental United States, the Panama Canal Zone. Beginning on August 4, he served as commander of France Field, the 6th Composite Group, and the Panama Air Depot, subsequently becoming Air Officer of the Panama Canal Department. Given future events in the Philippine Islands, Brereton's assignment to Panama may have been one of the more important of those he

France Field was one of the principal Air Corps facilities in the Panama Canal Zone during the 1930s. (National Archives.)



held during the interwar years, since the primary mission was air defense of the Canal Zone against hostile attack, the kind of problem that he would face ten years later. In Panama, Brereton gained practical experience with the use of interceptor aircraft and ground defense systems as well as the problems posed by the need for early warning systems and effective communications.

Brereton initially served under Maj. Gen. Preston Brown, the officer who had prevented his assignment to First Corps Headquarters in 1928. Brown, according to Air Corps Lt. John W. Sessums, Jr., who was detailed as his pilot, had already fired two air officers in Panama and wanted to fire Brereton. In Sessums' opinion, Brereton was an energetic officer and good leader. Brown, however, had a preconceived notion—almost certainly based upon the events of 1927—that Brereton was untrustworthy because of his marital and social life. He was out to end the major's career.⁹⁶

Sessums' comments were the prelude to a curious anecdote. According to Sessums, on June 22, 1934, Brereton flew a Boeing P-12B from France Field to Balboa Field to join others who tended to socialize at the Century Club in the afternoon. The weather turned bad, and the operations people at Balboa warned Brereton not to try and fly back to France Field. Brereton ignored them. "The weather was horrible; it had torrential rain and some fog, mixed in it." His engine quit, and Brereton put the aircraft into the water in an inlet on the canal. He was unhurt, but the airplane sank. General Brown figured that Brereton had been drinking, was using the P-12B's 25-gallon reserve tank, and was too drunk to switch to the main tank. Brown ordered Sessums to notify him immediately when the aircraft was recovered, so that he could check the position of the fuel switch.



On June 22, 1932, the engine in Brereton's Boeing P-12B quit during a late afternoon flight from Balboa Field to France Field in the Panama Canal Zone. Brereton put the aircraft into the Mandingo River from which it was later recovered. This is the incident Maj. Gen. John W. Sessums, Jr., recounted during an interview many years later. (*Air Force Historical Research Agency, Maxwell AFB, Alabama.*)

Brereton, no dummy according to Sessums, knew what was going on and was standing with Sessums and Brown when the aircraft was raised. As soon as the aircraft came up, Brereton knocked Sessums aside, stepped into the cockpit, and then stepped out. When Sessums looked in, the fuel switch was set on the main tank. Brown was livid.⁹⁷

Sessums' account has the air of an old story well-polished by repetition and fails to accord with the available facts. Brereton's official report states that he had taken off from LaVenta for France Field at 1630. As he passed over Albrook Field, he noted that twenty gallons of fuel remained in the tank and switched from the main to the reserve tank. About five minutes later the engine began to miss. Brereton resorted to the hand wobble pump, but the engine stopped and he had to put the aircraft down in the Mandingo River. The engineering officer who examined the recovered aircraft concluded that a malfunctioning fuel system caused the engine to stop, but was unable to identify any fault or stoppage. His report also noted that the fuel selector, in contrast to the Sessums story, was set on reserve—Brereton thus did not change the setting to the main tank—and the reserve tank contained between twelve and fifteen gallons of fuel, so lack of fuel was not the problem.⁹⁸

Further, Brown's efficiency reports on Brereton present an interesting story. The first, for July 1, 1931 through June 30, 1932, essentially validates

On June 2, 1934, the right wheel and brake on the Thomas Morse O-19C flown by Brereton seized during a landing at Albrook Field, Panama Canal Zone. The aircraft ground looped, wiping out the landing gear. The officer on the left appears to be Brereton. (*Air Force Historical Research Agency, Maxwell AFB, Alabama.*)



Sessums's memory. Brown rated Brereton's performance "satisfactory" and called him "well-educated, intelligent, and forceful" but qualified those comments by stating that he was only fit for his present assignment under close supervision.⁹⁹ The subsequent efficiency report through June 30, 1933, however, rated his performance "excellent," and Brown went on to state that Brereton "has shown great improvement and is entitled to a modification of previous estimates."¹⁰⁰ The subsequent efficiency report, by Brown's successor, Maj. Gen. H. B. Fiske, called Brereton: "A fine pilot and tactician, cooperating well with other arms, agreeable personality and habit of easy but effective command."¹⁰¹ Finally, a June 1935 report of inspection of France Field for "outstanding administrative methods related to the operation and maintenance of aircraft, in the administration of the Air Depot, and in the supervision of Quartermaster activities."¹⁰² In short, Brereton's performance through mid-1933 had reversed Brown's former opinion of the airman, and his subsequent activities sustained that reputation.

Brereton also impressed some of the younger officers with his attention to detail. Jacob Smart was a young lieutenant flying P-12Es for the 78th Pursuit Squadron at Albrook Field. During one set of maneuvers, the 6th Composite Group had established a tent city for the deployed personnel. Major Brereton had established various rules including one that forbade the use of motor vehicles in the tent area. Smart was assigned as the provost marshal and had to enforce the rules. One day a motorcycle and sidecar appeared in the tent area, and Smart had to halt it, inform the driver of the rules, and order him out of the camp, at the same time saluting Major Brereton who was in the sidecar testing that his orders were being followed. Brereton also added further to his reputation as a man of action. On May 23, 1934, a Navy P2D airplane crashed in the water off Panama City. Brereton and Lt. Cornelius W. Cousland flew to the rescue in a U.S. Army Douglas Y1C-21 amphibian, saving Ensign Otto Wieselmayr and Aviation Chief Machinist Mate Marcus S. Rice, while receiving painful burns in the process. And he demonstrated a somewhat unexpected flair for diplomatic activities and goodwill gestures. In May 1935, Lt. Col. Brereton—he had been promoted in March—led a flight of two bombers and seven observation aircraft from France Field to San Salvador, capitol of El Salvador, arriving on Tuesday afternoon, May 14. The twenty American officers attended a reception with the Minister of War and officers of the Salvadoran Air Force that evening. Then on Wednesday, Brereton lunched with President Martinez, and on Thursday, he gave Salvadoran officials flights over the city. Later, Brereton met with the president and his cabinet at the presidential palace. Officers and men, the American ambassador reported to the State Department, made a great impression, and Brereton deserved much credit.¹⁰³

Brereton's service in the Panama Canal Zone

(Near right) His tenure at Fort Leavenworth enabled Brereton to resume his association with many Air Corps officers who would play prominent roles in World War II, including another highly-decorated veteran of World War I combat, Lt. Col. Carl H. Spaatz.

(Far right) Brereton and Maj. Gen. Henry H. "Hap" Arnold knew each other well, though they apparently did not have a close relationship. By 1941, Arnold and Brereton were two of only a handful of officers still on active duty who had earned the Military Aviator badge established in 1913. It is the decoration on the right lower edge of the photo.



**BRERETON
RECEIVED
UNIFORMLY
EXCELLENT
AND
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did much to restore the reputation that he had lost earlier; however, his next assignment was hardly a desirable one for an airman. In August 1935, he took up a four-year appointment as Air Corps instructor at the U.S. Army's Command and General Staff School, at Fort Leavenworth, Kansas, the institution at which he had performed poorly seven years earlier. The assignment to Fort Leavenworth took Brereton out of the mainstream of air power development, including the theoretical work at the Air Corps Tactical School, the establishment of General Headquarters (GHQ) Air Force under Maj. Gen. Frank Andrews, and the advent of the Boeing B-17 Flying Fortress; however, it also insulated him to some extent from the controversies that rent the Air Corps during the 1930s and side-tracked the careers of some officers.

The curriculum at Fort Leavenworth concentrated on ground-based combat arms taught largely through map reading and staff exercises. It offered little to stimulate airmen. Only nine of 209 conference periods in school year 1936-1937 dealt with aviation and the lessons had not changed since 1926. The concept of strategic bombing was avoided so as not to cause undue excitement. The Air Corps representative on the staff had little control over what was taught, and his influence was limited further by the lack of modern aircraft for demonstrations. Perhaps the biggest advantage to the assignment was to the opportunity to meet or renew association with a wide variety of U.S. Army and Army Air Corps officers. Among the airmen that attended the School during Brereton's tenure were Ira Eaker, George Stratemeyer, Carl Spaatz, and Eugene Eubank. None of these men was impressed with the school. Major Eaker, for one, referred to it as the "Little House" in contrast to the "Big House," the nickname of the Federal prison located next door, and was especially disgusted with the school's emphasis on horses.¹⁰⁴ Spaatz, who attended in 1935-1936, was "a hard drinker 'with a face like a rusty nail' who munched

cigars and whose all-night poker games were legendary."¹⁰⁵ He took little interest in the course and was there only to get out of Washington. In results somewhat similar to those achieved by Brereton as a student in 1927-1928, Spaatz's last efficiency report while in residence concluded that he was unsuited either for high command or for duty with the General Staff!¹⁰⁶

Brereton received uniformly excellent and superior efficiency reports while at Fort Leavenworth, and most suggested that he was suited for higher command and service in staff positions.¹⁰⁷ Brig. Gen. F. W. Honeycutt, Assistant Commander, for example described him as "Capable, energetic, pleasing personality, humorous, thorough and resolute."¹⁰⁸ One student, James V. Collier, recalled that the students found Brereton an effective instructor and that he "did very well" teaching the air course. Also, Brereton put on the eagles of a colonel on August 26, 1936.¹⁰⁹

On a negative note, however, by 1937 his eyesight had deteriorated although lenses could correct it to 20-20. From then on, Brereton had to wear glasses and obtain a waiver to allow him to fly military aircraft. In 1937, Brereton's vision was 20-70 in one eye and 20-30 in the other. In a recent interview, Dr. Thomas J. Tredici, U.S. Air Force School of Aerospace Medicine, stated that the loss of stereo optic vision, an essential element of depth perception, would be pronounced for someone with vision twice as bad in one eye as the other. Brereton's sight had probably deteriorated slowly for some time. He experienced at least five accidents between 1932 and 1934. Mechanical problems and, possibly, an element of carelessness



U.S. Army Air Forces
Douglas A-24 Dauntless
dive bombers near Mount
Carmel during the
Louisiana Maneuvers,
September 17, 1941.
(National Archives.)

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explain three of them, and one must keep in mind that aircraft of the period were dangerous and unreliable. Accidents occurred frequently. Two landing accidents, in 1932 and 1936, however, may have been caused by a loss of stereo optic vision. Brereton may have recognized that he had a problem. Earl W. Barnes, who flew with him several times, later expressed disgust at Brereton's habit of having his copilot land the airplane. Real pilots, in Barnes's opinion, landed their own planes.¹¹⁰ Dr. Tredici concluded that Brereton "was probably wise to turn over the controls to the copilot."¹¹¹

Despite his excellent performance, Brereton was unhappy with his assignment to Fort Leavenworth. In February 1937, he requested a detail to the *Ecole Supérieur de l'Guerre* in Paris. He described himself as well qualified for the assignment because he spoke French and his current assignment as an instructor has given him "an especially sound foundation for such a detail." Brigadier General Hap Arnold, now Assistant Chief of the Air Corps, promised to recommend Brereton to Major General Westover, now Chief of the Air Corps.¹¹² Despite Arnold's support, Brereton failed to get the posting.

Brereton was also concerned about promotion to general, a distinct and tantalizing possibility once he had gained his eagles and given the expansion of the U.S. Army on the horizon at the end of the 1930s. Under ordinary conditions, however, this required attendance at the U.S. Army War College, and time was running out. Brereton was forty-seven in 1937. If he failed to attend with the class of 1939-1940, he would be too old under army regulations to enter the next class. Brereton applied for the class of 1938-1939, which required him to leave his four-year appointment one year early. Brig. Gen. Charles M. Brundel, the Commandant, endorsed his request favorably,¹¹³ but another instructor was selected instead, despite having been at the Staff School for only two years. An indignant, Brereton protested the decision to Hap Arnold: "[I]t seems to me that I have been slighted in a manner that my service does not

deserve." In a cordial, but somewhat formal letter, Brereton was emphatic: "I have been, and am, fulfilling a duty here which is not of my own choosing, and doing it, if I may say so, damn well." He acknowledged that his own record in the late 1920s was probably the reason that he was not selected, recognizing "for a period prior to my coming here as a student in 1927-28, that my record, due entirely to personal and unofficial stresses of living, did not do me justice." In contrast, he emphasized his broad and varied experience during World War I. He pointed out that 1939 would be his last opportunity to attend the War College and asked Arnold's assistance in entering the 1938 class: "I naturally hesitate to address General Westover directly on this question. However, if becoming, I do beg you, as a personal favor, to present my request in a suitable manner—this letter if deemed advisable."¹¹⁴

Arnold's response held out some hope, but was clearly cautionary. General Westover's policy, according to Arnold, was to appoint the "officers whose entire military record has been such to warrant their selection." Slight differences in those records thus determined who would be selected and who would not. Arnold concurred with Brereton that his poor performance as a student in the Command and General Staff School in 1927-1928 hurt, but also consoled Brereton by assuring him that his "record and service will merit the utmost consideration in future selections, especially in 1939, when your normal tour of duty at the Command and General Staff School will be completed."¹¹⁵

In June 1938, Westover did ask General Brundel if Brereton could be spared from his assignment; however, despite support from Brundel, when the Department of War announced the officers selected for the class of 1939-1940 in November 1938, Brereton was omitted once again.¹¹⁶ Subsequently, General Brundel wrote the Army Adjutant General urging Brereton's selection for the 1939 class: "Colonel Brereton is in fact an officer of great promise with a rising curve of efficiency."¹¹⁷ Senator Morris Sheppard on the Committee of Military Affairs wrote Gen. Malin Craig, Chief of Staff, "without the knowledge or consent of Colonel Brereton" asking that Craig look into the situation.¹¹⁸ General Craig replied that the selection for the school was done fairly and he would take no further action. He noted, however, that it was no longer necessary for an officer to be a graduate to be selected for important assignments or promoted to higher rank.¹¹⁹

Brereton's tenure at the Command and General Staff School came to an end during the summer of 1939, and in June he took command of Barksdale Field near Shreveport, Louisiana. Brereton's command reported to the Third Wing of GHQ Air Force, and as such was intimately involved in the intense preparations necessary as the Army Air Corps readied itself for war. The assignment to Barksdale was perfect for Brereton and in one respect brought his career full circle for his main



Lt. Gen. Walter Kreuger, Commanding General, Third Army, Gen. Lesley J. McNair, Chief of Staff of GHQ, and Maneuver Director, and Maj. Gen. Herbert G. Dargue, 3rd Air Task Force Commander during the Louisiana Maneuvers, September 1941. Brereton's Third Air Force was responsible for setting up and operating maintenance centers to support the air task forces for both Second and Third Army. (National Archives.)

(Below) Maj. Gen. Millard F. Harmon, Commander, 2nd Air Task Force, Maj. Gen. Clarence Ridley, Commander, 6th Division, Maj. Gen. C. L. Scott, Commander, 1st Armored Corps, Lt. Gen. Ben Lear, Commander, Second Army, and Maj. Gen. Robert C. Richardson, Commander, 7th Army Corps, during the Louisiana Maneuvers, September 1941. (National Archives.)

operational unit was the old 3d Attack Group, now designated the 3d Bombardment Group (Light), and equipped with Northrop A-17 and Curtiss A-18 single-engine attack aircraft, and Douglas B-18 twin-engine horizontal bombers. The major event of the next year was Brereton's participation in Third Army maneuvers, held in late May 1940. On short notice, his command prepared an airfield for the 1st Pursuit Group at McComb, Mississippi, that accommodated 800 officers and enlisted personnel and provided the air logistical support for the Third Wing and other units assigned to Third Army. Brereton was commended for his effort and in October 1940 was promoted to brigadier general.¹²⁰

The new general then took command of the 17th Bombardment Wing (Light) at Savannah, Georgia, on October 1, 1940, and continued his exceptional performance. From February through June 1941, the 17th Bombardment Wing participated in combined air support, directed by the IV Army Corps with ground elements from the 2d Armored Division and 4th and 31st Infantry Divisions. During these exercises, Brereton's air-

men developed procedures for command posts and communications systems for ground support units. The exercises also provided information on the identification problems between ground and air and judging safe bombing distances from targets.¹²¹ Brereton and Maj. Gen. Jay L. Benedict, Commander of IV Corps, submitted reports and compiled a draft training circular that, according to scholar Garner Johnson, formed the basis for a rapidly developing close support doctrine that would see the U.S. through World War II. Benedict and Brereton confirmed that the doctrine presented in previous manuals held true. Both reinforced the need for air supremacy, use of outside support outside artillery range except at decisive points, the importance of striking rear area targets, and the need to conserve air resources.¹²²

Beyond his contribution to air-ground cooperation, Brereton continued to excel, not only in aviation work, but in his ability to work with ground commanders. In mid-1941, Brereton's immediate superior, Maj. Gen. Barton K. Yount, Commander of Third Air Force, rated him number nine out of eighty brigadier generals and called him a "superior general officer." Brereton, Yount, concluded, "is a good administrator...a fine tactical commander...is well prepared for high command."¹²³ Maj. Gen. Delos C. Emmons, Commander of GHQ Air Force, concurred; he rated Brereton's performance "superior," and ranked him number fifteen out of seventy-five brigadier generals.¹²⁴

The June 20, 1941 reorganization of the War Department created the U.S. Army Air Forces, giving that organization the degree of autonomy it needed to fight World War II. In July Under Secretary of War Robert P. Patterson announced a major shuffling of air officers in an effort, he stated, to get the best officers for the job into the right positions. Under these changes, Maj. Gen. Herbert A. Dargue took command of First Air Force at Mitchel Field, New York, Maj. Gen. Millard F. Harmon, Second Air Force at Fort George Wright near Spokane, Washington, newly-promoted Major General Brereton, Third Air Force at Tampa, Florida, and Brig. Gen. William O. Ryan, Fourth Air Force at Riverside, California.¹²⁵

At Third Air Force, Brereton continued the work he had begun with the 17th Bombardment Wing. On September 15, 1941, the largest prewar maneuvers took place in Louisiana and Texas between the Second and Third Armies, comprising between 350,000 and 400,000 men. Second Army consisted of six infantry divisions, one cavalry division, and one armored division, while Third Army fielded nine infantry divisions, one cavalry division, and one armored division. The U.S. Army Air Forces supported Second Army with the 2d Air Task Force, consisting of the 17th Bombardment Wing and 6th Pursuit Wing, under General Harmon, and Third Army with the 3d Air Task Force, consisting of the 2d Bombardment Wing and 10th Pursuit Wing, under General Dargue. One of the goals of the Louisiana and the subsequent Carolina Maneuvers was to test air support tactics





and doctrine preparatory to preparation of a field manual to govern air-ground operations. Although the Director of GHQ Maneuvers praised the per-

formance of both air task forces, Brereton regarded his experience during the Louisiana Maneuvers as unsuccessful.¹²⁶ Third Air Force's responsibility was to establish and operate two Air Corps maintenance commands, and he later wrote that his staff was untrained and his force poorly equipped. His own lack of maintenance experience also hurt. As a result: "We simply could not put supplies in the places where they should be and in the quantities required."¹²⁷

Despite Brereton's critical assessment, the Louisiana Maneuvers validated much of the U.S. Army's air-ground doctrine and techniques. The Carolina Maneuvers, which were scheduled to kick off on November 16, would provide additional validation, and, ultimately, provide a significant stepping stone to the publication of Field Manual 31-35 "Aviation in Support of Ground Forces" on April 9, 1942,¹²⁸ a document for which Brereton could justly claim some credit. The Carolina Maneuvers also promised an opportunity for Third Air Force to redeem its performance in Louisiana, but Brereton would not be there to see that take place. A rapidly cascading chain of events in the spring, summer, and fall of 1941 had modified the U.S.'s geopolitical position in world affairs, accelerated the rush to war, and altered Brereton's career radically. By the time Third Air Force entered the Carolina Maneuvers, Lewis Brereton would be half-a-world away in the Philippine Islands. n

NOTES

1. Allison Ind, *Bataan: The Judgment Seat* (New York: The Macmillan Company, 1944), p. 64.
2. William H. Bartsch, *Doomed at the Start* (College Station: Texas A&M University Press, 1992), p. 25.
3. Ind, *Bataan*, p. 29.
4. *Ibid.* p. 64.
5. Hanson W. Baldwin, "General Brereton's Personal Notes on the War in the Air," *New York Times Book Review* (October 13, 1946), Section 7, p. 20.
6. *Ibid.*
7. *Ibid.*
8. *Ibid.*; Lewis H. Brereton, *The Brereton Diaries: The War in the Air in the Pacific, Middle East and Europe, 3 October 1941-8 May 1945* (New York: William Morrow and Company, 1946); Roger A. Beaumont, "Faded Reputation: Brereton of the Allied Airborne Army," *Airborne Quarterly* (Winter 1968/69), pp. 20-23.
9. Beaumont, "Faded Reputation," pp. 22-23. The quotation is on p. 23.
10. The most important of these is Clare Boothe Luce, "Brereton," *Life Magazine* (June 1, 1942), pp. 66-68, 71-72, 74-76.
11. Robert F. Futrell, "Air Hostilities in the Philippines, 8 December 1941," *Air University Review* (Jan.-Feb. 1965), pp. 33-45. Watson wrote the section on "Pearl Harbor and Clark Field" in the official history, Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II*, Vol. I, *Plans and Early Operations, January 1939 to August 1942*, New Imprint (Washington, D.C.: Office of Air Force History, 1983), pp. 194-233; Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York: Random House, 1993);

- Geoffrey Perret, *Old Soldiers Never Die: The Life of Douglas MacArthur* (New York: Random House, 1996), pp. 247-48; 253; Geoffrey Perret, "My Search for Douglas MacArthur," *American Heritage* (Feb. 1996), pp. 74-78; William H. Bartsch, "Was MacArthur Ill-Served by His Air Force Commanders in the Philippines?" *Air Power History* (Summer 1997), pp. 44-63.
12. Brereton appears to have refused to speak with at least one writer about the events in the Philippines on December 8. See Walter D. Edmonds, *They Fought With What They Had: The Story of the Army Air Forces in the Southwest Pacific, 1941-1942*, Reprint (Washington, D.C.: Center for Air Force History, 1992), p. 91.
13. "Obituary; Lewis Hyde Brereton," *Shipmate* (September/October 1967), in Lewis H. Brereton File; "Obituary; William Denny Brereton, Jr." William Denny Brereton, Jr. File, U.S. Naval Academy Library, Annapolis, Maryland; Ltr, Lt. M. S. Tisdale, Air to the Superintendent, U.S. Naval Academy, to Maj. Lewis H. Brereton, HQ 10th Group (School), Kelly Field, Texas, September 12, 1922. 201 File, Lewis Hyde Brereton. Military Personnel Records, National Personnel Records Center, St. Louis, Missouri.; Luce, "Brereton," pp. 74-75.
14. *U.S. Naval Academy Annual Registers, 1911* (U.S. Naval Academy Library, Annapolis, Maryland).
15. *Lucky Bag*, 1911 (U.S. Naval Academy Library).
16. *U.S. Naval Academy Annual Registers, 1911* (U.S. Naval Academy Library, Annapolis, Maryland); Luce, "Brereton," p. 75.
17. "Brereton '11," *Shipmate* (February 1943), p. 47; Luce, "Brereton," p. 75.
18. Brereton, *The Brereton Diaries*, p. 17fn.

19. Ltr, Midshipman 1st Class L. H. Brereton to The Secretary of the Navy, March 6, 1911, with endorsements. (Records, U.S. Naval Academy Library, Annapolis, Maryland).
20. Medical Records, (Official Records, U.S. Naval Academy Library, Annapolis, Maryland); Ltr, Lt. M. S. Tisdale, Air to the Superintendent, U.S. Naval Academy, to Maj. Lewis H. Brereton, HQ 10th Group (School), Kelly Field, Texas, September 12, 1922. 201 File. Special thanks to P. Jean Drew, M.D., PLC, Family Practitioner, Fairfax, Virginia, who commented on Brereton's medical records at my request.
21. Summary of Efficiency Reports, 1911-1913, 201 File.
22. Ltr, 2d Lt. Lewis H. Brereton, to Adjutant General, U.S. Army, subj: Application for Detail in Aviation Section of the Signal Corps, September 26, 1916, with endorsements, *ibid*; Juliette A. Hennessey, *The United States Army Air Arm, April 1861 to April 1917*, New Imprint (Washington, D.C.: Office of Air Force History, 1985), pp.58-60, 226-31, 237; Charles deForest Chandler and Frank P. Lahm, *How Our Army Grew Wings: Airmen and Aircraft Before 1914* (New York: The Ronald Press Company, 1943), pp. 240-41; Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington, D.C.: Air Force History and Museums Program, 1999), p. 58.
23. Ltr, 2nd Lt. Lewis H. Brereton, to Adjutant General, U.S. Army, subj: Application for Detail in Aviation Section of the Signal Corps, September 26, 1916, with endorsements. 201 File; Hennessey, *The United States Army Air Arm*, pp. 72, 87; Chandler and Lahm, *How Our Army Grew Wings*, pp. 262-83.
24. Orders and Assignment Section; Standing at Service Schools and in Examinations for Appointment and Promotion, nd; Ltr, 2nd Lt. Lewis H. Brereton, to Adjutant General, U.S. Army, subj: Application for Detail in Aviation Section of the Signal Corps, September 26, 1916, with endorsements; Ltr, 1st Lt. Lewis H. Brereton to Chief Signal Officer of the Army, subj: Orders, May 19, 1917; Special Orders, No. 148, War Department, June 27, 1917; Proceedings of a Board of Officers Appointed by Paragraph 63, Special orders 134, War Department, June 11, 1917; Report of Board, June 16, 1917, all in 201 File; Obituary, *New York Times*, July 21, 1967; Luce, "Brereton," p. 76; Biographical Sketch, "Lewis H. Brereton," nd, Lewis H. Brereton Papers, Dwight D. Eisenhower Library, Abilene, Kansas.
25. Officer Efficiency Report, June 30-September 30, 1917; Special Orders, No. 78, War Department, April 3, 1918; Office Memorandum No. 146, Office of the Chief Signal Officer, October 1, 1917; Special Orders No. 45, Headquarters, Third Aviation Instruction Center, February 16, 1918; Orders No. 24, Headquarters of the Rear, March 11, 1918; all in 201 File; "Brereton '11," *Shipmate* (February, 1943), p. 47; John F. Shiner, *Foulois and the U.S. Army Air Corps, 1931-1935* (Washington, D.C.: Office of Air Force History, 1983), pp. 8-9; James, J. Sloan, Jr., *Wings of Honor: American Airmen in World War I* (Atglen, Penn.: Schiffer Military/Aviation History, 1994), p. 147.
26. "The Twelfth Aero Squadron: An Historical Sketch," nd. Series E, Vol. 3, Roll 16, Microcopy No. 619, "Colonel Gorrell's History of the U.S. Army Air Service," The National Archives and Record Service, Washington, D.C., hereafter cited as Gorrell; James J. Sloan, Jr., *Wings of Honor: American Airmen in World War I* (Schiffer Military/Aviation History, Atglen, Pa., 1994), p. 147; John H. Morrow, Jr., *The Great War in the Air: Military Aviation from 1909 to 1921* (Washington, D.C.: Smithsonian Institution Press, 1993), pp. 142-43, 147, 204.
27. Elmer Haslett, *Luck on the Wing: Thirteen Stories of a Sky Spy* (New York: E. P. Dutton & Company, 1920), pp. 32-33.
28. *Ibid.*, pp. 33-35; "The Twelfth Aero Squadron: An Historical Sketch," nd. Series E, Vol. 3, Roll 16, Gorrell.
29. Haslett, *Luck on the Wing*, pp. 27-32. Quotes on pp. 31-32.
30. Sloan, *Wings of Honor*, p. 149.
31. Haslett, *Luck on the Wing*, p. 73.
32. *Ibid.*, pp. 59-60.
33. *Ibid.*, pp. 60-61.
34. Ltr, Brereton, C.A.S., First Army Corps [?], to C.A.S., Zone of Advance, subj: Difficulties Encountered During the Recent Offensive, Aug 10, 1918, File General Correspondence, 1918, Box 6, Papers of William Mitchell, LC.
35. Typescript journal, p. 184, Box 1, *ibid*
36. *Ibid.*, p. 178.
37. *Ibid.*, p. 227.
38. General Orders No. 1, Headquarters, Chief of Air Service, 1st Army, August 28, 1918. 201 File; Ltr, Col. William Mitchell, Chief of Air Service, First Army, to Major Brereton, Commander, Corps Observation Wing, First Army, subj: Duties of Wing Commander, etc., Aug. 20, 1918; "History of 1st Army Observation Wing," Series C, Vol. 7, Roll 13, Gorrell; Sloan, *Wings of Honor*, p. 310. Brereton left the 12th Aero Squadron on July 1, joining the air staff of the I Army Corps. "The Twelfth Aero Squadron: An Historical Sketch," nd. Series E, Vol. 3, Roll 16, Gorrell.
39. Brig. Gen. William Mitchell to Commander-in-Chief, A.E.F., subj: DECORATION, November 21, 1918, with endorsements. 210 File.
40. General Orders No. 1, Headquarters Air Service, Group of Armies, A.E.F., October 25, 1918. 201 File. October 25 was the official date of the changes, which probably took place on the 21st. Daily Journal of Chief of Air Service, Army Group, October 1 to 30, 1918, Box 39, Papers of William Mitchell, LC.
41. Award of Distinguished Flying Cross, 201 File.
42. Quoted in "Brereton '11," *Shipmate* (February 1943), p. 47.
43. Biography, "Lewis Hyde Brereton," [c. 1947], File: Biographical Sketches and Ancestry, and War Dept. Special Orders No. 95-0, April 23, 1919, File: Correspondence and Certificates Re. Commission, Awards, Commendations, Lewis H. Brereton Papers, Eisenhower Library; Ltr, Maj. L. H. Brereton to the Adjutant General, subj: Award of the Purple Heart, April 9, 1932, and Ltr, Lt. Gen. Lewis H. Brereton, Ret., to Col. L. L. Judge, Air Adj. Gen., August 31, 1949, in 201 File; Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, D.C.: Center for Air Force History, 1993), pp. 14-16, 678fn; Philip K. Robles, *United States Military Medals and Ribbons* (Rutland, Vermont: Charles E. Tuttle Company, 1971), p. 57; Thomas J. Nier, *AEF Award Certificates* (Ft. Myer, Virginia: Planchet Press, 1990), p. 38.
44. Special Orders No. 323, Headquarters, A.E.F., November 19, 1918. 210 File; Daily Journal of Chief of Air Service, Third Army, November 1 to 30; December to 31, 1918, Box 39, Papers of William Mitchell, LC.
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47. Typescript, "Recommendations Submitted by Gen Mitchell, 1919," nd, File Coast Defense-Plans and Functions of Army and Navy, Box 36, Papers of William

Mitchell, LC.

48. Memo, Lt Col. L. H. Brereton, Chief, Air Service Operations, subj: Duplication of Activities of the Navy and Army, June 19, 1919, File Miscellaneous Papers to be Use in Courts-Martial, Box 37, Papers of William Mitchell, LC.

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50. Off. of Dir. of A.S., Personnel Orders, No. 69, May 29, 1919; No. 73, June 4, 1919; No. 89, June 23, 1919; No. 109, July 17, 1919, 201 File.

51. Ltr, Col. H. H. Arnold, HQ Western Department, to Mitchell, July 31, 1919, File General Correspondence, May-July 1919, Box 7, Papers of William Mitchell, LC.

52. James P. Tate, *The Army and Its Air Corps, Army Policy Toward Aviation, 1919-1941* (Maxwell AFB, Alabama: Air University Press, 1998), pp. 7, 14; "National Defense Act of June 4, 1920," 41 Stat 227; Special Orders No. 214-0, War Department, September 11, 1920. 201 File; "Lewis Hyde Brereton," File: Biographical Sketches and Ancestry, Lewis H. Brereton Papers, Eisenhower Library; Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, D.C.: Center for Air Force History, 1993), pp. 8-9.

53. Special Orders No. 165-0, War Department, July 16, 1919. 201 File.

54. Memorandum for Administrative Group by Brig. Gen. William Mitchell, Chief, Training & Operations Group, July 16, 1919, *ibid*.

55. Personnel Orders No. 111, Air Service, July 19, 1919; Ltr, Maj. Gen. Charles T. Menoher, Dir, Air Service, to Gen. Charles H. Muir, Cmdt, Army Service Schools, August 13, 1919; Ltr, Gen. Charles H. Muir, Cmdt, Army Service Schools, to Maj. Gen. Charles T. Menoher, Dir, Air Service, August 16, 1919, all in *ibid*.

56. Special Orders No. 256-0, War Department, November 1, 1919, *ibid*.

57. Beaumont, "Faded Reputation," pp. 20-23.

58. Officer Efficiency Report, November 1-December 31, 1919, 201 File.

59. Luce, "Brereton," pp. 75-76.

60. Memo, Col. Oscar Westover, Asst. Exec., A.S., to General Menoher, June 26, 1919, File General Correspondence, May-June 1919, Box 7, Papers of William Mitchell, LC.

61. *Ibid*.

62. See, for example, Cooke, *U.S. Air Service in the Great War*, pp. 80, 123, 191.

63. Burke Davis, *The Billy Mitchell Affair* (New York: Random House, 1967), pp. 134-35; Officer Efficiency Reports, January 1-December 31, 1920, January 1-June 30, 1921, July 1-June 15, 1922, 201 File..

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65. Ltr, Mitchell to Patrick, Feb. 10, 1923, File General Correspondence, 1925 (1 of 7), Box 11, Papers of William Mitchell, LC. "GA" stood for ground attack. The 3d Attack Group actually flew the GA-1, a development of the G.A.X. (the term Mitchell actually used in his report). James C. Fahey, *U.S. Army Aircraft, 1908-1946* (Falls Church, Va.: Ships and Aircraft, 1964), pp. 14, 16.

66. Intvw, Gen. Emmett "Rosie" O'Donnell, Jr., March 27, 1970, p. 24, Box 73, Hap Arnold-The Murray Green Papers, AFAL.

67. Report to the Adjutant General, May 15, 1923, 201 File.

68. Officer Efficiency Report, August 15, 1922-January 16, 1923, *ibid*.

69. Officer Efficiency Report, February 5-June 30,

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74. Special Efficiency Report for Regular Officers, November 28, 1919, 201 File.

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77. Ltr, Maj. Lewis H. Brereton to the C.A.C., subj: Relief as Member of Board, January 3, 1927, with endorsements. 201 File.

78. Maj. Gen. Mason M. Patrick, Cmdr., A.S., endorsement to *ibid*.

79. Ltr, Maj. Lewis H. Brereton to C.A.C., subj: Suppression of Leave Privilege, February 23, 1927, with endorsements. 201 File.

80. Officer Efficiency Report, October 13, 1925-July 1, 1926, *ibid*.

81. Ltr, Maj. Lewis H. Brereton to Cmd. Officer, Langley Field, subj: Request for Sick Leave, February 22, 1927, with endorsements, *ibid*.

82. Maj. Benjamin B. Warriner, Medical Corps, endorsement to Ltr, Maj. Lewis H. Brereton to Cmd. Officer, Langley Field, subj: Request for Sick Leave, February 22, 1927, with endorsements, *ibid*.

83. Ltr, Maj. Lewis H. Brereton to Commanding Officer, Langley Field, subj: Request for Sick Leave, June 6, 1927; Ltr, Dr. A. A. Brill to Capt. I. F. Peak, Station Hospital, Langley Field, June 2, 1927, *ibid*. The report on the April 7 accident is in the 201 File. A prominent Austrian-born, American-educated psychoanalyst, Abraham Arden Brill lectured on normal and abnormal psychology at Columbia University.

84. Ltr, Maj. Lewis H. Brereton to Commanding Officer, Langley Field, subj: Request for Sick Leave, June 6, 1927; Memo to: The Station Surgeon, Re: Major Louis [sic] H. Brereton, A.C., June 17, 1927; Memorandum for General Patrick Relative to Major L. H. Brereton, A.C., by Lt. Col. L. M. Hathaway, Chief, Medical Section, A.C., June 18, 1927, *ibid*; *Air Corps News Letter*, June 8, 1927, p. 173. Brereton and his wife divorced in 1929. Obituary, *New York Times*, July 21, 1967.

85. Memorandum for General Patrick Relative to Major L. H. Brereton, A.C., by Lt. Col. L. M. Hathaway, Chief, Medical Section, A.C., June 18, 1927. 201 File.

86. Memo to: The Station Surgeon, Re: Major Louis [sic] H. Brereton, A.C., June 17, 1927, *ibid*.

87. Ltr, Lt. Col. B. F. Browne, Inspector Generals Department, to Commanding General, Third Corps Area, subj: Investigation Concerning the Action of Major Lewis H. Brereton, Air Corps, in Abandoning His Command at Bolling Field, District of Columbia, at the Time of the Reception of Colonel Lindbergh About June 11, 1927, dtd. July 22, 1927, *ibid*.

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- 89.** Ltr, Maj. Lewis H. Brereton, to C.A.C., subj: Disciplinary Action in the Case of Major L. H. Brereton, Air Corps, for Unauthorized Absence from Duties in Connection With the Reception of Colonel Lindbergh at Washington, D.C., August 12, 1927, *ibid*.
- 90.** Letter of Reprimand, to Maj. Lewis H. Brereton, September 27, 1927, *ibid*.
- 91.** Personnel Orders No. 144, War Department, June 21, 1927; Ltr, Capt. William Hale, Adjutant, Langley Field, to Maj. Lewis H. Brereton, subj: Removal from Temporary Suspension from Flying, August 12, 1927; Ltr, Brig. Gen. H. H. Arnold to Col. Lewis H. Brereton, December 2, 1927, *ibid*.
- 92.** Intvw, Maj. Gen. John W. Sessums, Jr., p. 23, K239.0512-951, AFHRA, Maxwell AFB, Ala.
- 93.** Ltr, Maj. Gen. Preston Brown, Cmd., First Corps Area, to Maj. Gen. James E. Fechet, C.A.C., April 13, 1928. 201 File.
- 94.** Obituary, *New York Times*, July 21, 1967; "Lt. Gen. Brereton to Wed London Woman Thursday," *The Sunday Star* [Washington, D.C.], (Brereton File, U.S. Naval Academy Library, Annapolis, Maryland); Luce, "Brereton," p. 76; Gen. Douglas MacArthur, CofS, to Cmd. Off., 88th Observation Squadron, subj: Commendation, June 17, 1931, File: Correspondence and Certificates . . . , Lewis H. Brereton Papers, Eisenhower Library.
- 95.** Officer Efficiency Report and endorsement, July 1, 1929-June 30, 1930, in 201 File.
- 96.** Intvw, Maj. Gen. John W. Sessums, Jr., pp. 23, 28.
- 97.** *Ibid.*, pp. 42-44, 48.
- 98.** "Report on Accident yo [sic] Boeing P-12B at Mandingo River, Canal Zone, Piloted by L. H. Brereton, [22 Jn 1932]," w/atchs, 200.3912-1, AFHRA.
- 99.** Officer Efficiency Report, July 1, 1931-June 30, 1932, 201 File.
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Navy Buys Computer, Discovers Reliability: A Personal Account





John Coutinho

(Overleaf) Admirals Smith and Coates sit at the head of the table of the first BIM-RAB Board meeting. The author is seated third from the right. (All photos courtesy of the author.)

IN 1956, THE U.S. NAVAL AVIATION SAFETY CENTER IN NORFOLK, VIRGINIA, WAS ALLOTTED A NEW, MODERN MAINFRAME COMPUTER

FOR THE FIRST TIME CORRELATIONS COULD BE MADE OF MANY ACCIDENT RELATED ISSUES

THE PROBLEM WAS URGENT BECAUSE THE COST OF ACCIDENTS WAS RISING RAPIDLY

Flight Accident Data

In 1956, the U.S. Naval Aviation Safety Center in Norfolk, Virginia, was allotted a new, modern mainframe computer into which it began to enter all of its aircraft flight accident data. The outputs this computer made possible were truly wondrous. For the first time correlations could be made of many accident related issues. This capability led to a remarkable consequence, something completely new and unexpected—a Navy reliability engineering program.

The Safety Center called a meeting in December 1957,¹ inviting the entire aircraft industry and associated government agencies to come and admire its new “toy.” The Safety Center’s presentation identified different types of accidents caused by defects in various types of equipment. Contractors were asked to study this information and use it to design safer airplanes. The problem was urgent because the cost of accidents was rising rapidly, and the Navy did not have sufficient funds to replace the aircraft it had lost as a result.

I attended this meeting as a representative of the Grumman Aircraft Engineering Corporation, where I worked as a senior structural design engineer. As liaison with the Department of the Navy, I had many contacts and was thoroughly knowledgeable in Navy procurement procedures. I stood up and stated that aircraft were being designed to comply with the specifications called for in a contract. Naval procurement procedures did not permit any deviation from these specifications. If the Navy was generating new safety insights and information, the data had to be processed and called out in Navy specifications before contractors could respond. I suggested that a joint Navy-industry board be formed and charged with performing these tasks. Rear Admiral Allen Smith, Jr., the director of the Safety Center, agreed and asked me to organize such a board.²

Organizing a Navy-industry Advisory Board

I called on Rear Admiral L. D. Coates, then Assistant Chief for Research, Development, Test

and Evaluation (RDT&E), Bureau of Naval Weapons (BuWeps), and briefed him on the December meeting. I invited Admiral Coates to serve as chairman of the proposed Navy-industry board, and he agreed. A group of division heads in BuWeps provided me with advice and guidance in drafting an organization chart, and Admiral Coates filled in the names. The result was a board of twelve top industry executives and BuWeps officers; they would meet twice a year and establish policy for using the accident report data compilations. A six-member executive committee, with BuWeps employees as chairman and secretary, would meet as often as necessary. I tentatively set up four committees: electronics, flight controls, power plants, and maintenance—these committees were to include both industry and Navy personnel, with a Navy employee serving as chairman in each case.

At annual conferences, the committees would report on what they were doing to industry and other government organizations. This forum provided industrial organizations, which had no representation on the committees, an opportunity to make inputs or express objections. Conference proceedings were to be published and provided to each attendee at or soon after the conference. I suggested naming it the BuWeps/Industry Material Reliability Advisory Board (BIMRAB).

Navy Action

I prepared a package that my advisors in BuWeps approved and submitted it to Admirals Smith and Coates. On Smith’s initiative, a joint meeting of the senior staffs of the Naval Aviation Safety Center and BuWeps was called in Washington. At the meeting, the Admirals sat side by side and Admiral Smith recited a long list of the Navy’s safety and reliability problems. Next, I presented all the aspects of my plan. These were thoroughly discussed, but nothing was changed. Smith then asked each man around the table to cast his vote. All voted in favor. Coates submitted the package to the Navy Legal Affairs Office, which subsequently approved it.

Coates assigned a BuWeps employee, Frank Snyder, to serve as BIMRAB secretary. Coates

From 1972 until his retirement in 1993, John Coutinho was a general engineer at the U.S. Army Materiel Systems Analysis Activity, Aberdeen Proving Ground, Maryland. He was employed by Grumman Aerospace Corporation from 1939 to 1972, where he began his career as a stress analyst and airframe designer. In 1954 he was the company’s first reliability analyst, in 1962 he became the reliability director for the lunar module, and later special assistant to the vice president. Dr. Coutinho earned a Master of Engineering degree from NYU and a Doctorate of Engineering from the Technical University of Berlin. From 1951 to 1960, he taught aircraft design at New York’s Polytechnic Institute. Among his signal achievements while with the Army was his work on battle-field damage assessment and repair; a program that restored and made useful abandoned weapons. Dr. Coutinho wrote three books and some 100 technical papers. He is a member of numerous technical associations, including ASME, ASQC, NYAS, AIAA, SAE, and IEEE; he has been honored with many awards, including NAVAIR’s Admiral Coates Award (1962) and Outstanding Service (1973), the NYAS Laskowitz Gold Medal (1964), ASQC’s Brumbaugh Award (1972), and ASME’s Centennial Medal (1980).

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also prepared a list of people whom he wanted to appoint to the board, the executive committee, and to the chairmanships of the four committees. He called the first meeting of the board that approved the proposed BIMRAB structure and made plans for an annual conference.

Coates succeeded in gathering around him the most competent technical men in the Navy aircraft business, all of them vice presidents for engineering in America's top aviation companies. Over the years, Coates's successors took the same care in sustaining the quality of board members.

The first annual BIMRAB conference was held in 1959 at the Cavalier Hotel, in Virginia Beach, Virginia.³ Snyder did all the clerical work for the conference, reporting to the executive committee. He arranged for security by the U.S. Marines and kept all BIMRAB records. Most of the papers presented were provided by the BIMRAB committees' reporting on their work. The rest came from the executive committee.

Three admirals attended the conference. Admiral W. O. Burch, the new director of the Naval Aviation Safety Center, had replaced Admiral Smith. Vice Admiral R. B. Pirie, Deputy Chief of Naval Operations (Air), was the banquet speaker. Admiral Coates was chairman. Industry was well represented too, as were the Army, Air Force, CAA, and later, NASA. Many people wanted to join the committees; there was no lack of manpower.

BIMRAB Gets Tough

At the board meeting, just after the fourth annual conference, there was general consensus that the Navy had done a good job of presenting its case, but that the response from industry had been unsatisfactory. Industry would not recognize the increasing severity of the environment in which the Navy operated, and where much equipment was failing.

Consequently, a new approach was indicated, concentrating on a list of the twelve largest contractors with the worst Navy maintenance records. Admiral F. L. Ashworth, Assistant Chief for RDT&E and chairman of the BIMRAB, wrote a letter to the presidents of these companies, inviting each to present a paper at the next BIMRAB conference, and suggesting that on his next trip to Washington, the president drop in for a chat at Ashworth's office.

Ashworth told each visiting executive that his staff had assembled some material that would help the visitor to prepare his presentation. Ashworth then called in two BuWeps employees and introduced them. The BuWeps men would take the visitor to their office, where they would have the failure and maintenance history of the visitor's device on display. Most visitors had never before seen this information, and they found it difficult to believe. Then, after a thorough discussion of the data, the visitor was asked to write a paper explaining what his company planned to do

to correct these deficiencies. He was invited to come back in a month with his paper for Ashworth's review.

Company presidents do not write their own speeches. Typically, on his return home the visitor would call his public relations officer to write a paper for him. Public relations would produce a paper extolling the superior qualities of his company's products. At the next review of the paper at BuWeps, Ashworth would immediately recognize what had happened and suggest that his visitor have another talk with his BuWeps experts. These men would compare the visitor's paper with the information on their failure and maintenance-problem charts, and the president of the contracting firm would profess to be highly embarrassed.

The BuWeps men would then go over their charts and data again, and outline what their visitor's paper should contain: a plan for redesigning the company's product to solve the problem. Eventually, the executive would realize that a committee of his various company department heads needed to prepare his outline, and he would return with a revised paper.

The Navy Gets Educated

Ashworth called for a pre-conference review of these specially invited papers on August 28-30, 1961.⁴ Each of the attending company presidents pointed out that he could not comply with the Navy's request for redesign of the equipment because of costs. The Navy's system of awarding contracts on the basis of competitive bidding resulted in contractors cutting their prices as much as they dared, because the lowest bidder had the best chance of winning the contract. The winning proposal represented what the contractor understood the Navy to require, not necessarily what the Navy really needed.

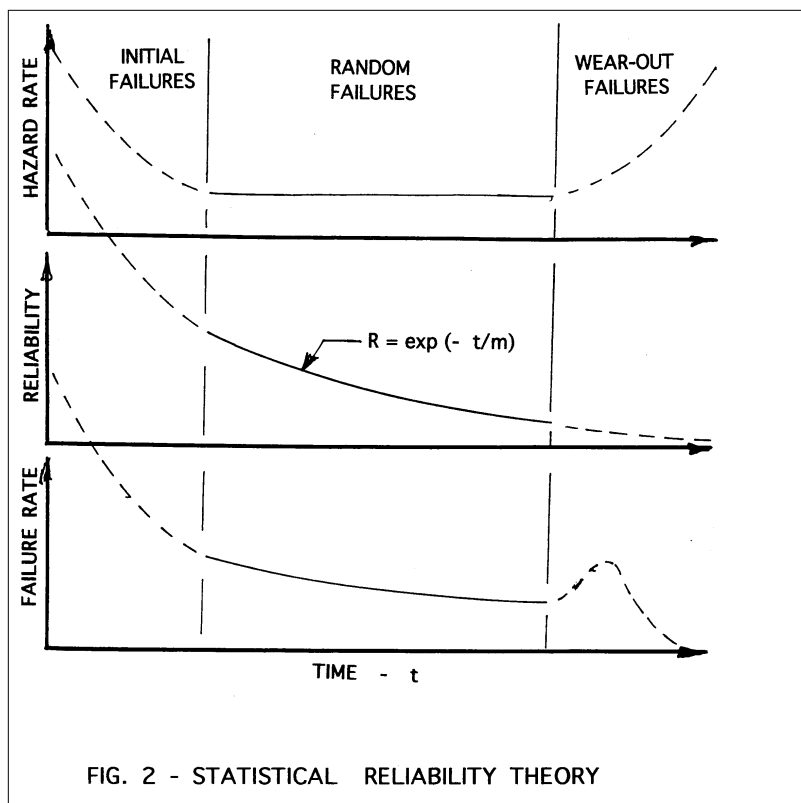
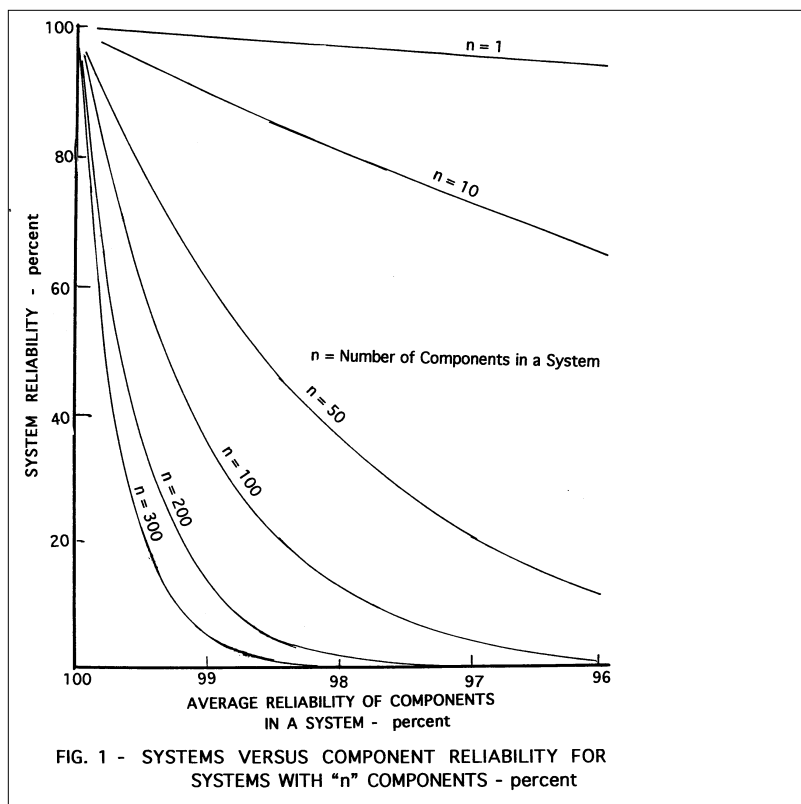
Ashworth and other officials monitored these discussions carefully and then held their own meeting. They reviewed the Safety Center's long list of reliability and safety problems. Other studies showed that the cost of redesigning equipment to prevent service breakdowns was orders of magnitude less than the cost of operating unreliable equipment that sometimes resulted in aborted missions. The admirals decided in the cases where a redesign would eliminate failures in service and reduce Navy operational costs, the Navy would move these funds forward into the procurement phase.

With this promise of funding, the company presidents agreed to redesign and retest as necessary to eliminate the BIMRAB reported failures, and report their progress in future presentations. This agreement represented a real breakthrough in Navy-industry relations.

The Fifth Conference

The Fifth Navy-Industry Conference on

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Material Reliability was held on November 1 and 2, 1961, at the Mayflower Hotel in Washington, D.C.⁵ Admiral Ashworth was the chairman and thirty-one other admirals attended. Rarely had so many high-ranking officers attended such an event, marking the occasion as one of extraordinary significance. The news that the Navy had

found a way to finance a reliability effort changed the entire atmosphere. There was a new feeling that Navy and industry were going to work together toward a common goal.

Most of the papers that Ashworth had sponsored described positive programs for redesigning equipment items with a history of failure so that they would no longer fail in service. These redesign efforts were the basic elements of reliability technology.

Other papers discussed the elements of a reliability program to be applied in the design phase, and how related requirements could be added to specifications. The Flight Controls Committee reported that it had included a requirement for a *failure analysis* in its flight controls design specification.⁶ The term "failure analysis" was later changed to "failure mode, effects and criticality analysis (FMECA)."

The Development of Reliability Technology

The development of reliability technology started in Germany during World War II. Among the German scientists captured at the end of the war by the U.S. Army was Robert Lusser, chief reliability engineer at the German rocket facility at Peenemunde. Lusser spent his time in the United States promoting the German accomplishments.⁷ His use of the product rule came to be generally accepted in the U.S., but his testing techniques were not adopted. The product rule applied to the reliability of a system consisting of a chain of independent components. That is, the simultaneous successful operation of all components is required for system success. Thus, components with a reliability of less than 1.0:

$$R_s = R_1 \times R_2 \times R_3 \dots R_n$$

Where: R_s = system reliability and R_n = component reliability

The effect of the product rule is shown in **Fig. 1**.

In 1953, RAND researcher Dr. R. R. Carhart published his statistical theory of reliability⁸ that included a formula for the reliability of systems and components based on their failure rate. [See **Fig. 2**] Carhart established the following definitions: A test will either succeed (S) or fail (F) as a function of time (t). For N(t) tests or trials: $N(t) = S(t) + F(t)$, where S(t) = number of successes over time and F(t) = number of failures over time.

Reliability: $R(t) = S(t)/N(t)$

Failure Rate: $Y = [1/N(t)] dF/dt$

Hazard Rate: $Z = [1/S(t)] dF/dt$

Constant Hazard: $Z = 1/m = \text{constant}$

where m=mean time between failure

Determining failure rates posed a difficult problem, however. As a start, Lou Jones and other computer experts at the Naval Aviation Safety

THE EMERGENCE OF LARGE SIZED, SOLID STATE ELECTRONIC EQUIPMENT SETS PRESENTED ANOTHER PROBLEM: NOBODY KNEW HOW TO TEST THEM

THE ... CONFERENCES OVER THE NEXT FEW YEARS FORMULATED THE BEGINNINGS OF A COMPREHENSIVE RELIABILITY ENGINEERING PROGRAM

Center, established new Navy reporting procedures to obtain empirical data. Using a form called a Failure or Unsatisfactory Report (FUR), the system relied upon control of replacement parts at a stockroom window. To obtain a needed replacement part, a mechanic had to fill out a preprinted postcard with the number of the part he needed, the tail-number of the airplane he was working on, and a short description of the failure. To requisition a new part for his stockroom, the clerk had to stamp the location and date on the card and mail it to the U.S. Navy Aeronautical Material Research Center in Philadelphia, where the information was encoded on IBM punch cards. The Navy was willing to supply each contractor with a monthly list of that company's parts that had been replaced throughout the fleet. Other sources in the Navy could furnish flight hours on the airplane type and individual aircraft. With these data, a contractor could compute a "replacement rate" on all his equipment items in service. This was not a failure rate as required by Carhart's equations, but it described a good portion of the requirement. As a result, contractors were now expected to expand their replacement rate data bases and come up with a serviceable approximation of failure rate for their equipment.

The emergence of large sized, solid state electronic equipment sets presented another problem: nobody knew how to test them. In 1957, Ed Nucci, a reliability engineer in the office of the Assistant Secretary of Defense, organized a committee, known as the Advisory Group on the Reliability of Electronic Equipment (AGREE), to seek a solution. The group classified the ranges of operational conditions encountered on aircraft, and it specified a new method of testing. The length of time that a part survived its operational loads became a measure of its reliability in that operational range. This unique concept was published in a report sponsored by the Office of the Assistant Secretary of Defense.⁹ Nucci circulated the report widely, and it had a big impact in the industry.

Armed with these three new tools: the product rule, the reliability equation, and the AGREE Report, the BIMRAB conferences over the next few years formulated the beginnings of a comprehensive reliability engineering program for all types of Navy equipment. The introduction of reliability engineering and design control techniques came at just the right time to support the development of the Grumman F-14 Tomcat fighter and other aircraft of its class. Reliability engineering was also an important contributing factor in our country's successful attempt to send two men to the moon and bring them back safely to earth.

The Influence of Authority

In the 1950s, BuWeps had about 3,500 employees, but only a small fraction of them were

involved in BIMRAB. The rank and file considered reliability to be just another passing fad, like "Zero Defects" and other such programs imposed from time to time by the Department of Defense. Furthermore, changes in specifications and inclusion of reliability requirements in contracts was something that the Navy leadership wanted, but that was strongly resisted by the rank and file of the conservative BuWeps bureaucracy.

In the first year of the conference three admirals attended. By the time of the fifth conference, there were thirty-two. This level of interest made it obvious to BuWeps employees that the next BuWeps commander would be no different than the present one insofar as reliability was concerned, and this had a very useful effect upon their acceptance of the concept. Moreover, the BIMRAB conferences were well attended by representatives of the Army, Air Force, CAA, and NASA, and so these representatives had a similar effect elsewhere within the government.

The BIMRAB Committees

The chairmen of the BIMRAB committees were BuWeps officers who had the authority to put committee recommendations into effect. The committees made contributions over a wide range of equipments that were presented and discussed at the annual conferences before they were adopted. There is not enough space to list them all, but I will mention one typical contribution from each committee.

The Flight Control Committee found that a major cause of failure of the power operated flight control system was the failure of the hydraulic pump. The committee developed a new pump specification that was presented at the next BIMRAB conference. There being no objections from industry, it was put into effect. The reliability of the new pump was remarkable. It saved the Navy millions of dollars and markedly improved aircraft readiness.

One of the concerns of the Power Plant Committee was engine inflight failures, often caused by a bearing breakdown. The committee postulated that as a bearing wore, it would release particles of metal into the oil. They organized an oil analysis program, where engine mechanics periodically sent small oil samples and associated flight hours documentation to a central laboratory that kept a running record on every engine in the Navy's inventory. The oil sample was analyzed spectrographically, the different kinds of metal particles were identified, and the density of each amount of particulate determined. The kinds of particles identified the bearing, and the density measured the wear. By plotting the density of particles against flight time, the laboratory could predict bearing wear and failure rates. If failure appeared imminent, the laboratory alerted the operator to change the engine. This program practically eliminated inflight engine failures. It is now mandatory on

An E-2C Hawkeye aircraft lands aboard an aircraft carrier during Operation Desert Storm.

THE E-2A USED ELECTRONIC TUBE TECHNOLOGY... IF SOLID STATE DEVICES WERE USED INSTEAD, ENGINEERS ESTIMATED THAT ITS RELIABILITY WOULD INCREASE

TODAY ILS IS A STANDARD REQUIREMENT ON ALL ARMY, NAVY, AND AIR FORCE AERONAUTICAL CONTRACTS



all military and commercial flights. The U.S. Army also uses these means to monitor tank engines.

One of the concerns of the Electronics Committee was that the Navy's new proposed electronic weapons increased the range of naval operations by hundreds of miles, but the equipment was highly unreliable. The committee recommended the use of integrated circuits. One such system under consideration was the Grumman E-2A "Hawkeye" early warning aircraft that carried 10,000 pounds of electronic equipment.¹⁰ The reliability required to maintain the scenario described in its mission analysis was 100 hours MTBF (mean time between failure, a measure of reliability).

The E-2A used electronic tube technology, and its best estimated reliability was on the order of three hours MTBF. If solid state devices were used instead, engineers estimated that its reliability would increase to about seventeen hours. The first E-2A required thirty days of preflight maintenance, but once in the air, its initial performance was remarkable. On the other hand, after an hour or two of flight, and even with the smoothest landing that a pilot could manage, nothing worked. Another month or more of maintenance was again required before the aircraft's electronics could return to the air.

The Navy wanted the "Hawkeye" badly. They issued an order for redesign using the latest solid state devices. The resulting E-2B had a reliability of about seventeen hours, just as predicted, not nearly enough for an operating weapon of the U.S. Navy. The Committee decided that the only

solution to save the E-2B was to redesign the system with integrated circuits. But industry was not ready, design concepts were not fully understood, and production would require expensive plant retooling. The chairman of the electronics committee, Col. Art Lowell, U.S. Marine Corps, visited these companies and convinced them to use integrated circuits. On its first few flights, the E-2C demonstrated a reliability of over 100 hours MTBF. It has now been in successful service in the armed services of the U.S. and several other countries for thirty years. The committee advanced the introduction of integrated circuits by many years.

The Maintenance Committee invented the concept of Integrated Logistic Support (ILS) and wrote a new Navy Design Specification, WR-30, ILS, later published as a MIL-STD.¹¹ However, Rear Admiral Emerson Fawkes, the BuWeps Assistant Chief for Maintenance, who felt strongly about WR-30, had no authority to approve a design specification standard—only RDT&E could do that. Admiral Fawkes did not want to transfer WR-30 to RDT&E because he felt that they did not have the technical maintenance background. Moreover, he was not confident that they would fully understand its need and he feared that RDT&E might change some of its provisions. But, when Admiral Fawkes became the Assistant Chief for RDT&E, his first action in that position was to sign WR-30. Since then a new discipline of logistics engineering has been developed to implement ILS. Today ILS is a standard requirement on all Army, Navy, and Air Force aeronautical contracts.



John Coutinho.

Dissolution

At the BIMRAB board meeting held after the first conference, BuWeps' Captain Walter Keen made a motion to recognize that all BIMRAB objectives had been achieved, and that the BIMRAB should be dissolved. After discussion, the motion was rejected, but a tradition had been established. At every board meeting held after every BIMRAB conference thereafter, such a motion was made, and after discussion, rejected. The exception finally occurred at the board meeting following the 1971 conference, when the motion was made, exhaustively discussed, and carried. BIMRAB was dissolved, and Frank Snyder deposited all the BIMRAB records in the Navy archives.

After fourteen years of spectacular BIMRAB operation, the board observed that reliability engineering had become standard operating procedure in the armed forces and in industry, and was now a required subject in aeronautic engineering schools. It appeared that nothing more could be achieved by BIMRAB.

BIMRAB wrote the specifications that established reliability engineering and ILS as contractual requirements on all aircraft operating systems. The concept that reliability was "just a passing fad" was no longer tenable. BIMRAB had been like a fireworks show. It was a burst of energy at a critical time in the development of electronics, jet engines, power operated flight control systems, and space flight. Dazzling progress had been made in a short time that changed the design engineering culture in the armed forces and in industry. When the job was done, BIMRAB fizzled out gracefully. n

NOTES

1. First Navy-Industry Conference on Aeronautical Material Safety and Reliability, Dec. 3-5, 1957, sponsored by and held at the Naval Aviation Safety Center, Norfolk, Virginia.
2. Ltr, Rear Admiral Allen Smith Jr., Director, Naval Aviation Safety Center, to John Coutinho, Jan. 8, 1958.
3. Third Navy Industry Conference on Aeronautical Material Reliability, Cavalier Hotel, Virginia Beach, Virginia. Sponsored by BIMRAB, 1959.
4. Ltr, Rear Admiral F. L. Ashworth, Assistant Chief for RDT&E, BuWeps, to John Coutinho, Subject: Fifth Navy Industry Conference on Material Reliability, invitation to participate in, Aug. 7, 1961.
5. Fifth Navy-Industry Conference on Material Reliability, Mayflower Hotel, Nov. 1 and 2, 1961, Washington, D. C. Sponsored by BIMRAB.
6. *General Specification for Design, Installa-*

- tion, and Test of Aircraft Flight Control Systems*, MIL-F-18372, Para. 3.5.2.3, Mar. 1955.
7. R. A. Lusser, *A Study of the Methods for Achieving Reliability of Guided Missiles*, Bureau of Aeronautics TR 75. U.S. Naval Air Missile Test Center, Point Mugu, Calif., Jul. 10, 1960.
8. R. R. Carhart, *A Survey of the Current Status of the Electrical Reliability Problem*, The Rand Corporation, Research Memorandum RM 1131. Aug. 14, 1953.
9. *Reliability of Military Electronic Equipment*, Advisory Group on the Reliability of Electronic Equipment (AGREE), Office of the Assistant Secretary of Defense (R&D), U. S. Government Printing Office, Jun. 1957.
10. R. Thruelsen, *The Grumman Story!* (New York: Praeger Publishers, New York, 1976), p. 306.
11. *Integrated Logistic Support Program Management*, MIL-STD 1369. Mar. 1971.

Sikorsky's



Fighters



Viktor P. Kulikov

(Overleaf) This S-16 had suffered wind damage in January 1916, and its engine was removed. Another damaged plane is on the left. (All photos courtesy of the author.)

IGOR SIKORSKY, IS WELL KNOWN FOR CREATING THE FOUR-ENGINE IL'YA MUROMETS ... HE IS LESS WELL KNOWN, HOWEVER, AS THE DESIGNER OF FIGHTERS

SIKORSKY INTENDED THE S-16 AS A TRAINING AND HIGH-SPEED RECONNAISSANCE AIRPLANE

The Russian airplane designer, Igor Sikorsky, is well known for creating the four-engine Il'ya Muromets bomber-reconnaissance aircraft in 1914, an achievement that marked the beginning of a new era in Russian aviation. He is less well known, however, as the designer of fighters. This article is dedicated to the history, construction, and use of Sikorsky fighters during World War I.

In late 1914, the aeronautical division of the Russian-Baltic Wagon Works (*Russko-Baltysky Vagonny Zavod (RBVZ) or Avia-Balt*)¹ completed construction of the first seven four-engine Il'ya Muromets B series. A delay in the turnout of the next series of airplanes allowed Sikorsky to use the time available to produce a new lightweight airplane—the S-16. Sikorsky relied on the experience gained during his design of the S-8 Maljutka in 1912. The S-8 was a two-seat training biplane powered by a 50-hp French Gnome rotary engine; the pilot's and student's seats were placed side-by-side and the airplane had dual controls. Indeed, the S-8 may be considered the prototype for the S-16, lending the latter some structural ideas and details. Sikorsky also acknowledged the influence of Sopwith's Tabloid. On the whole, the design work sought to reduce the S-16 airplane's size and simplify its structure.

Completed in October, the S-16 was a single-bay biplane, powered by an 80-hp Gnome rotary engine. On the two-seat version, the pilot's and observer's seats were located side-by-side. Its large wing area (25.36 square meters) and bulky Farman-type undercarriage were better suited for reconnaissance types than for fighters. However, the result was a plane that would perform both reconnaissance and fighter operations.

The S-16 also could be modified easily and thus appeared in various forms. One S-16, works number (No.) 156 for example, was equipped with a seven-cylinder Kalep engine and an upper wing area that was two meters larger than the lower wing. While the lower wings lacked ailerons, the upper wings contained greatly-enlarged ailerons. Sikorsky intended the S-16 as a training and high-speed reconnaissance airplane for the Airships Squadron (*Eskadra Vozdushnykh Korabley, or EVK*)—the unit formed by Il'ya Muromets. In December, the S-16s were detached from the army into a separate unit and subordinated to the Supreme Commander-in-Chief of Staff. Later, the S-16s were used to guard the airships' home airfields and as an escort fighter.

Meanwhile, in November, *Avia-Balt* had begun constructing three S-16 airplanes (Nos. 154, 155, and 156). The first of these, powered by a Le Rhone 80-hp engine, was completed in January 1915. It was sent to Revel and delivered to Imperial Navy

pilot Lt. Georgy Lavrov. But, deep snow prevented testing the airplane's wheels and undercarriage. In March, Lavrov and his S-16 were transferred to the Airships Squadron. On March 6, the other two S-16s were sent to the squadron's detachments in Jablonna and Warsaw. All three planes were tested under combat conditions and successfully passed their tests. During the summer, the Airships Squadron pilots continued to test the S-16 with the following results: speed—144 km/hr, and time to climb to 1,000 meters with full load (225 kg)—4 minutes. The tests persuaded the Central Military Technical Department to contract with *Avia-Balt* for the construction of fifteen S-16s (Nos. 201-215).

The Il'ya Muromets was the major product line of *Avia-Balt* and even a small production run of another airplane series posed concern. The main problem—affecting all of Russian aviation—involved severe shortages of engines and machine guns. German aircraft, on the other hand, were fully armed with synchronized and turret, ring-mounted machine guns. One indication of the acuteness of the situation was evident in a March 17 telegram from a Russian airplane inspector at the front: "there are no machine guns for small apparatus [S-16], only two airplanes have armament—one from the XIIth Army, another from the XIth." As a result, the majority of S-16s were sent to the Airships Squadron without them. Engines and armament were fitted at the squadron's workshops when they became available. Initially, the cost of production and ensuing difficulties posed seemed not to outweigh the evident advantages of the new airplane. Soon after the tests, Airships Squadron commander, General-Major M. V. Shidlovsky reported: "S-16 apparatus are the most high speed...equipped with the device for shooting through the propeller from [a] Vickers machine gun. [The] Sikorsky sixteenth, with [a] machine gun could be a serious threat to the enemy airplanes." At the beginning of 1916, the Airships Squadron received the first six fighters produced, while delivery of the remaining twelve was delayed. All of the airplane ordered were accepted, but their dispatch to front was postponed because of the lack of synchronized machine guns. When the first S-16 airplane arrived without armament, the Central Military Technical Department decided to equip the S-16 with Vickers or Colt machine guns. Airships Squadron Navy pilot Lt. Lavrov himself developed the synchronizer. In addition, some of the two-seat S-16s were equipped with a machine gun for rearward shooting.

Grand Duke Alexander Mikhailovich, the airplane and aeronautics commander of the Army in the Field, took an interest in the new S-16 lightweight fighter. At that time Airships Squadron

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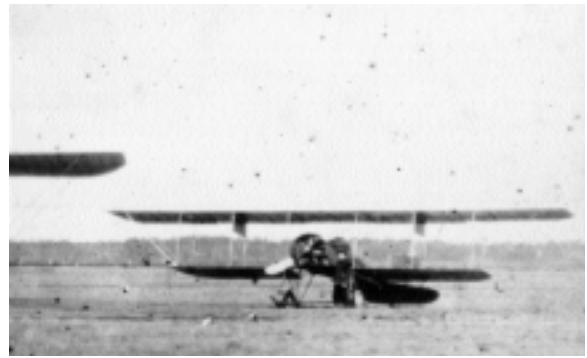


(Above) Igor Sikorsky (1889-1972).

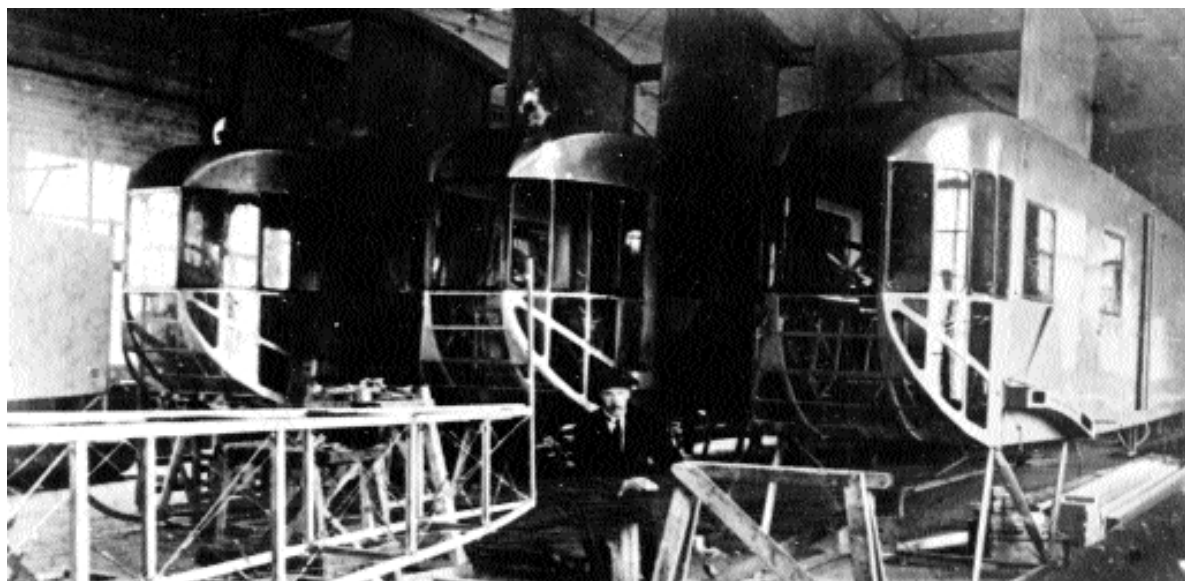
(Opposite column, top to bottom) (1) Some structural elements of dummy biplane S-8 called "Maljutka (Baby)" created in 1912 were used while designing the S-16; (2) last modification of S-10 equipped with Gnome-Monosoupape 100-hp engine only slightly differed from the first S-16; (3) the first S-16 (number 154) was produced in January 1915; (4) the second copy of S-16 (number 155) during test in summer 1915; (5) one of the first S-16, used as trainer aircraft in winter 1916.

heavy airplane were withdrawn from the Grand Duke's command and placed under the direct command of the Supreme Commander-in-Chief of Staff (*Verkhovnoe Glavnoe Komandovanie-VGK*). On February 3, the Grand Duke sent a telegram to Gen. M. V. Alekseev, the head of the VGK staff, demanding: "[why hasn't] the [S-16] squadron yet [been] sent to the VIIth and XIth Army.... [these planes] are the most high speed nowadays. Otherwise reconnaissance in the future would be impossible." Alekseev replied: "of twelve machines [on hand, we are] ready to let [activate] six." Soon, the first fighter air detachments, including the combat airplane necessary to equip them, were formed in Russia. Fighters were in small supply. Also, since the French-built Nieuport XI and Spad A.2s were delivered in limited numbers, the S-16's appearance seemed timely.

In February, *Avia-Balt* received the following telegram: "by [his] Imperial Majesty's order, pre-



Igor Sikorsky sits among partially assembled S-16s.



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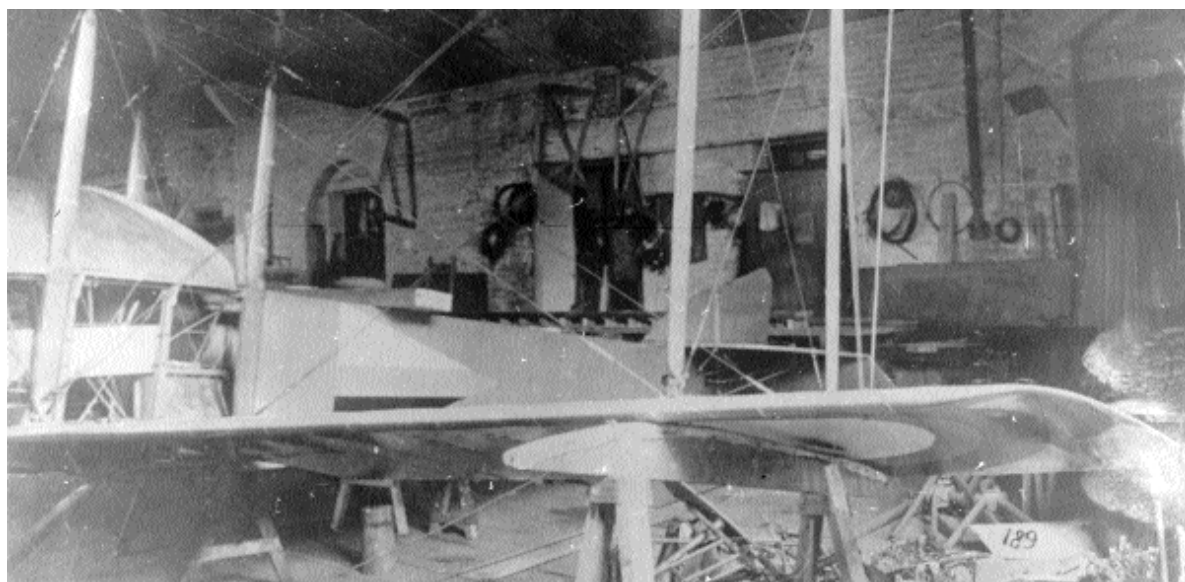
THERE WERE
SEVERAL
CASES OF
ENGINE
STOPPAGES
IN THE AIR

pare for the urgent departure to Zhmerinka for the 6th Air Company, three ready S-XVIs with machine gun installations for Gnome [engines and] Vickers [machine guns]. The aforesaid departure should be done no later than [the] 27th of February.” The airplanes (Nos. 201, 202, and 204) were accepted by 2d Lt. Ivan Orlov, recently appointed to command the new 7th Fighter Air Detachment, an element of the 6th Air Company, near Kiev. On March 19, three more S-16s, equipped with Gnome 80-hp engines and machine guns, were sent to Kiev for the 7th Fighter Air Detachment. The airplanes were enthusiastically accepted by the unit’s pilots. Test flights began in April, with Pilot Ensigns Gilsher and Matveevich flying aboard No. 201 and 2d Lt. Bychkov aboard No. 202. In all, they completed ten 25-minute-long flights over Jablonna airfield and soon became proficient with the new airplane and its capabilities. Lt. Orlov, flying No. 204, initiated combat patrols on April 15, but did not encounter any enemy airplanes. The S-16’s first combat took place on April 18. On that day Lieutenant Bychkov—with

Observer Ensign Kvasnikov aboard—took off, following signals from a ground observation station to intercept a hostile airplane in the region of Dobropole. Visibility was poor because of fog and a layer of clouds. Soon the pilots discovered the enemy, who began to fire. After several shots the enemy disappeared into the clouds and then descended towards their position. On April 20, a three-ship section of the 7th Fighter Air Detachment took off to intercept an enemy airplane. After being attacked, Orlov, Gilsher, and Bychkov drove the enemy back behind the front lines. During the days that followed, the 7th’s pilots engaged in air combat with enemy airplanes and each time forced them to retire behind the enemy’s lines.

During these operations, Russian pilots discovered some deficiencies in the synchronizing mechanism of the machine guns. Frequently during a crucial period of battle, the mechanism went “out of sync.” In April such cases were outlined in the reports of Ensign Gilsher, aboard No. 201 and Lieutenant Orlov, aboard No. 201 and 204. Also,

Assembly of the first serial copy of the S-16-3 in the summer of 1916.



An S-16-3 of the Red Army before flight. Note the cockade of the Russian Imperial Air Forces on the wing, winter 1920.



WHEN THE GRAND DUKE ... LEARNED OF THE CRASH, HE IMMEDIATELY SUSPENDED S-16 FLIGHTS

there were several cases of engine stoppages in the air, with some forced landings. On April 27, Lieutenant Bychkov, aboard No. 202, made a forced landing; his airplane was damaged and sent for repair.

That day four sorties took off in pursuit of hostile airplanes. On one mission, Ensign Gilsher attacked an airplane over Burkanov at an altitude of 2,500 meters. After expending 120 rounds, Gilsher shot down his opponent, who was last seen covered with dense smoke as the enemy plane dove to the ground. With Observer Ensign Kvasnikov aboard, Gilsher then took off again. Unable to locate the enemy, the Russians headed home; but while landing, their aileron control system jammed. The elevators were also jammed in the down position, locked by loss of rudder control. Thanks to the efforts of the pilot and observer, they managed to free the right elevator. Unfortunately, the left elevator remained jammed, causing the airplane to go into a spin and crash. Badly wounded, Gilsher and Kvasnikov were rushed to a hospital, where Gilsher's left foot was amputated.

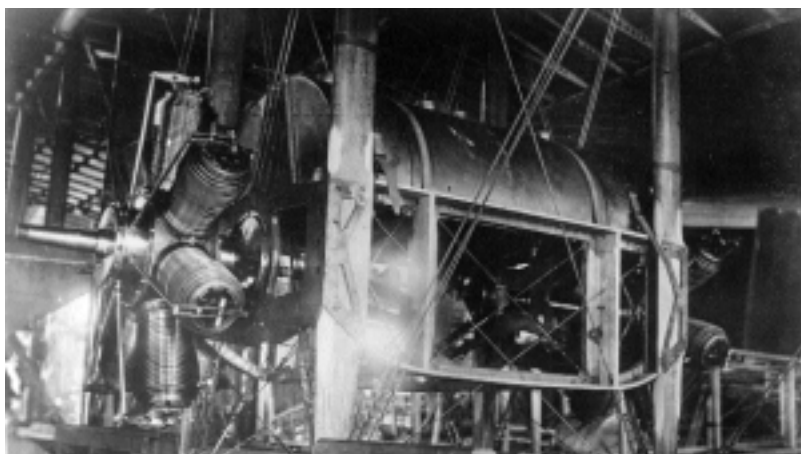
However, owing to his dogged persistence, Gilsher later managed not only to return to his detachment, but to fly again. Fitted with an artificial limb, Gilsher went on to win several more air battles.

When the Grand Duke Alexander Mikhailovich learned of the crash, he immediately suspended S-16 flights and ordered all of the aircraft returned to the Airships Squadron. At the same time that these mechanical problems arose, the pilots reported other deficiencies in the S-16s. Pilots of the 7th Fighter Air Detachment complained that the S-16 was much slower at level speed than the German Albatros, especially the latest types. The S-16's rate of climb was also considered unsatisfactory. It took fifteen minutes to climb 1,000 meters, fifty minutes to climb 2,000 meters, and a very slow hour and fifteen minutes to reach 2,500 meters. While airplane stability was acceptable, the S-16 was "sharply disturbed" in steep turns. Pilots from the 7th Fighter Air Detachment noted that some of the airplanes were poorly assembled, causing the failure of vital parts.

SOME OF THE AIRPLANES WERE POORLY ASSEMBLED, CAUSING THE FAILURE OF VITAL PARTS

Winter start of the S-16-3 in 1920.





(Top to bottom) (1) Two-seated biplane S-17 constructed in 1916 did not do well in testing and was never produced; (2) Twin-engined S-18 during tests in spring 1916 could not take off due to problems with its Sunbeam engines; (3) the tandem installation of two Gnome 80-hp engines in an S-18.

During the S-16's period of service, it experienced five synchronizer failures in the air. Delicately attached control levers and structural defects throughout the control system were also noted. Poor pilot visibility posed another serious disadvantage, making "the discovery of the enemy in the air almost [a] pure accident." In addition, the gun installation was unsatisfactory and aiming made impossible because of heavy engine vibration.

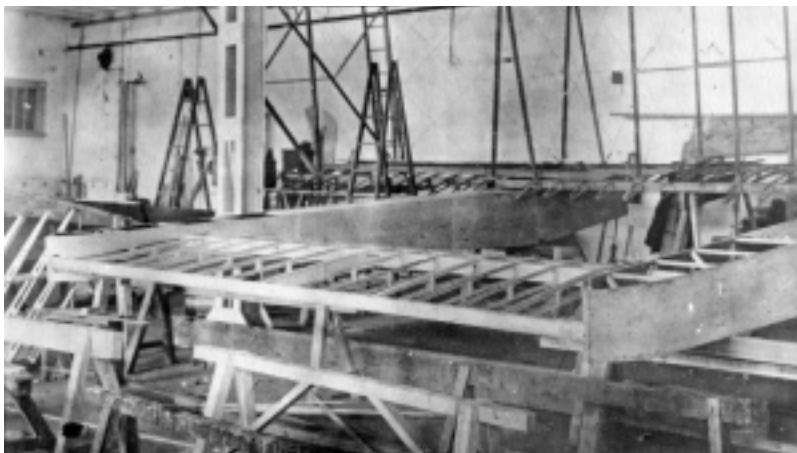
An investigative commission of the 7th Fighter Air Detachment concluded that "S-16 airplanes are appropriate neither for service as fighters nor for the flights in general...it is undoubtedly dangerous to fly that airplane." During their service with the 7th, between April 15 and May 5, 1916,

the three S-16s made twenty-seven flights. Twenty-two were combat flights, lasting a total of 30 hours, 47 minutes. During that period, one hostile airplane was shot down. After the crash on April 27th, S-16 No. 201 was taken out of service.

The reports were similar from other fronts. At the end of March 1916, S-16 No. 205, with the Le Rhone 80 hp engine and a synchronized machine gun, was delivered from the 7th Air Company to the 33d Corps Air Detachment (Northern front) for Military Pilot 2d Lt. Konstantin Vakulovsky. On March 27, Vakulovsky took off from the airfield in Kreitsburg to pursue a twin-engine German airplane. Vakulovsky attacked the enemy at an altitude of 3,400 meters in the region of Stockmanshof, but the German pilot flew off. On April 2, Vakulovsky flew a reconnaissance mission and was fired on by his own artillery. A projectile burst underneath his airplane stopped the engine. Shell-shocked, the pilot lost consciousness for a short time. When he came to, he began to glide and landed on a bog near Vikemujzhe. During the landing, the propeller was damaged and a wing strut crumpled. On April 28, the airplane was returned to the 7th's air park and its engines handed over to the 20th Corps Air Detachment. Thus, only two combat flights lasting two hours and fifteen minutes were made on S-16 No. 205.

Beginning April 5, 1916, two S-16s (Nos. 203 and 211), each equipped with a Gnome 80-hp engine, were used in the 12th Fighter Air Detachment of the Northern front. Military Pilot 2d Lt. Max Lerkhe, the detachment commander, flew the planes. After training flights on April 23, Lieutenant Lerkhe, with Observer Senior Non-commissioned Officer Kanavin aboard, made the first combat flight, but did not encounter any hostile airplanes. Similar flights were made on May 21 and 22. On June 21, Lerkhe pursued a German airplane above Kurtenhof. As Lerkhe approached the enemy, having overtaken him at a height of 210 meters, the German pilot immediately flew off, crossing the trenches near Bersemunde. On his way back to the airfield, Lerkhe noticed an Albatros in the region near Dalen Lake taking heavy fire from Russian batteries. Lerkhe attacked the Albatros from behind and was about to open machine gun fire, when the Albatros turned and Lerkhe noticed it bore Russian roundels. He quickly stopped his attack and returned to his airfield.²

The last S-16 was used in the 12th Fighter Air Detachment on June 26. On that day Lerkhe flew towards artillery bursts and found a hostile airplane directing fire towards the Russian trenches. He overtook the enemy near Baldon and attacked it, unloading his entire cartridge belt, with no effect. In his report, Lerkhe remarked that the S-16 "was not fit to serve as a fighter." On the whole, from April to June 1916, the 12th Fighter Air Detachment made five flights aboard S-16s. That summer the two airplanes (Nos. 203 and 211) were returned to the Airships Squadron at



(Top) S-19 in the course of construction in 1915.

(Above) The S-19 was equipped with tandem Sunbeam 150-hp engines.

(Right) Assembling the S-19 in a tent shed in the summer of 1916.



Zegevoid. Six other S-16s (Nos. 154-156, 207-209) remained in service in the Airships Squadron. Three were with the 2d Combat Detachment (Zegevoid) at the Northern front, two others with

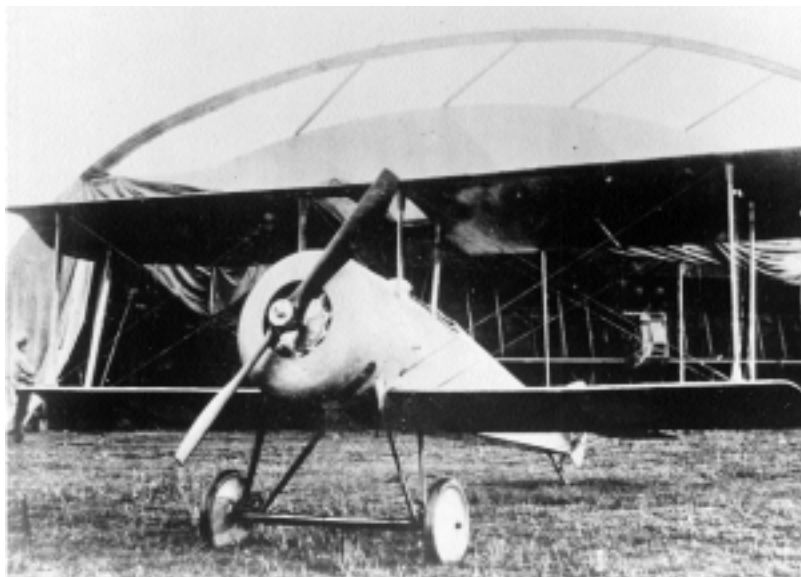
the 1st Combat Detachment (Kolodzia, Ternopol region) at the Southwest front, and one used for training at the Air Detachment Flying School in Pskov.

In the summer of 1916, when it became clear that the S-16's speed of 120 km/hr was insufficient for a fighter, a Gnome-Monosoupape 100-hp engine was installed on No. 210. The conversion raised the plane's speed to 154 km/hr. The next series of S-16 aircraft were prepared for that type of engine. The first of this S-16-3 series (No. 246) was delivered for testing to the Airships Squadron in August 1916. The new series was distinguished by a more streamlined form and the presence of an upper fuselage faring. The upper wing span was greater than the lower one, and the latter had no ailerons, while those of the upper wing were enlarged. The biplane was transformed into a sesquiplane, in compliance with the general development of fighters.³ The first of the new series—built in January 1917—was followed by fourteen more (Nos. 247-260), but none reached the front as they lacked engines. The Grand Duke refused to grant engines for the new series of S-16 fighters, so the last fourteen S-16-3 were stored in the assembly shop of *Avia-Balt* until May 1919.

After the October 1917 revolution, the Bolsheviks demobilized the Imperial Russian army, including the Airships Squadron, whose remnants were driven from the front deep into Russia. On December 23, 1918, the fourteen S-16-3 airplanes were stored at *Avia-Balt* were assembled and transferred to the Central Aircraft Depot in Moscow, where they were gradually equipped with engines and then sent to the Red Army. The new Red Army airplane formation was created as the Division of Airships (*Division Vozdushnykh Korably—DVK*). In July 1919, S-16-3 No. 247 was given to the Moscow Flying School but did not serve there long. Pilots in that school trained in specified types of aircraft that were in Red Army service; the S-16 was not among them.

In June 1919, S-16-3 No. 248 was delivered to the 38th Air Detachment, an element of the Byelorussian-Lithuanian Air Service, based near Orsha. Several flights were made there, but the airplane crashed during a forced landing in July. The White Army also used several of the airplanes during the Russian Civil War. Captain V. Lobov, a pilot from the 1st Kuban Cossack Air Detachment, flew one of them. Another S-16 was used by White Army pilots at the Sevastopol Flying School in the Crimea.

Two S-16-3s (Nos. 250 and 252) were sent from Moscow to Lipetsk, at the Division of Airships base. Airplanes Nos. 249, 251, 253-255, and 257 were not mentioned at all in the Division of Airships documents and most probably remained at the Central Aircraft Depot in Moscow. By January 1920, No. 250 had flown a total of one hour and thirty minutes. Damaged during a landing in February, the airplane was under repair until another engine was installed (a Le Rhone 80-hp). In May, the next crash completely wrote it off.



S-20 with Le Rhone 120-hp engine developed speeds up to 115 mph.

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INCLUDING
THE S-17,
S-18, S-19,
AND S-20

Similarly, No. 258 arrived at the Division of Airships on May 17, 1920. After assembling and mounting a Le Rhone 80-hp, it was sent by train to the front, where it was used during the summer of 1920 by the 1st Combat Detachment near Mogilev.

S-16-3 No. 252, with Le Rhone 80-hp, was sent to the Division of Airships base on June 25, and remained there until September 15, when it made its first test flight. The airplane was damaged by pilot Berezhkov. Although sent for repair, it was later written off. In December 1920 Nos. 256 and 259 arrived without engines at Sarapul from the Moscow Air Depot. But, before the planes could be assembled and tested, they were destroyed during a fire.

S-16-3 No. 260 had arrived at the Division of Airships in the spring of 1920, and was fitted with a Le Rhone 80-hp engine. The assembly of that airplane lasted for several months and test flights began in the autumn. In November 1920, the airplane crashed, having spent a total of two hours and twenty minutes in the air. Numbers 164 and 165 were also mentioned in the Division of Airships' documents, but in fact they were one and the same. Accepted in January 1920, the airplane was used for training flights until March, when it was damaged. After repair, the airplane was transferred to a training unit, where it was damaged, then returned to the Division of Airships and after the next crash written off. At the beginning of 1922—when the Division of Airships disbanded—all S-16-3s that were kept at the Central Aircraft Depot were written off, effectively ending the eight-year history of the S-16.

Other Sikorsky Fighters

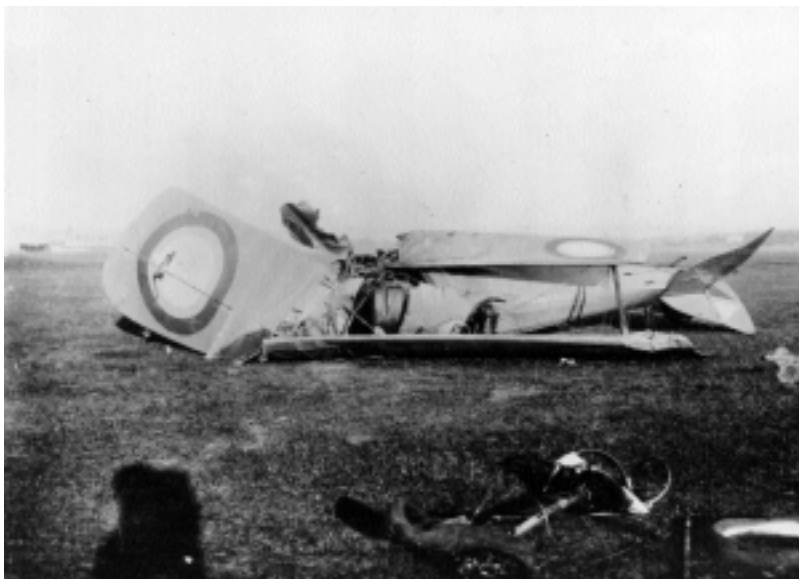
Sikorsky also designed several other aircraft types, including the S-17, S-18, S-19, and S-20. The S-17, a two-seat biplane equipped with the British Sunbeam 150-hp engine, was a reconnaissance and escort fighter for the Il'ya Muromets airships. Early in 1916, two copies of the machine

(Nos. 199 and 200) were built and purchased in April by the Military Department for 74,902 rubles (together with Sunbeam engines). Testing of these aircraft lasted almost half a year at the Corps airfield in Petrograd. On June 24, 1916, the two machines were sent to the Airships Squadron in Pskov. Pilot seats on the S-17 (according to unconfirmed data) were armored. The S-17 did not perform well in testing because of the poor performance of the engines and the type failed to enter serial production.

The S-18 was a two-seat, four-bay biplane, with two Sunbeam 150-hp engines mounted on the lower wing; the engines had pusher propellers. A gunner's cockpit was located at the front of the fuselage, the pilot's cockpit behind it. According to project records the airplane was intended to "serve as a fighter...[and] strike quick blows to an enemy who penetrated our territory." Two S-18s were built, the first (No. 216) was ready by April 27. When the airplane failed to take off with a full load, because of the underpowered Sunbeam engines, they were replaced with four Gnome 80-hp engines mounted in a twin tandem arrangement. On November 25, as the tests progressed, *Avia-Balt* shipped the airplane to the Airships Squadron in Vinnitsa where two French Hispano-Suiza 150-hp engines were to be installed. None, however, were available. In July 1917, the S-18 was returned to *Avia-Balt*, where the failure of the airplane was blamed on poor quality of the Sunbeam engines, which failed to generate the quoted capacity of 150-hp and often went out of order. The installation of four Gnome engines was a stopgap measure that also failed.

The S-19 was a twin fuselage biplane, with two Sunbeam 150-hp engines tandem mounted on the central part of the lower wing. Two versions of that machine (Nos. 261 and 262) were turned out in January 1916. Test flights of the S-19 began on April 26. On May 12, the two machines were sent to the Airships Squadron at Pskov. One airplane was damaged during the first test flight and engines from the other were cannibalized for the Il'ya Muromets. Later, two more S-19s were constructed (Nos. 263 and 264), and remained at the Corps airfield in Petrograd where they underwent testing until December 1916. The designation of this type remains unclear. Judging by records it could have been a medium bomber, reconnaissance, or escort fighter. But the absence of any protection from behind, and restricted capabilities for firing forward deprived it of any military value. In July 1917, the Airships Squadron returned the two S-19s, considering them useless for any kind of service.

The last light airplane created by Sikorsky in Russia was the single-seat S-20 biplane. It embodied all the experiences of the S-16 and considered the peculiarities of the best foreign fighters of the day. The S-20 was constructed without preliminary design or compilations of drawings. Sikorsky drew only sketches and gave personal instructions in the coursed construction. The upper wing had a



S-20 after a crash in July 1917.

SIKORSKY'S WORK WAS NOT AS SUCCESSFUL IN DESIGNING FIGHTERS AS HE WAS WITH THE HEAVY BOMBER

span of 8.2 meters and was somewhat larger than the lower wing. Ailerons were only on the upper wing. The Gnome-Monosoupape 100-hp engine was fully cowled and the airplane had a good streamlined appearance. Built in September 1916, the S-20 was first tested at the Corps airfield and at Gatchina Flying School near Petrograd. However, the engine's capacity also proved insufficient and the experimental S-20 was sent from *Avia-Balt* to the Airships Squadron on March 17, 1917, without engine or propeller, but with two pairs of wings of different sizes as options. The Airships Squadron head, General-Major Shidlovsky asked for a rotary Le Rhone 110-hp and Clerget 130-hp engines from the Central Military Technical Department. Sikorsky envisaged an S-20 variant, powered by a water-cooled, in-line Hispano-Suiza 150-hp engine. Instead, the Le Rhone 120-hp engine was fitted to the S-20 (No. 267). The first flight made by a military pilot of the Airships Squadron, Lt. V. A. Romanov and the tests were continued by Lt. Col. Robert Nizhevsky. The tests showed impressive results that matched the level of the foremost airplane designers of that time. Attaining a speed of 190 km/hr and practical ceiling (7,000 meters), the fighter was superior to most Nieuport fighters. The test pilots noted that in level flight the airplane climbed well, but lost speed while turning and went into a spin. It should be noted that the S-20 was tested without armament. The installation of

a synchronized machine gun slightly reduced the airplane's flight performance. *Avia-Balt* proposed to build a series of fifty S-20s, but that proposal was not supported by the Military Department. Shavrov claims that only five copies of the S-20 fighter were constructed, one of them a float version was never finished.⁴ The first S-20 was crashed by Lt. Nizhevsky on July 26, 1917, during landing in Vinnitsa. The cause of the crash was blamed on the airplane's poor longitudinal stability. The same defect also characterized other types designed by Sikorsky, the S-12 and S-16. In that case "during speed loss the airplane immediately stopped [sic] to obey the elevator and go into a spin," wrote Igor Sikorsky in his explanatory note to a commission organized in May 1917 by the Central Military Technical Department to test reliability of the Muromets.

In retrospect, Sikorsky's work was not as successful in designing fighters as he was with the heavy bomber. Perhaps because Sikorsky was pre-occupied with his work on the Il'ya Muromets, he found little time to pay equal attention to smaller airplanes. His S-20 fighter was the most successful, but the majority of his other fighter designs remained only as experimental airplane. The S-16 series did not meet Sikorsky's high hopes. In part, the failure stemmed from the poor quality of the engines provided. However, it was also due to irrational schemes, the refusal to search for new approaches, and to a number of structural defects. The disorganization of the Russian state caused by the revolutions of 1917, left few incentives to the airplane designer and in the spring of 1918 Sikorsky emigrated from Russia.

Unfortunately, no drawings of the S-16 have been found in the archives. The well-known Russian aviation historian Vadim Shavrov found that "tracing cloth with [a] general view of that airplane was laundered for clothes together with other airplane drawings of the *Avia-Balt* in the 1920s. So did the Red proletarians destroy valuable historical materials." A group of aviation enthusiasts has managed to construct two full-scale S-16 replicas on the basis of restored drawings. Their construction was fulfilled by one of the Moscow airplane factories and the new S-16s are destined for aircraft museums. At present one aircraft is almost ready; it will be equipped with a stationary, five-cylinder M-3 engine (the altered serial AIR-14) and should be able to fly. n

NOTES

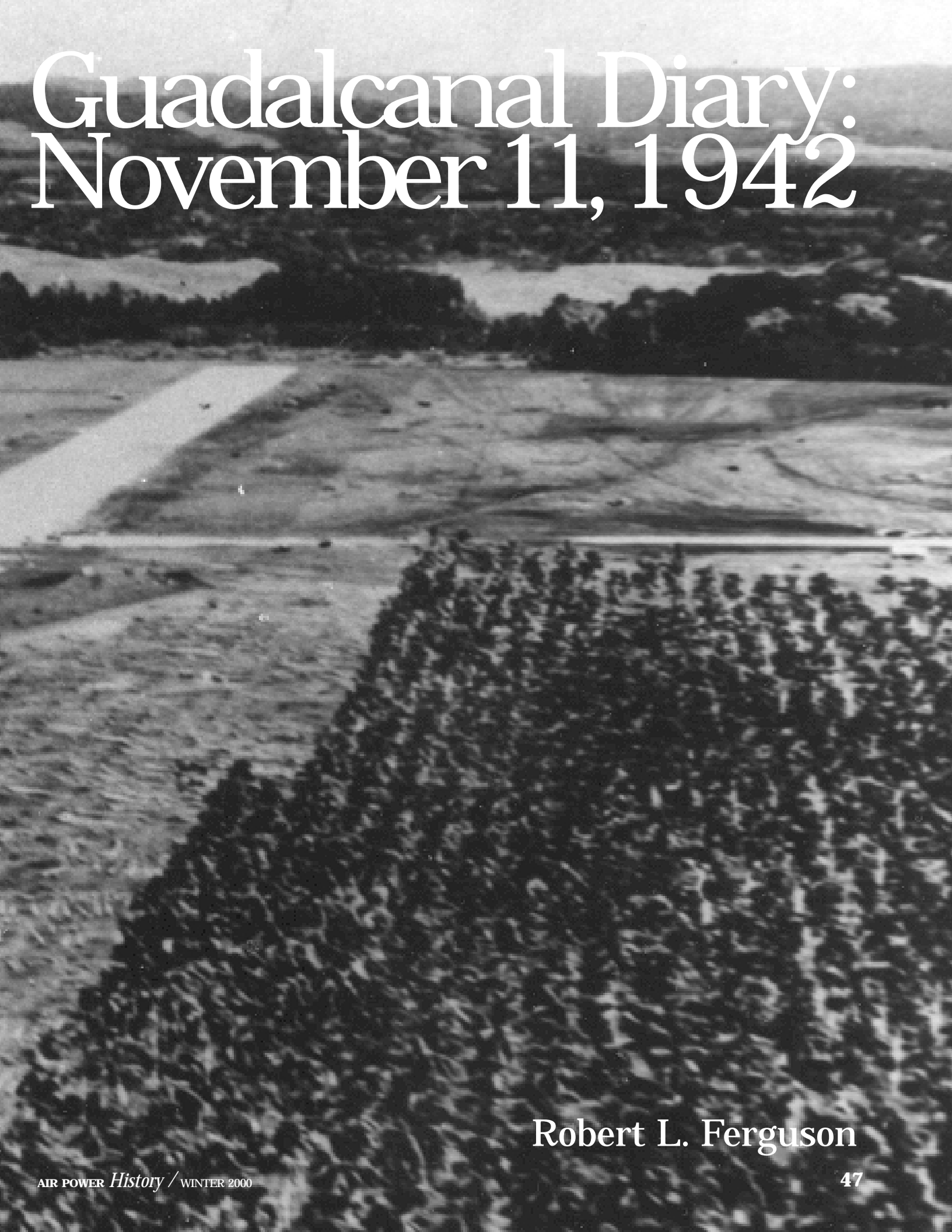
1. The factory was located in Latvia, while the *Avia Balt* was a branch set up in Petrograd to manufacture aircraft.
2. Because of Russia's limited manufacturing capability at this time, the Russians often put captured enemy aircraft into service.
3. The sesquiplane form, with its large top wing and small lower wing had been popularized by Nieuport in France and widely copied.

4. Earlier, in the Autumn of 1915 the Navy Department had sent S-16 No. 155 to *Avia Balt* to convert it into a Navy fighter, equipped with the Le Rhone 80-hp engine and Vickers machine gun. That S-16 was mounted on floats that had earlier been used on Sikorsky's S-5A and S-10. The conversion was done at *Avia Balt* in 1916. Later, a hydroplane was tested, but it did not live up to Sikorsky's expectations.

An aerial black and white photograph of Guadalcanal, showing a large body of water in the foreground, a road or path winding through the middle ground, and a dense forested area in the background.

The 67th Fighter Squadron "Fighting Cocks" at Guadalcanal

Ralph H. Saltsman, Jr



Guadalcanal Diary: November 11, 1942

Robert L. Ferguson

(Overleaf) The Japanese airfield at Lunga Plain, shortly before the invasion of Guadalcanal. Taken by a B-17 during a surveillance flight by the 11th Bombardment Group in July of 1942. Mount Austen, known as the "grassy knoll," can be seen in the background. (National Archives.)

"THAT P-400 MISSION OF YOURS AT BLOODY RIDGE, SAVED GUADALCANAL"

Henderson Field, on September 14, 1942, Generals Alexander A. Vandergrift, commander, First Marine Division, and Roy S. Geiger, commander, 1st Marine Air Wing, visited the 67th Fighter Squadron, the "Fighting Cocks." They talked to Captain John A. Thompson, 67th flight leader, about a mission flown that morning. "You'll never read it in the papers," General Vandergrift told Thompson, "but that P-400 mission of yours at Bloody Ridge, saved Guadalcanal."¹

Most accounts of the battle for Guadalcanal during World War II, and especially that of Bloody Ridge, have consisted of stories about the U.S. Marine Corps and Navy in ground and air operations. We have read of the Marine's 1st Raider Battalion, or "Edson's Raiders," and the fabulous exploits of the 1st Marine Air Wing's aces—John L. Smith, Joe Foss, and Marion Carl. However, little has been mentioned about such Army Air Forces' units as the 67th Fighter Squadron, that was part of the "Cactus Air Force." The Fighting Cocks of the 67th made a spectacular contribution that saved the Marine Raiders at Bloody Ridge, stopping the Japanese advance less than 1,000 yards from the airfield.

By the summer of 1942, the Japanese had expanded their area of conquest in the southwest Pacific to the Solomon Islands. The construction of an enemy airfield on Guadalcanal was in progress as plans for an American invasion of the Solomons was put in place. On August 7, the U.S. First Marine Division, commanded by Maj. Gen. Alexander A. Vandergrift, invaded Guadalcanal and adjacent islands. Two weeks later, the 67th Fighter Squadron with five P-39/P-400 aircraft, joined Marine and Navy squadrons at the new base, named for Major Lofton Henderson, a dive bomber leader killed at the Battle of Midway.

The P-39/P-400 was shipped to the United Kingdom as an export version of the P-39 Aircobra. However, the Royal Air Force declared the planes unfit for combat would not accept them under Lend Lease. Due to engine and oxygen restrictions, the P-400s were altitude-limited to below 14,000 feet, but they had excellent fire-power, self-sealing fuel tanks, and protective armor in the cockpit. The aircraft proved to be outstanding in close air support at the front lines. After it became operational in New Caledonia in March 1942, the 67th Squadron received a total of

forty-five P-400s, all in crates. The aircraft were assembled at a rate of one per day. Testing and training began immediately.

Robert L. Ferguson, a member of the 67th Fighter Squadron, kept a diary of his duty at Henderson Field during this period. He subsequently authored the book *Guadalcanal: The Island of Fire*, in which Ferguson described the mission of the 67th Squadron, at that time commanded by Capt. Dale D. Brannon.

The Japanese soon launched their first major drive to recapture the airfield and the bridgehead. In the central effort, a numerically superior force of Japanese troops, under the command of Gen. Kiyotaki Kawaguchi, attacked the perimeter defense lines south of Henderson Field. Expecting the brunt of the attack to come over a ridge of hills, just south of the Henderson runway, General Vandergrift deployed the Edson Raiders on the ridge. Throughout the night of September 13, while enemy ground troops assaulted Marine emplacements on the ridges, Japanese naval forces off shore bombarded Henderson Field and the nearby ridges.

Edson's Raiders held several retrograde positions, with some 300 Marines clinging to a knoll on the ridge—the last defensive position before Henderson Field—in a curved line. Edson moved the defensive mortar charge closer to the attacking Japanese, but the enemy still came on. The attacks and counterattacks continued with frequent grenade and hand-to-hand combat throughout the night and early hours of September 14th. Neither side achieved a distinct advantage. At about 0400 hours, division headquarters began to slip in some replacements to stiffen the line. It was a standoff, but with the Marine lines weakening.²

I have known John Thompson for more than forty-years. Although Thompson occasionally talked about his duty at Guadalcanal during World War II, he never mentioned the mission he flew at Bloody Ridge on September 14, 1942. It was not until I read Bob Ferguson's book, that I learned of the mission that earned John Thompson the Navy Cross, and each of his wingmen the Silver Star. Thompson related the story substantially as told below.³

U.S. Navy CBs [construction battalions] had come ashore with the Marines and finished

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Col. Ralph H. Saltsman, Jr., USAF (Ret.) was the commanding officer of the Army Air Forces' 331st Bombardment Squadron (94th Bomb Group) during World War II. On July 14, 1943, on his ninth mission, he was shot down over France, captured and interned in Stalag Luft III for twenty-two months. Following the war, he attended Command and General Staff College at Ft. Leavenworth, Kansas, and attended the University of Southern California's College of Aeronautics. He was a depot commander in the Philippines, served a combat tour in the Korean War as commander of the 18th Fighter-Bomber Group. After graduation from the Air War College, he was assigned to the Requirements Division at Headquarters USAF and served as Secretary of the Air Force Council. Following his retirement from the Air Force in 1960, he worked Martin-Marietta on the Titan ICBM program and for United Airlines in their training center. He wrote an article, Air Battle at Kiel, for Air Power History [Summer 1989]. Among his many decorations, Colonel Saltsman was awarded the Silver Star, DFC with two OLCs, and the Purple Heart.

The "Fighting Cock" insignia on the door of a P-39/P-400 of the 67th Fighter Squadron at Guadalcanal. (All photos courtesy of the author.)



Henderson Field, Guadalcanal

It is November 11, Armistice Day, a day to sum up in my mind what has been happening here in the war. We are beginning to feel like we may be able to hold on to this hot potato that we have taken from the Japanese. It wasn't very long after our arrival here at Guadalcanal that the Japanese responded by landing troops to the east and west of us, kept up their daily fighter and bomber attacks, and started the heaviest shelling by the Japanese Navy ships that one can imagine. The fury of bombs and shells bursting near us is

P-39/P-400 aircraft of the 67th Fighter Squadron arrive at Henderson Field, Guadalcanal, August, 1942.



sure to result in permanent acoustic trauma to our ears. We did not know from one day to the next if we could hold the airfield. There was even a plan to abandon the beachhead and airfield and fade into the jungle to fight in guerrilla tactics. They were always close, with snipers in the trees around the edge of the field. Marine Corps medics are always around. When there were wounded, they just showed up as if by magic. Wounds that did not take a man off duty were treated on the spot and off they went without even taking the man's name.

The Marines have so far held off their patrols, but one patrol got up on the airfield and burned an airplane. Tokyo Rose, between her periods of American music, was telling us how many Japanese troops were being landed every night to the east and west of us. She would tell us, "You are being abandoned like the men of Bataan and Corregidor." Heavy Japanese pressure was keeping the supplies and reinforcements we needed from approaching Guadalcanal. Her soothing remarks seemed to ring true. We knew what it was like to be losing. Were we expendable?

P-39/P-400

Our planes are so outclassed by the quality of the Japanese aircraft that only superior piloting and luck account for the good scores our planes are getting in the air. The Marines love the 67th Fighter Squadron because our P-39/P-400 Airacobra, with its heavy firepower, gets down in front of their lines to bomb and strafe the Japanese infantry and then climb up to meet the air attack. They go out of their way to be helpful to their lone Army unit in the landing force. This meager force of Marines has already saved the airfield three times, in the terrible battles of the Tenaru and Matanikau rivers and in the battle of "Bloody Ridge," just 1,000 yards south of the airfield, where Colonel Edson's Raiders paid dearly for their success.

After air combat our P-39/P-400 *klunkers*, if they return, are full of bullet holes from dodging Zeros while trying to get in a kill and everyone gripes about the poor capabilities of this airplane. We wonder how the United States can provide such inadequate equipment. We can't even fill its oxygen system because it's incompatible with the available low pressure oxygen supply. It takes over 30 minutes to climb to 16,000 feet altitude, if it gets that high.

Captain John Thompson came back from one scrape with 15 bullet holes in his plane and one in

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Lt. Col. Robert L. Ferguson, USAF (Ret.) served as a command pilot with the U.S. Army Air Forces' 67th Fighter Squadron during World War II. He then served as a flying instructor in two-engine advanced at Stockton Army Airfield, California. Later he was director of plans for the East Africa, Middle East Area (EAME) in the Air Force Communications Command. Lt. Col. Ferguson earned degrees in Electrical Engineering and Law from the University of Maryland. Following his retirement from the Air Force in 1962, he took a senior engineering position with IBM until ending his second career in 1978. He is the author of the award-winning book, Guadalcanal: The Island of Fire (1980).



(Above) Capt. John A. Thompson in a P-39/P-400 Airacobra, prepares to take off on an intercept sortie, September, 1942.

(Below) P-39/P-400 aircraft of the 67th Fighter Squadron arrive at Henderson Field, Guadalcanal, August 1942. (Photos courtesy of Robert L. Ferguson.)

enough of the airstrip for our Marine air units to start operations. Maj. John L. Smith led in his fighter squadron and a scout bombing squadron. They went into action immediately against the Japanese air and naval units attacking our positions. A few days after the Marines arrived on Henderson Field, the first Army Air Forces P-39/P-400s arrived. They had flown from New Caledonia to Efate and then to Espiritu Santo, in the New Hebrides. The final leg from there to Guadalcanal was maximum range for our fighters, and since they did not have adequate navigational



instruments, they followed a B-17 like chicks after a mother hen.

By this time the Japanese were making regular runs down the "slot" from Raboul to bomb the airstrip, accompanied by an escort of Zeros. A couple of days after the first P-400s got to Henderson Field, Thompson arrived with nine planes, using the same procedures as the first flight. He went into action immediately, and soon learned that the P-400 was no match for the lighter, more maneuverable Zero. The P-400's engine had no supercharger, resulting in lack of power to perform effectively at combat altitude. Also, being an export model, the P-400 was equipped with the high pressure oxygen system instead of our standard low pressure system. Flying without oxygen limited the aircraft's use to between 10,000 and 12,000 feet and effectively excluded us from aerial combat.

The aircraft, however, had good firepower, and proved successful at ground support. The 67th became very effective in coordinated action with our ground troops when strafing and bombing in their problem areas. Our pilots also attacked concentrations of Japanese troops and equipment in other parts of the island. The Japanese intensified their efforts to regain the airfield. They had virtual control of the sea, which made our supply situation critical.

The aerial bombing by day, the shelling from Japanese naval vessels off shore, and the artillery fire from the jungle at night, had become pretty standard conditions for the troops on Guadalcanal. Also the Japanese ground troops were gearing up for a big push to recapture Henderson Field. Beginning about September 12th, they had focused on an area about 1,700 yards south of the runway, where there were several ridges of higher ground that dropped off to a fairly clear area with the Lunga River and the jungle in the background. The Japanese had used the jungle as a cover to assemble for the attack. Our Marines had dug in on the higher ground and on the ridges overlooking the clearing. The fighting had been fierce all day and throughout the night, forcing our Marines to retreat to the ridge in order to keep their lines intact.

The situation had become extremely serious. The Japanese had our supplies almost completely cut off, and they were mounting an offensive that strained our Marines almost to the breaking point. The 67th Fighter Squadron had been badly decimated, with only a few aircraft in commission and enough gasoline for only three aircraft. Just before daylight on the morning of September 14th, Thompson received a message from the Pagoda, the command post for all Marine and aircraft operations on Guadalcanal. Upon arrival Thompson was directed to a group of Marines who were in deep conversation with a first lieutenant. As he approached, they all turned towards him and one Marine said, "We're hoping you can help us here."

They explained that the Japanese were amassing troops just over the hill from our defending

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(Top) Ground crew members of the 67th Fighter Squadron standing by a P-39/P-400 of the "Cactus Flight."

(Middle) The Lunga River sits in the background as this Japanese bomber downed by fighters burns near Henderson Field, September 12, 1942.

(Bottom) Number 22, a workhorse P-39/P-400 Airacobra, stands ready for another "Jagstaffel" sortie, October 1942.

his shoulder, after flying around at 14,000 feet without oxygen, in a plane that loses combat capability with every foot of altitude. But the plane is superb as an attack aircraft in close air support. The Marine F4F Wildcat is a little better up high but it is still outclassed by the Japanese Zero fighter.

Snipers

By mid-October our shoes and clothing were about worn out. We are a "raggedy-assed" looking group and still living on short rations. The infantry men

out on the front line perimeter look even worse. We have to spend too much time fighting off Japanese snipers. They infiltrate to the edge of the airfield, get up in the trees, and try to pick us off as we move about the airplanes.

Japanese control of the waters around Guadalcanal has our Navy operating with great caution. Sometimes we wonder if there is a U.S. Navy. To top it off, Japanese artillery guns in the nearby hills can now reach the airfield and they lob in a few shells every now and then. We call the gunner "Pistol Pete," and a lot of other names I can't repeat. On the night of October 13, we had the worst naval shelling of all time by Japanese battleships. It wrecked planes, burned gasoline, and killed a lot of people on the airfield. It's like living on the target.

The sound of shells, bombs, and other battle noises makes a constant deafening din. During the battle of Bloody Ridge, with our aviation gas almost gone, Captain Thompson led a flight out in the first light of early morning to attack and strafe the Japanese troops pressing their assault on the Marine lines along Bloody Ridge. The planes were so shot up from diving low over the Japanese troops and taking a lot of their ground fire that two of them had to land with dead engines. We could see the whole show from our flight line area on the airfield. The surprise attack annihilated the Japanese troops and they withdrew into the jungle to the south providing another reprieve for the beleaguered airfield.

For a while we had to be supplied with aviation gas by C-47 transports flying in twelve or sixteen 55-gallon drums of gas per load. Each C-47 then flew out sixteen of the most severely wounded men on litters. They kept us going with fuel until a ship got through and a submarine with its tanks filled with aviation gas.

164th Infantry

The Japanese again attacked on three sides, between October 23 and the morning of the 25th, when they made a big push to recapture the airfield. There were continuous air attacks, those not in the air could hardly leave the bomb shelter. What a way to spend Sunday. Our front lines held, although they were stretched thin and the Army's 164th Infantry Regiment, just newly arrived, was experiencing its first real taste under fire. Japanese ground and air losses were heavy. They want this place back pretty bad and I am glad we are getting a few more planes in.

There have been only rare opportunities to attend religious service but we do have a Marine Corps chaplain, Lt. Fred Gehring, our *padre*. He is very good to the troops. I attended one of his services right here off the edge of the airfield. They say he would hold his services in hell if he could get his jeep in there. Well, he just about made it here on Guadalcanal.

Today, November 11, has been like all the rest.

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P-39/P-400 Number 22, a combat workhorse, ready for another mission, October 1942, Henderson Field, Guadalcanal. (Photo courtesy of Robert L. Ferguson.)



THE PLAN
WAS FOR
OUR
AIRCRAFT TO
STRAFE THE
JAPANESE
BEFORE
THEY COULD
LAUNCH
THEIR
ATTACK

THE ENEMY
BROKE AND
RETRACTED
INTO THE
JUNGLE,
LEAVING THE
MARINES IN
CONTROL

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Marines, and that they were beginning to infiltrate our lines. Our Marines had been holding out all night but it did not look as if they could continue much longer. They expected the Japanese to launch their big push soon after daylight. Thompson was introduced to a Marine lieutenant who was sitting in the center of the group. He was the company commander of the troops who were at the point of the hill where the Japanese were expected to attack. He was holding a helmet with a bullet hole through it; there was blood on his head and the side of his face. The bullet had grazed him. He took out a small piece of paper and drew a crude map of the area showing the Marine positions on the ridge, and the area below the ridge, where the Japanese were amassing in preparation for their attack. If this push succeeded, they would be on Henderson Field and behind our lines, in position to take over the airfield.

The plan was for our aircraft to strafe the Japanese before they could launch their attack. It was starting to get light and time became critical. The aircraft we had available were always on alert—ready to go—with pilots assigned. When Thompson returned to the 67th area, he explained the situation, and with Lts. B. E. Davis and B. W. Brown as his wingmen, they taxied out and took off. Thompson stayed low and circled wide around the field. Each aircraft had two 30 caliber guns in each wing, two 50 caliber guns, and a 20-mm cannon in the nose. Thompson led the flight and they spread out in single file, leaving enough separation between aircraft to permit separate approaches. As he came in, just over the trees, Thompson saw the location of the Marines on the ridge. In a clearing below the ridge were hundreds of enemy troops, crowded together. They were caught completely by surprise as he depressed the nose of the aircraft to line up the guns. He actuated the gun switch and the six machine guns poured firepower into the crowded troops. He then pulled up and the

next aircraft made a firing pass. However, by this time the enemy realized what was happening and they began firing back at the aircraft. As a result, the second aircraft was hit in its coolant radiator and forced to pull up and make a dead stick landing at Henderson Field. The third aircraft made its pass and fortunately was not hit. Thompson continued around, making another pass. Because of the location of our Marines on the ridge as well as the trees that bordered the clearing, the trio were unable to vary their approaches so as to exploit the element of surprise in the attack. Consequently, on Thompson's second pass the enemy was waiting, and as he dove in with guns blazing, he could see their rifles pointed at him. Although he completed the pass, Thompson's plane was also hit in the coolant radiator and he was forced to land at Henderson. Behind him, Lt. B. E. Davis also made his second run. He was hit, but apparently not critically, as he circled and made a third pass. Although his aircraft was trailing smoke, he made it back for a safe landing.

The mission caused so much damage and confusion that the enemy broke and retreated into the jungle, leaving the Marines in control of "Bloody Ridge." Subsequent reconnaissance of the area revealed that the enemy casualties from Marine troops and aircraft, as well as the 67th squadron's aircraft totaled approximately 600.

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Sources

1. Robert L. Ferguson, *Guadalcanal: The Island of Fire*. New York: TAB Books, 1987, p. 106.
2. Richard B. Frank, *Guadalcanal*. New York: Random Books, 1990, p. 239.
3. John A. Thompson, "Recollections of the 67th Fighter Squadron on Guadalcanal," unpublished manuscript, February 2000.

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Early today the Japanese dive bombers, protected by Zeros, attacked three ships unloading our supplies. Six F4F Wildcats were lost trying to protect the ships, but they shot down at least four Zeros

and a dive bomber. Fortunately, we did not lose any of our P-39s today. The Navy transport USS *Zelin* was hit. At noon, Japanese high-altitude, two-engine bombers were overhead again for the daily "Tojo Time" raid and air combat show.

(Right) Air and ground crew members stand behind P-39/P-400 door bearing the "Fighting Cock" squadron emblem.

(Below) P-39/P-400 Number 12, burned up on the airfield at Guadalcanal.

(Bottom) P-39/P-400s of the 67th Fighter Squadron at Henderson Field, Guadalcanal in August of 1942.



Leaving

We are about due for another big Japanese effort to recapture this place. By that time the P-38 Lightnings we keep hearing about may arrive.* But I will not be here to see them come in. We have had some replacements arrive, some came in on a submarine. When the dawn patrol goes up in the morning, I will be leaving on a C-47 transport to Espiritu Santo, in the New Hebrides, and then on to New Caledonia. Back to the squadron at Tontuta, tired, a couple of fragment wounds, and forty pounds lighter than when I arrived here. I am sure I will be back here again after I get new clothes and some rest. But for now, am happy with the relief. So you see that the great armistice in the year of my birth did not end "the war to end all wars" and in this generation the armistice or truce that eventually comes will be no different.

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* The P-38s mentioned arrived on November 12th. Six of them under the command of Maj. Dale D. Brannon, commanding the 339th Fighter Squadron.

Editors note: Early in 2001, Colonel Ferguson's book, *Guadalcanal: The Island of Fire*, will appear in its second and expanded edition. For information, call Creative Arts Books, (800) 848-7789.

Slanguage

Brian S. Gunderson

Part I: Letters A-C

In 1942, U.S. Army Air Forces B-17 Flying Fortress aircraft crossed the Atlantic Ocean to become the nucleus of the Eighth Air Force, based in England. There they joined Royal Air Force Bomber Command Squadrons in turning Adolf Hitler's dreams into nightmares. After their arrival, the American aircrew and support personnel quickly became aware of two unique aspects about their new, albeit temporary, home. To begin with, the size of the British Isles was surprisingly deceiving. Area-wise England is smaller than North Carolina and the whole of Great Britain is barely larger than Minnesota. Furthermore, no point in Great Britain is more than 100 miles from the sea. What really made those young Americans aware of the small size of England was the fact that after all the Royal Air Force and Eighth Air Force airfields had been constructed and had become operational, mostly in southern, middle, and northeastern England, it was difficult for one airfield's air traffic pattern to not overlap with a neighboring one. This factor, sad to say, became a major problem when aircraft were flying at night in bad weather with low ceilings during training flights, or returning from combat mission over mainland Europe. It was not unusual to have more aircraft lost due to mid-air collisions or from crashes into the ground in poor weather than those aircraft that were lost to enemy action on a major combat raid on any given day or night.

The second unique aspect of life in England that U.S. air and ground crew personnel faced was, of all things, the English language as used and spoken, especially by the British military personnel. To begin with, dozens of different accents were used throughout Great Britain. Not only did the Americans have to adjust to English, Scotch, and Welsh accents, but each county (like a

U.S. state but much smaller)—and there were dozens of them—added a unique dialect and phraseology, with quirky pronunciations that had existed and persisted for centuries. Oscar Wilde, after a trip to the United States said, "We really have everything in common with Americans nowadays except, of course, language." This fact was visibly brought home to American troops in England during the war by a sign in a chemist's shop (a drugstore) window which read: "Both American and British spoken here!" Even Bob Hope got into the act when during one of his appearances before U.S. military personnel he stated: "If it weren't for the language, you couldn't tell us apart from the British." Prime Minister Winston Churchill summed it up, when referring to Americans and Englishmen, by saying, "We are a common people separated by a common language."

Compounding the difficulty that Americans had with the variances in pronunciation and phraseology used by the British was the fact that hundreds of words found in a British dictionary differed from the way they were spelled in a U.S. dictionary. Some involved nothing more than the inclusion of an extra letter, whereas in others more than one letter per word was added. Pages could be filled with such words; listed below are just a few of the more common examples.

English	American
Alarums	Alarms
Aluminium	Aluminum
Armourer	Armorer
Bale Out	Bail Out
Defence	Defense
Despatched	Dispatched
Draughty	Drafty
Enquire	Inquire
Favour	Favor
Hangar	Hanger
Kerb	Curb
Organise	Organize
Programme	Program
Propellor	Propeller
Sceptic	Skeptic
Taxyed	Taxied
Tyre	Tire
Vapour	Vapor

Added to the differences in the spelling and the pronunciation of words on both sides of the Atlantic Ocean was the evolution of a mosaic of

Brig. Gen. Brian S. Gunderson, USAF (Ret.) served as President of the Air Force Historical Foundation from 1983 to 1987. While on active duty, between 1972 and 1974, he was Chief of the Office of Air Force History. He is the only Air Force officer to have held both of these assignments. Currently, he is the Executive Assistant to the Publisher of Air Power History. His career in military aviation included two years with the Royal Canadian Air Force. Gen. Gunderson flew fifty-one combat missions as a crew and squadron navigator in B-17s in the Eighth Air Force in England during World War II. He also served as executive assistant to three successive Secretaries of the Air Force—Eugene M. Zuckert, Harold Brown, and Robert C. Seamans, Jr.—from 1963 to 1969, at which time he became Chief of Staff, United States Air Forces in Europe.

jargon, slang, and nicknames during World War II, especially among the British armed services personnel. None was more unique than that found on Royal Air Force airfields in Great Britain. With personnel that came from every county of the British Isles and from the British dominions worldwide, it didn't take long for a group of diverse slang words and colloquialisms to evolve, which were used by aircrew and ground support personnel alike. The degree to which this occurred is most evident when one reads the many postwar military biographies, autobiographies, and military histories that were written about Royal Air Force activities during World War II. More than ever before, large portions of those volumes contained lengthy, first person accounts by individuals who used this "slanguage" in describing their lives and their activities during wartime. It was a far cry from what has been called "The King's or Queen's English" which is spoken and heard at Oxford and Cambridge Universities, Eton and Harrow Public Schools, or used by British aristocrats and gentry, as well as by the British Broadcasting Corporation's (BBC) news announcers with their mellifluous tones and rounded vowels.

During World War II and since, this author has developed a list of such "slang" words, phrases and nicknames that he has either heard in conversations or read in books over the past fifty plus years. To date, the list contains 700 such words, phrases and colloquialisms. There are probably other such words that merit inclusion in such a list, but for some reason I have not heard them or read them, or else I have forgotten them. Furthermore, the list does not include the many Australian and New Zealand slang words peculiar to that part of the world. Usually, because of their unique character they were only heard in conversations between Australian and New Zealand airmen when stationed on the Royal Air Force airfields.

Fifty-five years have passed since World War II ended and if one accepts the dictionary definition that approximately thirty years makes up a generation, we are nearly two generations past the dates most of these World War II stories were told and put into written form. For anyone interested in reading the history of Royal Air Force's operational and off-duty activities during World War II, and for those readers of future generations, it is my hope that this reference document, explaining these unique linguistic eccentricities, will prove to be both interesting and useful.

The sources for the words and phrases included in the attached list are varied. Many were created on the Royal Air Force airfields to create a brief word or expression to describe military equipment, personnel, and operations. Such "slanguage" originally came into being years ago, mostly during periods when military personnel were involved in large combat activities. The Civil War in the United States in the 1860s saw such practices used to a greater degree than ever

before. During World War I, especially among the British military forces, the use of slang words and unique expressions became common practice. Some words, unique to the World War I years, continued to be used by British military forces personnel during the 1920s and 1930s and throughout the World War II years. One interesting word that falls into the category is "FAG," used instead of the word cigarette. During World War I, British soldiers were supplied with "non-brand" cigarettes. Written on the boxes were the words "FOR GOOD SMOKES," a descriptive term that the troops in the trenches quickly compressed to "FAGS," which is used to this day by many personnel in the British military forces. Another interesting word is "POSH," which means upper class, ritzy, elegant, etc. The evolution of the word dates back to the early part of the 20th century when British Army officers, sometimes with families, traveled by boat to India when they were being sent there for a long assignment. With no air conditioning on board the ocean liners in those days, senior officers were favored in cabin assignments by applying the following guideline: "Port Out, Starboard Home" (abbreviated to "POSH"). Since the ship's route on the way to India through the Mediterranean Sea and the Indian Ocean called for mainly an easterly course by the ship, that meant the port side was the shady side outbound and the reverse was true for the trip homeward to England (i.e. the starboard side).

Some slang words that evolved during World War II were so frequently used that the addition of a slang adjective became a common practice. For instance, the word Gen, which means information generally speaking, was often modified as follows:

- Ace Gen – Topgrade information
- Duff Gen – Bad or unreliable information
- Bags of Gen – Lots of information
- Pukka Gen – Good, accurate information

In other instances, the use of several slang words were used to describe a single subject. For example a girl was, more often than not, referred to as a Birt, a Bird, a Bit of Fluff, a Crumpet, a Poppet, or a Pospypoppsie. A group of girls at a dance was usually referred to as "Bags of Stuff."

Many of these unique and peculiar slang words and phrases, because of their direct relationship to the Royal Air Force activities, aircraft and combat operations during the war years, also were unknown to the general English population. They, too, like American military personnel in England, had to learn its meaning from relatives or friends at home on leave from their military assignments with the Royal Air Force. For all those people who missed out on learning the meaning of these slang words, it is hoped that this list can provide assistance and, at the same time, make for interesting and entertaining reading.

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ROYAL AIR FORCE TERM	U.S. ARMY AIR FORCES EQUIVALENT/ DEFINITION	ROYAL AIR FORCE TERM	U.S. ARMY AIR FORCES EQUIVALENT/ DEFINITION
ABOUT TURN	ABOUT FACE	BALBO, A	A LARGE FORMATION OF AIRCRAFT
ACCUMULATOR	AN AIRCRAFT GENERA- TOR	BALLOONATICS	PERSONNEL ASSIGNED TO ANTI AIRCRAFT BAR- RAGE BALLOON UNITS
ACEY-DEUCY	AIRMAN SECOND CLASS, LOWEST RANKING AIR- MAN IN RAF, AC2	BALLOON WENT UP	A MAJOR PROBLEM OCCURRED
ACE GEN	TOPGRADE INFORMA- TION	BANDITS	ENEMY FIGHTER AIR- CRAFT
ACK ACK	ANTI-AIRCRAFT FIRE	BANGERS AND MASH	ENGLISH SAUSAGES AND MASHED POTATOES
ACKERS	BRITISH POUNDS STER- LING, CURRENCY	BANG-ON	RIGHT ON COURSE, ON TARGET, ON TIME, BULLSEYE
AERODROME	AN AIRBASE, AIRFIELD	BARA	SECOND DECORATION OF THE SAME CLASS
AIRSCREW	AN AIRCRAFT PRO- PELLER	BARMY	DAFT, SILLY, IDIOTIC
ALL ARMS AND LEGS	WEAK BEER	BAR TO A GONG	A CLUSTER TO A MEDAL OR SERVICE RIBBON
ANGELS	AIRCRAFT ALTITUDE (E.G. ANGELS 3 - 5 = 3,000 - 5,000 FEET)	BASE WALLAH	HQ STAFF PERSONNEL
ANTI-DIVER PATROLS	V-1 BOMB INTERCEPTOR FLIGHTS	BASH	AN AERIAL ATTACK AGAINST AN ENEMY RAILROAD JUNCTION
APRON	THE TARMAC AROUND A HANGAR	BASHER	ANY TYPE OF AIRCRAFT MECHANIC
ASTRO	NAVIGATION BY REFER- ENCE TO STARS, MOON AND SUN	BASINFUL, HAD A	EXPERIENCED MORE THAN ENOUGH HARD- SHIP
AUK	AN AC2 (AIRMAN SEC- OND CLASS IN RAF)	BATMEN	RAF ENLISTED PERSON- NEL ASSIGNED TO OFFI- CERS TO PERFORM VALET DUTIES FOR WHICH OFFICERS PAID A MONTHLY FEE
AUSSIES	AUSTRALIAN SERVICE PERSONNEL	BATTLE BOWLERS	METAL HELMETS WORN DURING ENEMY AIR RAIDS
BACKROOM BOYS	MILITARY SCIENTISTS THAT WORKED IN SECRET TO DEVELOP NEW WEAPONS, COUNTER MEASURES, ETC.	BAY	AN AIRCRAFT PARKING HARDSTAND
BAD PATCH	ROUGH TIME	BEACON STOOGES	PRACTICE AIRBORNE RADIO BEACON AERIAL NAVIGATION MISSIONS
BAD SHOW	NOT GOOD, JUST NOT DONE	BEAK, THE	WHAT RAF STUDENTS CALLED AN INSTRUCTOR (TAKEN FROM TITLE USED FOR A MALE TEACHER AT SCHOOLS SUCH AS ETON AND HARROW)
BAGGED	SHOT DOWN AN ENEMY AIRCRAFT		
BAGS OF GEN	LOTS OF INFORMATION		
BAGS OF MODS	LOTS OF AIRCRAFT MOD- IFICATIONS		
BAGS OF STUFF	LOTS OF GIRLS		
BAGS OF SWANK	LOTS OF PRIDE		

**ROYAL AIR
FORCE TERM****U.S. ARMY AIR FORCES
EQUIVALENT/
DEFINITION**BEAT-UP
THE AERODROMEUNAUTHORIZED
BUZZING OF HOME AIR-
FIELD AFTER A suc-
cessful mission or
last mission of oper-
ational tour

BEAU

BRISTOL BEAUFIGHTER
AIRCRAFT USED BY RAF

BEEB

BRITISH BROADCASTING
COMPANY (BBC)

BEEHIVE

BOMBER AIRCRAFT
ESCORTED BY FIGHTERS

BEETLE CRUSHERS

HEAVY BOOTS

BEETLE HOME

RETURN TO BASE OR
AIRFIELD

BELISHA BEACON

A PEDESTRIAN TRAFFIC
CROSSING SIGNAL

The author, Brian
Gunderson, broadcasting
from the American Red
Cross Rainbow Corner in
London, England, in the
BBC program "The
American Eagle in Britain."
(All photos courtesy of the
author.)

**ROYAL AIR
FORCE TERM****U.S. ARMY AIR FORCES
EQUIVALENT/
DEFINITION**

BIG BEN

GERMAN V-2 ROCKET
MISSILE/BOMB

BIG CITY

BERLIN

BIG NOISE

A VIP, AN IMPORTANT
CELEBRITY

BIND

A MONOTONOUS OR DIS-
TASTEFUL TASK

BINDER

ONE WHO COMPLAINS
OR NAGS, A WHINER, A
GRIPER

BINDERS

BRAKES ON AN AIR-
CRAFT

BINT

A GIRL

BIRD

A GIRL

BISCUIT

A COOKIE

BIT OF FLUFF

A GIRL

BLACKMAIL

SABOTAGE ACTION
AGAINST GERMANS BY
FRENCH WORKER

BLANKET DRILL

TO SLEEP, TAKE A NAP

BLIGHTER

AN ANNOYING OR NASTY
PERSON

BLIGHTY

A NICKNAME FOR ENG-
LAND

BLOKE

A PERSON, A GUY, AN
ENGLISHMANBLOODY RUM
SHOW

REALLY BAD SITUATION

BLOOD TUB/
BLOOD WAGON

A MILITARY AMBULANCE

BLOTTO

A PERSON WHO IS
DRUNK

BLOWER

AN AIRCRAFT SUPER-
CHARGER

BLUEBOTTLE

A POLICEMAN

BOB

A BRITISH COIN, A
SHILLING (APPROX 25
CENTS)

BOBBY

A POLICEMAN

BODS

A GROUP OF AIRMEN

**ROYAL AIR
FORCE TERM****U.S. ARMY AIR FORCES
EQUIVALENT/
DEFINITION**

BOFFIN

A SCIENTIST, AN ENGINEER WORKING FOR BRITISH MILITARY

BOGEY

AN UNIDENTIFIED AIRCRAFT

BOG RAT

A BASIC RAF RECRUIT

BOILER SUIT

A ONE-PIECE OVERALL SUIT, COVERALLS

BOLSTER

A PILLOW

BOMB AIMER

THE BOMBARDIER ON AN AIRCREW

BOMBPOON

WITH BOMBS ATTACHED

BOMB RAILS

BOMB RACKS

BOMBPHLETEERS,
BUMPHLETEERS

AIRMEN WHO DROPPED PROPAGANDA LEAFLETS OUT OF AIRCRAFT OVER ENEMY OR ENEMY HELD TERRITORY

BONKERS

SILLY, CRAZY

BONNET

HOOD ON A CAR OR TRUCK

BOOB

AN ERROR, A MISTAKE

BOOK OUT

SIGN OUT ON PASS OR LEAVE

BOOMERANG

AN EARLY AIRCRAFT ABORT BEFORE BOMBING THE TARGET

BOOT

THE TRUNK OF A CAR

The author is the middle figure standing in the back row.

**ROYAL AIR
FORCE TERM****U.S. ARMY AIR FORCES
EQUIVALENT/
DEFINITION**

BOOZER

A RADAR WARNING DEVICE FITTED IN RAF AND A FEW USAAF BOMBERS WHICH PROVIDED WARNING AGAINST ENEMY RADAR, SEARCH LIGHTS AND NIGHTFIGHTER AIRCRAFT

BOUGHT THE FARM,
BOUGHT IT

KILLED OR MISSING IN ACTION OR IN AN AIRCRAFT ACCIDENT

BOUNCE

A SURPRISE ATTACK BY A FIGHTER AIRCRAFT FROM ABOVE

BOWSER

A PETROL, A GASOLINE OR AN OIL REFUELING TRUCK

BRACES

A PAIR OF SUSPENDERS

BRASSED OFF

ANTI-AUTHORITY, DISGUSTED, FED-UP

BREKKERS

BREAKFAST

BREVET

AIRCREW WINGS WORN ON UNIFORM

BROLLY

AN UMBRELLA, ALSO A PARACHUTE

BROLLY HOP

A PARACHUTE JUMP

BROWNE OFF

UNHAPPY, FED-UP

BRYLCREEM BOYS

NAME GIVEN TO RAF PERSONNEL THAT USED HAIRCREAM OF THAT NAME TO GIVE THEM SLICKED HAIR LIKE HOLLYWOOD ACTORS. BRYLCREEM ADS SAID, "MEN OF ACTION NEED BRYLCREEM."

BUBBLE AND
SQUEAK

MIXTURE OF MASHED POTATOES, BOILED CABBAGE AND LEFTOVER HAM, BEEF OR TURKEY, ALL FRIED TOGETHER

BUCKSHEE

FREE

BUFF

INFORMATION

BULLING

POLISHING UNIFORM BRASS, SHOES OR FLOORS

BULL'S EYE
MISSIONS

BOMBING AND GUNNERY TRAINING MISSIONS

ROYAL AIR FORCE TERM	U.S. ARMY AIR FORCES EQUIVALENT/ DEFINITION	ROYAL AIR FORCE TERM	U.S. ARMY AIR FORCES EQUIVALENT/ DEFINITION
BUMPH, BUMFF	PILES OF USELESS PAPERWORK OR INFOR- MATION	CHEESED OFF	BORED, FED-UP, HOPE- LESS
BUMWAD	PROPAGANDA LEAFLETS DROPPED BY RAF CREWS OVER FRANCE AND GER- MANY	CHEMIST	A PHARMICIST
BURN UP	DO A LOW-LEVEL BUZZ JOB IN AN AIRCRAFT	CHESTERFIELD	A SOFA
BUS DRIVER	A BOMBER PILOT	CHIEF/CHIEFEE/ CHIEFY	A FLIGHT SERGEANT IN THE ROYAL AIR FORCE
BUSTER	FULL THROTTLE, FLAT OUT, THROUGH THE GATE	CHINESE WEDDING CAKE	A RICE PUDDING
BUTTONED UP	AN AIRCRAFT MAINTENANCE JOB WELL DONE	CHIPS	FRENCH FRIED POTATOES
BUZZ BOMB	A GERMAN V-1 FLYING BOMB	CHOPPED OUT	WORN OUT
CALL OVER	A ROLL CALL	CHOP RATE	CASUALTY RATE, PER- CENTAGE OF OPERATIONAL AIRCRAFT AND AIRCREW LOSSES
CANOPY	AN AIRCRAFT COCKPIT	CINEMA	A MOVIE THEATER
CANTEEN COWBOY	A LADY'S MAN	CIPHER SIGNALS	CLASSIFIED MESSAGE TRAFFIC
CARDIES	CARDIGANS, SWEATERS	CIRCUITS AND BUMPS	TOUCH AND GO LAND- INGS BY AIRCRAFT
CARPETED	AN RAF AIRMAN WHO RECEIVED JUDICIAL OR ADMINISTRATIVE PUN- ISHMENT	CIRCUS	A FIGHTER-ESCORTED, SHORT RANGE RAF BOMBER ATTACK
CARRY THE CAN	ACT AS A SCAPEGOAT	CLAG	HEAVY, DENSE CLOUD COVER
CASHIERED	DISHONORABLY DIS- CHARGED FROM MILI- TARY SERVICE	CLANGER	A BLUNDER, A MISTAKE
CAT "A" ACCIDENT	AN AIRCRAFT NON- REPAIRABLE	CLAPPED OUT	WORN OUT (AS AN AIR- CRAFT)
CAT "B" ACCIDENT	AN AIRCRAFT REPAIRABLE AT FAC- TORY OR AT AN RAF REPAIR DEPOT	CLEVER DICK	A SMART ALEC
CAT "C" ACCIDENT	AN AIRCRAFT REPAIRABLE ON STA- TION/AIRFIELD	CLOBBER	FLYING GEAR WORN BY AIRCREW-LONG UNDER- WEAR, ROLL-NECK SWEATER, BATTLE DRESS UNIFORM, FLIGHT COVERALLS, BOOTS, MAE WEST AND PARACHUTE
CATCH A PACKET	AN AIRCRAFT OR AN AIR- CREW MEMBER HIT BY ENEMY AIRCRAFT FIRE	CLOCK	AN AIRSPEED INDICA- TOR
CATERPILLAR CLUB	AIRCREW MEMBERS WHO SURVIVED AN EMERGENCY PARA- CHUTE JUMP	CLOCK BASHER	AN INSTRUMENT REPAIR TECHNICIAN
CHATTING UP	TALKING, CARRYING ON A CONVERSATION	CLOT	AN IDIOT, A DUMMY
		CLOTTED	BUNCHED UP, E.G. AIR- CRAFT LINED UP AWAIT- ING TAKEOFF

Book Reviews

The JG 26 War Diary: Volume Two 1943-1945. By Donald Caldwell. London: Grub Street, 1998. Photographs. Pp. 576. \$49.95 ISBN: 1-898697-86-8

A follow up of his *JG 26: Top guns of the Luftwaffe* (1991), Donald Caldwell has added another superb work on the *Luftwaffe* to the corpus of serious works on air power history. In this volume, the author outlines the combat actions, victories, and losses of Germany's premier fighter wing on the Western Front. By following this micro view of history, Caldwell documents the decline and fall of the *Luftwaffe* against the Allied air forces during the height of the Allied bombing campaign against Germany.

The strength of the book lies in Caldwell's comprehensive approach to research. The *Luftwaffe* documents in the German Military Archives were thoroughly examined by the author as well as the letters, log books, personal diaries of *Jagdgeschwader 26* personnel. In addition, the author interviewed dozens of surviving members of JG 26. While getting a comprehensive picture of the air war from the German side, Caldwell also conducted exhaustive research in the American and British archives for hundreds of specific instances of air combat in order to verify victory and loss claims and to carefully reconstruct the events of many of the aerial battles.

The author's technique is to link the actions of JG 26 with the operational level air war. The primary Royal Air Force and U.S. Army Air Forces bombing targets and air operations are briefly outlined on a daily basis to provide a context for JG 26's operations, which were primarily to defend Northern France, the Low Countries, and Northern Germany against Allied bombing raids. From there, the author provides an outline of JG 26's operations for each day of the war from 1943 to the surrender in 1945. Losses and victory claims are covered in great detail as well as some selected instances of fighter combat. In *The JG 26 War Diary*, the reader can clearly see the slow decline of the *Luftwaffe* fighter force and the loss of German air superiority over Northern Europe. Although the *Luftwaffe* held on capably throughout the air battles of 1943, by early 1944 one sees the effect of attrition upon an elite fighter unit as the unit's experienced pilots were lost and replaced with men with minimal flight training who proved to be easy targets for the well-trained British and American pilots who were now escorting the bombers in overwhelming numbers. Yet, despite heavy attrition and numerous disasters—such as the heavy losses from the ill-conceived *Operation Bodenplatte* on January 1, 1945—JG 26 remained a cohesive and capable combat unit right to the end of the war. Indeed, the last aerial victory of JG 26 came on 1 May 1945.

One especially valuable contribution of the book is its analysis of numerous small aerial battles. By examining Allied and German accounts of the same battles, the author demonstrates which tactics tended to work for both sides as well as the strong and weak points of the various aircraft models engaged in close combat.

The JG 26 War Diary should be required reading for any serious student of the air war over Europe in World War II. For the operational and tactical insights provided into the air war, it is certainly worth the price. Even the more casual reader of military history will find this to be a very useful addition to a personal military library. The several hundred photographs that the author uses to illustrate the book, mostly photos from unit members, makes this book one of the best-illustrated of the World War II aviation histories.

James S. Corum, Professor SAAS, Maxwell AFB, Alabama

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Airline Executives and Federal Regulation. By W. David Lewis, Ed. Columbus: Ohio State University Press, 2000.

This book presents a group of case studies of United States airline pioneers, whose characters were shaped to some degree by their experiences with the federal regulation of civil aviation in this country. The editor selected executives representing large, medium, and small scheduled airlines, and one non-scheduled charter carrier. The periods of regulation addressed include the 1920s, which saw the ideological clash in Congress between Progressive Republicans—who supported the New Nationalism concept of avoiding excessive competition through a system of national controls on the excesses of oligopoly—and the Democrats—who embraced the Wilsonian New Freedom, which sought to promote competition through the dissolution of combines, the encouragement of smaller companies, and the abolition of unfair business practices.

The Air Mail Act of 1925, popularly known as the Kelly Act, and the Air Commerce Act of 1926 constitute the principal legislation of this period. During the Roosevelt New Deal period, the Air Mail Act of 1934 and the Civil Aeronautics Act of 1938 established the basic regulatory framework for civil aviation, which the editor defines as the New Order. A very capital intensive business, the airline industry required stability, predictability, and sustained access to financing. The regulatory regime of the New Order met all of these needs.

Some of the essays cover events extending through the passage of the Federal Aviation Act of 1958 and the Airline Deregulation

Act 1978, but the book's focus is on the earlier, formative periods. Contributors to the volume include recognized aviation historians Roger E. Bilstein, Donna M. Corbett, Michael H. Gorn, George E. Hopkins, Roger D. Launius, William M. Leary, and William F. Trimble, while the editor himself wrote the section on Edward V. Rickenbacker.

The theme of the work is how various airline executive leaders responded to federal regulation in advancing their entrepreneurial objectives. Of particular interest, because so little is known about them today, are the sections on George T. Baker of National, George R. Hann of Capital, Orvis M. Nelson of Trans-oceanic, Robert E. Peach of Mohawk. The essay on Rickenbacker is unusually incisive. Those on Donald W. Nyrop of Northwest, Robert F. Six of Continental, and C. R. Smith of American are useful, but break no new ground.

Arnold J. Grossman, American Airlines

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The Transformation of American Air Power. By Benjamin S. Lambeth. Ithaca, N.Y. and London: Cornell University Press, 2000. [Copyright by The RAND Corp.] Photographs. Notes. Glossary. Index. Pp. xiii, 337. \$29.95 ISBN: 0-8014-3816-0

The dust jacket of *The Transformation of American Air Power* lists testimonials from four former Air Force commanders: Generals Wilbur L. Creech (Tactical Air Command), Russell E. Dougherty (Strategic Air Command), Charles E. Horner (U.S. Space Command), and David C. Jones (Joint Chiefs of Staff). Given the institutional affiliation of these generals, one would expect *The Transformation of American Air Power* to be another polemic trying to demonstrate the dominance of the United States Air Force over the other services in combat. Yet, Lambeth's purpose in this book is to present a joint or "purple" view of the impact on combat of stealth, precision munitions, and improved communications, intelligence, surveillance, and reconnaissance capabilities.

He does not argue that air power is universally applicable to every conceivable national security challenge. Nor does he argue that the greater effectiveness of air operations translates into giving the Air Force a much larger share of the national security budget at the expense of the Army, Navy, and Marine Corps. Indeed, while Lambeth asserts that air power sets the conditions for victory, if applied to its fullest potential from the outset of combat, he acknowledges that arguing for the primacy of an air power strategy in all possible situations "is possibly the single most self-destructive error that air power proponents can make." Ground and naval forces are essential to winning wars.

Smithsonian Press Ad

The Transformation of American Air Power focuses on a period of about forty years, spanning the American experience in the Vietnam War through the conduct of Operation Allied Force over Kosovo. The book contains nine chapters that survey technological developments in aircraft, air-delivered munitions, sensors and information processing, improvements in training, and new operational concepts.

In sum, Lambeth argues that new technologies, better training, and new operational concepts have increased the combat potential of air power—that includes sea-based fixed wing and land-based rotary wing aircraft—relative to that of other force elements to conduct operations against enemy forces. Air power now has strategic effects, that is, decisive operational effects. While acknowledging limitations, Lambeth argues that air power offers the theater joint force commander four great advantages. First, it can supply situational awareness of friendly forces, while denying it to the enemy. Second, it can enforce no-fly zones and engage enemy forces from relatively safe standoff ranges. Third, it can achieve strategic results through simultaneous attacks against a wide range of targets. And fourth, it can maintain constant pressure on an enemy from a safe distance, and achieve a higher number of kills per sortie. Together, these advantages mean that air power can

reduce friendly surface combat losses by degrading enemy forces before the onset of combat, and minimize noncombatant fatalities by using precision munitions.

Benjamin S. Lambeth is a longtime RAND Corporation analyst, author of numerous national security studies, and a pilot who has flown in many aircraft, including F-15, F-16, AT-38, E-3, C-17, F/A-18, B-1B, and AH-1. *The Transformation of American Air Power*, like Lambeth's other research published by RAND, is reasoned and informed. It should be read and thought about by all who are interested in questions of roles and missions and air power in its various manifestations.

Dr. Mark D. Mandeles, The J. de Bloc Group, Fairfax, Virginia.

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Driven Patriot: The Life and Times of James Forrestal. Hoopes, Townsend and Douglas Brinkley. Annapolis, Md.: Naval Institute Press, 2000 [Bluejacket Books, reprint of 1992 ed.] Photographs. Notes. Bibliography. Index. Pp. xvi, 587. \$21.95 Paperback ISBN: 1-55750-334-6

This biography of the first Secretary of Defense [a reprint of the original 1992 edition] follows James Forrestal from his hum-

ble roots in a Hudson River town to his alleged tragic suicide in May 1949. The authors describe his education at Princeton, financial success, tumultuous private life, and nine years of public service in Washington. In chronicling Forrestal's life, the authors describe his inner conflicts, including those that surfaced at Princeton. A poor boy at a rich man's school, he was determined to become wealthy. Also, while at college he disavowed his mother's Catholic faith to embrace the Episcopal religion. Then, within weeks of attaining his degree, Forrestal abruptly withdrew from the university—a perplexing decision that the authors fail to explain.

Most of the book deals with Forrestal's public service. Here the authors are heavily biased in favor of the Navy. They follow Forrestal's career as Navy Under Secretary and later as Secretary. Particularly partisan is their chapter, "The Bitter Fight over Air Power," in which they unfairly attack the Air Force and its first Secretary, Stuart Symington. They accuse Symington of assigning inexperienced Air Force officers "of indifferent quality," to several Joint Staff boards and committees. The authors allege that the air secretary used these tactics to wage a kind of personal guerrilla war against Forrestal.

This argument, however, simply does not make sense. After all, the Air Force was the newest service and did not have a vast

AMU Ad

pool of officers experienced at serving on joint boards. Moreover, how would assigning inexperienced and ineffective officers to these boards benefit the Air Force? To the contrary, Symington regularly tried to show that the new Air Force used modern business techniques. As Assistant Secretary of War for Air in 1946, he established the comptroller function within his headquarters, and then included it at major command headquarters. Symington consistently urged his officers to improve their congressional presentations.

Neither are the authors impartial in their use of sources. For example, they record that Maj. Gen. Emmett "Rosie" O'Donnell, who headed Air Force Public Relations did not like Symington's "ceaseless conniving and immoral" tactics. O'Donnell was later replaced by Steve Leo, whom the authors label as "a propagandist who was responsive to the wild blue yonder elements" in the Air Force. Yet, Air Force sources show that O'Donnell knew of Symington's intent to appoint Leo to head the public relations function. Leo must have been good at his job because Forrestal asked him to head public relations at the Secretary of Defense level.

Additionally, the authors cite journalist Hanson Baldwin's description of Symington's methods as "dirty pool, dirty politics." Baldwin, a graduate of the Naval Academy and a member of the Naval Reserve, can

hardly be considered impartial. Once he called a speech Symington delivered in Los Angeles a "transparent fabrication."

Another contentious area involves the authors' blaming Symington's alleged aggressive conduct and "frenetic pattern of behavior" on high blood pressure. They assert that the high blood pressure was corrected in a risky surgery in 1950. Actually Symington stayed on with the Truman administration in other capacities until running for the U.S. Senate. Moreover, he underwent the serious operation three years earlier—in the spring of 1947.

What really disturbed Forrestal was his inability to bring the services to agree in the summer of 1948. Thus, he had failed to implement what he believed he could do in 1947—make the services put aside their individual interests and reach an accord. The system he believed flawless was defective. He needed more authority and he thus supported amending the National Security Act for this purpose. When Forrestal advocated changing that act, his remaining Navy friends abandoned him, a great emotional loss. He then obsessively and pitifully grasped at straws to delay his departure. Forrestal was in an impossible situation, being too closely affiliated with the Navy for the other services to trust him. Or perhaps he was just the wrong man for such an insurmountable job.

Hoopas and Brinkley admit that they were fortunate to have had access to the research of the late Charles C. V. Murphy. Along with their own investigative efforts they greatly expanded the base laid by Arnold Rogow's adept 1963 book *Forrestal: A Study of Personality, Politics and Policy*. They were also fortunate to have had Steven L. Rearden's superb History of the *Office of the Secretary of Defense: The Formative Years, 1947-1950*, that depicted and analyzed key issues and events challenging the three services and Secretary of Defense during that period. Indeed, without Rearden's massive effort they would still be researching. Still, the book suffers from the exclusion of important Air Force sources, including oral histories and the vital interservice issues, cogently outlined in Herman Wolk's book, *Planning and Organizing the Post War Air Force, 1943-1947*.

Nonetheless, despite its pro-Navy bent, *Driven Patriot* provides much interesting data about an important era in American history and a detailed study of a unique personality of the period.

Dr. George M. Watson, Air Force History Support Office

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AU Press Ad

Books Received

Alf, Herbert A. *Petals of Fire*. [An authentic novel of World War II USAAF flyers.] Roseburg, Ore.: Millennium Memorial Trust, Inc., 2000. Pp. 539. \$45.00 ISBN: 0-9678140-0-6 Soundtrack \$18.00, both \$50.00 www.petal-soffire.com

Bickers, Richard Townshend, Ed. *The Battle of Britain: The Greatest Battle in the History of Air Warfare*. London: Salamander Books, 1999. Photographs. Index. Pp. 272. \$16.95 Paperback ISBN: 0-84065-081-8

Brookes, Andrew. *Air War over Italy, 1943-1945*. London: Ian Allan Ltd., 2000. Maps. Photographs. Notes. Bibliography. Index. Pp. 160. £24.99 ISBN: 0-7110-2690-4

Brookes, Andrew. *Handley Page Victor*. [Postwar Military Aircraft: 6] London: Ian Allan Ltd., 1988 [Reprinted 2000] Diagrams. Photographs. Appendices. Pp. 128. £14.99 ISBN: 0-7110-1803-0

Burrows, William E. *The Infinite Journey: Eyewitness Accounts of NASA and the Age of Space*. Bethesda, Md.: Discovery Books, 2000. Photographs. Index. Pp. 240. \$40.00 Large format. ISBN: 1-56331-924-1

Carland, John M. *Stemming the Tide, May 1965 to October 1966*. [United States Army in Vietnam, Combat Operations] Washington, D.C.: Center of Military History, 2000. Maps. Tables. Illustrations. Photographs. Notes. Bibliography. Index. Pp. xx, 410. \$43.00 GPO S/N 008-029-00354-6

Carter, Ian. *Bomber Command, 1939-45: Photographs from the Imperial War Museum*. Surrey, UK: Ian Allan Publishing, 2000. Photographs. Bibliography. Pp. 160. £19.99 ISBN: 0-7110-2699-8

Donnini, Frank P. *Battling for Bombers: The U.S. Air Force Fights for Its Modern Strategic Aircraft Programs*. Westport, Ct. and London: Greenwood Press, 2000. Tables. Photographs. Notes. Appendices. Bibliography. Index. Pp. xviii, 220. \$62.50 ISBN: 0-313-31221-4

Downing, Taylor and Andrew Johnson. *Battle Stations: Decisive Weapons of the Second World War*. Barnsley, UK: Leo Cooper, 2000. Photographs. Pp. 223. £19.95 ISBN: 0-85052-749-X

Edwards, Paul M. *To Acknowledge a War: The Korean War in American Memory*. Westport, Ct. and London: Greenwood Press, 2000. Bibliography. Index. Pp. x, 176. \$62.50 ISBN: 0-313-31021-1

Fredriksen, John C. *Warbirds: An Illustrated Guide to U.S. Military Aircraft, 1915-2000*. Santa Barbara, Calif.: ABC-CLIO, 1999. Photographs. Appendices. Pp. xiv, 363. \$75.00 ISBN: 1-57607-131-6

Garbett, Mike and Brian Goulding. *Lincoln at War, 1944-1966*. London: Ian Allan Ltd., 1979 [Reprinted 1999] Diagrams. Photographs. Appendices. Pp. 175. £19.99 ISBN: 0-7110-0847-7

Hobart, Malcolm C. *Badges and Uniforms of the Royal Air Force*. Barnsley, UK: Leo Cooper, 2000. Illustrations. Pp. 143. £19.95 ISBN: 0-85052-739-2

Hoopes, Townsend and Douglas Brinkley. *Driven Patriot: The Life and Times of James Forrestal*. Annapolis, Md.: Naval Institute Press, 2000 [Bluejacket Books, reprint of 1992 ed.] Photographs. Notes. Bibliography. Index. Pp. xvi, 587. \$21.95 Paperback ISBN: 1-55750-334-6

Jackson, Kathi. *They Called Them Angels: American Military Nurses of World War II*. Westport, Ct. and London: Praeger, 2000. Photographs. Notes. Appendices. Bibliography. Index. Pp. xx, 211. \$62.50 ISBN: 0-275-96899-5

Jackson, Robert. *V-Force Britain's Airborne Nuclear Deterrent*. Surrey, UK: Ian Allan Publishing, 2000. Photographs. Notes. Appendices. Glossary. Index. Pp. 160. £19.99 ISBN: 0-7110-2750-1

Kawamura, Noriko. *Turbulence in the Pacific: Japanese-U.S. Relations During World War I*. Westport, Ct. and London: Praeger, 2000. Map. Notes. Bibliography. Index. Pp. xii, 173. \$62.50 ISBN: 0-275-96853-7

Knott, Richard C. *Black Cat Raiders of WW II*. Annapolis, Md.: Naval Institute Press, 2000 [Bluejacket Books, reprint of 1981 ed.] Photographs. Notes. Index. Pp. x, 198. \$15.95 Paperback ISBN: 1-55750-471-7

Lambeth, Benjamin S. *The Transformation of American Air Power*. Ithaca, N.Y. and London: Cornell University Press, 2000. [Copyright by The RAND Corp.] Photographs. Notes. Glossary. Index. Pp. xiii, 337. \$29.95 ISBN: 0-8014-3816-0

Levine, Alan J. *From the Normandy Beaches to the Baltic Sea: The Northwest Europe Campaign, 1944-1945*. Westport, Ct. and London: Praeger, 2000. Notes. Bibliography. Index. Pp. xi, 223. \$67.50 ISBN: 0-275-96920-7

PROSPECTIVE REVIEWERS

Anyone who believes he or she is qualified to substantively assess one of the new books listed above is invited to apply for a gratis copy of the book. The prospective reviewer should contact:

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Lewis, W. David, Ed. *Airline Executives and Federal Regulation: Case Studies in American Enterprise from the Airmail Era to the Dawn of the Jet Age*. Columbus: Ohio State University Press, 2000. Photographs. Notes. Index. Pp. xi, 379. \$60.00 ISBN 0-8142-0833-9

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