

SPRING 2023 - Volume 70, Number 1  
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# *Journal of the* Air Force Historical Foundation



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# Air Force Historical Foundation Annual Awards

## June 1, 2023

The Doolittle Awards Presentation will be held at the Air Force Memorial, Arlington, Virginia at 3:00 PM. The event is open to the public, and there is no charge to attend the ceremony. Following this the Foundation's Annual Awards Banquet will be held at the Army Navy Country Club, Arlington Virginia. There will be a Cocktail Hour at 5 PM, and the Dinner/Banquet will foillow at 6 PM The Annual Awards Banquet is open to the public and the ticket information will be available soon. Attire for the evening is service dress/business formal. Check for details at [afhistory.org](http://afhistory.org).



The Air Force Historical Foundation's Annual Awards were established to honor specific individuals and units dedicated to the making and documenting of U.S. Air Force and U.S. Space Force history.

This year's General Carl A. "Tooey" Spaatz Award will go to General Gregory S. "Speedy" Martin (USAF, Ret.)

The Air Force Historical Foundation's James H. "Jimmy" Doolittle Award was established to recognize a unit that has displayed bravery, determination, discipline, esprit de corps, and superior management of joint operations while accomplishing its mission under extremely difficult and hazardous conditions in multiple conflicts, and thus has made a sustained, significant contribution to Air Force history.

This year's General James H. "Jimmy" Doolittle Award will go to the 480 Intelligence, Surveillance, and Reconnaissance Wing at Langley AFB.



### **Reserve the dates, September 15-19, 2023**

The Air Force Historical Foundation Annual Symposium and Air and Space Museum Conference will take place in Denver, Colorado, in conjunction with the Wings Over the Rockies Museum. Look for details to be forthcoming at [afhistory.org](http://afhistory.org).

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FRONT COVER: USAF B-52 drops its load of bombs in Vietnam. (USAF Photo)

REAR COVER: *Operation Homecoming - Return of POWs - Clark AFB 1973* by Maxine McCaffrey. Item number 1973.055 in the USAF Art Collection.)



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## OPERATION PHOENIX and the American exit from Vietnam

Some losses hit harder than others. Last December the Air Force and the Foundation lost one of the rarest of officers. Lt. Gen. Nick Kehoe was kind to all. Nick was a Life Member of the Air Force Historical Foundation and served for five years as First Vice President. His contributions to the Foundation are many and his thoughtfulness and mutual respect for his fellow Board members set the standard for non-profit executives.

Nick was easy to love, easy to be proud of, and the very best at staying humble and giving others a chance to shine. The interest he took in the people whose paths he crossed was extraordinary and he truly had a way of making others feel heard and important. He quietly taught lessons on how to give back in this great big world by just extending his warm friendly smile and his big, beautiful, kind heart. He will certainly be missed, but his legacy will live on in all who knew him. He will never be forgotten. A more extensive story of his life is found on his In Memoriam on page 67.

This year the Foundation will execute its plan to return to the relevance of its original charter. Programs and collaborations are plentiful and powerful. Here we go: To meet AFHF bylaw requirements, the Board of Directors has been reorganized with an eye to creating a vibrant future led by enthusiastic Board members. The reorganized lineup is printed on page 2. Additionally, to handle the expanding roster of administrative tasks and a growing program lineup, we are temporarily splitting Executive Director duties into largely administrative and largely historical in nature. Dik Daso will manage the historical pieces and Steven Newbold has agreed to tackle the administrative effort. Steve has already been heroic in donating his time to the Foundation but now is an official part of the Staff Team.

Our Journal has been renamed and is now, truly, ours. The new title: Journal of the Air Force Historical Foundation—JAFHF for short. This is the inaugural issue for the name, but we will still cover both air and space history topics as well as our regular features. Additionally, only the summer issue will be printed but it will be an expanded “Special Edition” that focuses on the foundation theme for each year. This year, the theme is the end of the War in Southeast Asia (U.S. specifically).

The Foundation will also be taking part in the national Vietnam War event that will be held on the National Mall in May. Make sure you stop by and visit us in our AFHF tent.

The Book Club has a tremendous lineup of Vietnam-related works on tap beginning this February. Additionally, AFHF will launch “War Stories” night. This podcast-styled hour will zoom live in the month opposite the Book Club. Don't miss a single broadcast that will include heroes and experts from the Vietnam period, and will be hosted by Edward R. Murrow Award winner, Matt Jolly.

AFHF, Air University Library, and Air and Space Forces Association (AFA) are working on a collaborative project to archive the collection of photos used over the years in the AFA Magazine and make those images available to all. One particularly impactful use of the collection will be to publish them when needed in the Foundation morning release of This Day in History. ASFA will also be able to use them for the same purpose. In fact, AFHF has initiated an effort to automate your morning entries for “This Day in History.” In collaboration with AFA Magazine and with the help of volunteers, the effort has begun and will be used by both organizations when it is completed sometime next year.

An AFHF/AU Press joint effort has been initiated to electronically reprint significant historical works under a recognizable, co-branded, imprint that will expand and develop over the next few years. We are currently exploring the possibility of reprinting DeWitt Copp's, *A Few Great Captains*, one of the truly classic examinations of early airpower leadership. AFHF has begun a program with the University of Alabama to archive the Hap Arnold collection from his home in Sonoma. The effort is already underway and can be viewed on the research section of our website. Additionally, other unique collections will find a home in this archive, and all will be publicly available.

The Foundation is expanding the literary awards program this year. Book and article prizes are being offered for the winner of a nationwide competition. We are searching for the absolute best recent published works in air and space history—those few that push the envelope of scholarship and offer new ways of looking at the history of our service. The I.B. Holley Award and the AFHF Book and Article Prizes will be presented at the Fall Symposium in Denver.

The AFHF website is ever expanding. Within the site one may find the Book Club archive, a variety of video presentations and links to YouTube products related to our history. Soon, a new page will present a book listing of works written by AFHF members over the years. It is already amazing and will continue to grow. Soon AFHF will transition to a different payment method for dues and web purchases. The transition will be seamless and more secure than our current method. We are currently seeking participants for the AFHF 9/12 oral history program. If you have a post-9/11 story to tell, go to the website, follow the self-posting instructions, and tell the membership what you did after that event. Gen. Holmes has set the standard for these, and his oral history can be viewed on our research portal.

AFHF and the USAF Academy Department of History Alumni are now officially affiliated organizations. This crucial step harkens back to the original 1953 AFHF charter.

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For the first time since COVID began, we are regenerating the AFHF Symposium. This fall it will be held in Denver and hosted by Wings over the Rockies (an AFHF affiliated museum). It will include traditional historical presentations, a selection of museum talks about individual Vietnam War exhibits, and a special awards presentation evening at Wings Over the Rockies--even including an aerial demonstration (weather permitting), exhibit tours, a mini-airshow and much more. By including the museum community, we hope to expand our affiliations with air and space museums across the country.

Everyone should be looking forward to our inaugural JAFHF "Special Edition" that will be printed and distributed as the Summer Edition of the Journal. Throughout the year, AFHF will highlight the end of U.S. participation in Vietnam across a wide range of programs and events. We hope to see you at one of them!

Gen. James "Mike" Holmes  
Foundation Chairman

Jonna Doolittle Hoppes  
Foundation President

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## From the Editor

In this issue, we tend toward the world wars of the 20th century. We hope you enjoy the various subjects and interesting illustrations.

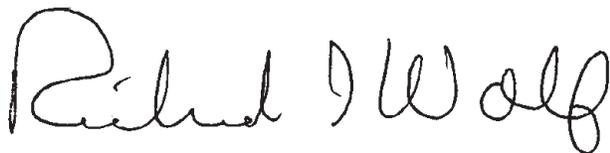
We start with an article by return contributor William Cahill, who this time is writing about the development of the B-17 Flying Fortress. It's a very interesting bit of history.

Our second article is by first-time contributor Alexander Buschor, who writes about how first world war experiences influenced the development of the culture of airmen.

Our third article is by repeat contributor John Chamberlin, who writes about a memoir of the air war in North Africa from the viewpoint of a B-25 crewman.

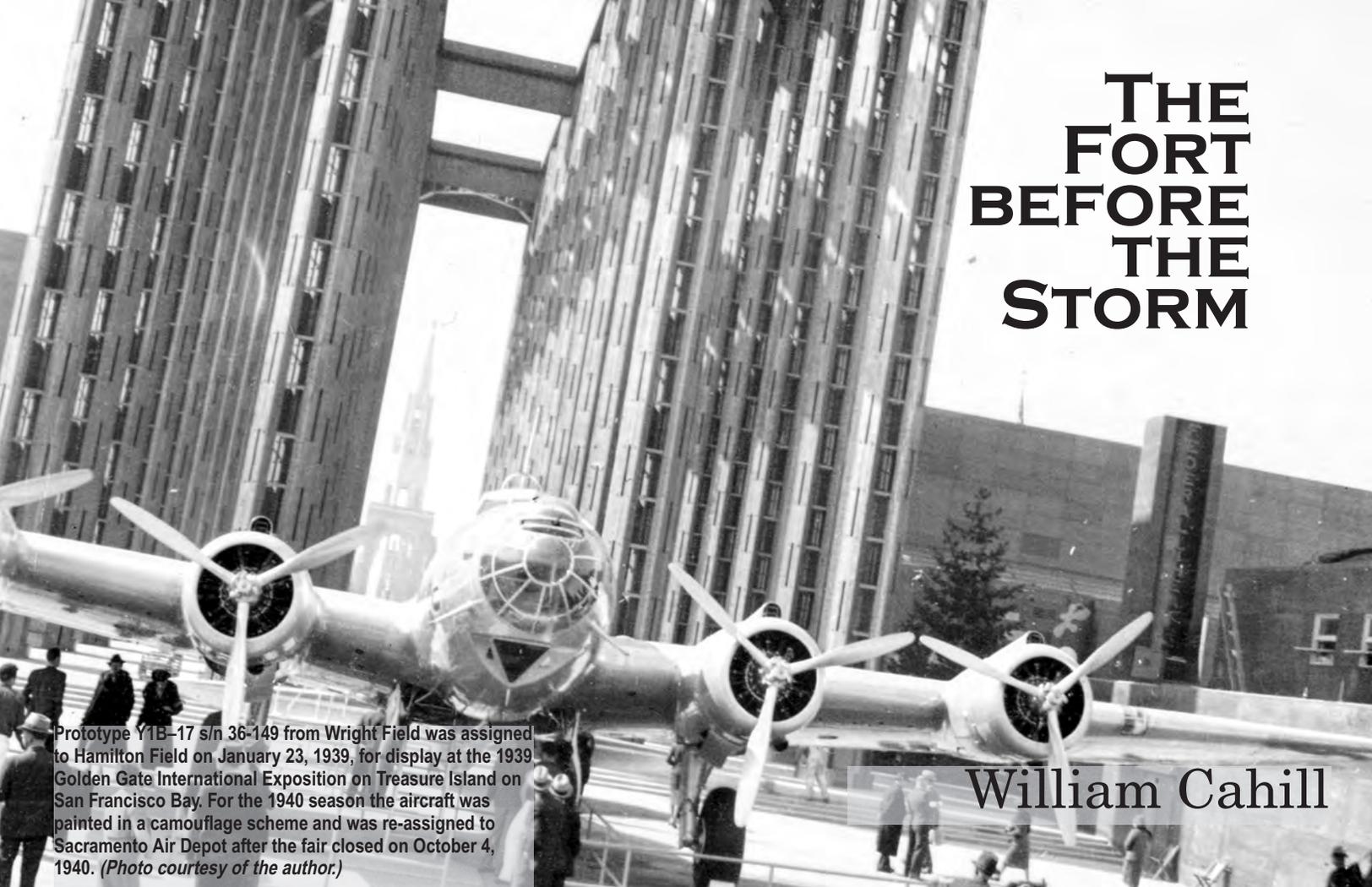
Our fourth article is a rather lengthy piece by aeronautical expert David Reade, who tells the story of Joseph Duckworth, and the myths surrounding who actually first flew into a hurricane to take observations.

The Leadership's Message begins on page 3. It's worth the read to keep you abreast of our changes. Our publication plans have evolved to try and keep our publication relevant and attract new members. Only the Summer issue will be printing in hard-copy this year, but it will be about twice the size of the normal issue, and centered around the Foundation's theme for the year. This year's theme is the fifty-year anniversary of the end of the war in Vietnam. So we will have our regularly scheduled content and a collection of scholarship on the theme of the year. Don't miss Upcoming Events on page 680. And the issue closes with the Mystery. Enjoy!



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# THE FORT BEFORE THE STORM



Prototype Y1B-17 s/n 36-149 from Wright Field was assigned to Hamilton Field on January 23, 1939, for display at the 1939 Golden Gate International Exposition on Treasure Island on San Francisco Bay. For the 1940 season the aircraft was painted in a camouflage scheme and was re-assigned to Sacramento Air Depot after the fair closed on October 4, 1940. (Photo courtesy of the author.)

William Cahill

Arriving at a critical juncture in American air power history, the Boeing Y1B-17 and B-17B enabled the Air Corps to prove out air power theories on strategic bombing, laying the groundwork for Eighth, Fifteenth and Twentieth Air Force operations in the Second World War. Though small in numbers, these aircraft and their bomb groups demonstrated what was capable with a force possessing the range, payload and speed of a contemporary heavy bomber. Before the bombers could be introduced, though, some organizational house cleaning needed to be done within the Air Corps. After the First World War American aviation leaders were convinced of the power of an independent strategic bombing campaign. Hampered by a lack of funds and support from the military establishment, the air power zealots looked to move their position forward incrementally. The opportunity for such a move took place in 1935 through two separate events – one organizational and one doctrinal in nature.<sup>1</sup>

The General Headquarters Air Force (GHQ AF) was activated on March 1, 1935 and organized all combat squadrons in the continental US into three wings, with the commander GHQ AF reporting to the Chief of Staff, US Army in peacetime and Commander of Field Forces in wartime. A product of the 1934 'Baker Board,' the GHQ AF provided a limited step toward an autonomous air force, but also kept authority divided by maintaining control of supply, doctrine, training and recruitment under the Chief of the Air Corps, and airfields under the jurisdiction of corps area commanders. Two bomber groups were located in the 1st Wing in California at March (19th Bombardment Group [BG]) and Hamilton (7th BG) Fields and two with the 2nd Wing (2nd BG at Langley Field, Virginia, 9th BG at Mitchell Field, New York). Starting in July 1935 these bomb groups were equipped with the Martin B-10/B-12, the Air Corps' first mass-produced all-metal monoplane bomber and a dramatic advance over the 'Keystone' fabric-covered biplanes it replaced.

GHQ AF was seen by airmen as a highly mobile force of great striking power, charged to operate 1) beyond the sphere of ground forces 2) in immediate support of ground forces 3) in coastal defenses and in other joint Army and Navy operations. The Air Corps saw its primary role as using bombardment aircraft to attack the enemy as far from America's shores as possible. Long range bombardment could also operate against enemy bases and supply lines and was seen as critical to reinforce America's overseas territories and western hemisphere bases in Alaska and the Caribbean.<sup>2</sup>

The birth of the GHQ AF was followed by the promulgation of the Joint Action of the Army and Navy, a doctrinal agreement prepared by the Joint Board and approved by the War and Navy Departments in mid-September 1935. It was agreed that the Air Corps would operate as an arm of the Army, both in the conduct of air operations over the land in support of ground forces and air operations over the sea in direct defense of the coast, with Air Corps temporarily executing Navy functions in support of or in lieu of Navy forces. The document noted the Air Corps would maintain aircraft "designed



B-17 ship 80 assigned to the 49th BS parked along the Langley Field flight line in May 1939. The month prior the 2nd BG deployed ten B-17s to Providence Airport, Rhode Island to search for and attack Navy ships acting as the enemy fleet as part of Coastal Frontier Defense Air Exercise No. 5 (Minor Joint Air Exercise No. 1). Held in New England and New York sectors, the exercise was designed to test joint coordination as defined by the Joint Action of the Army and Navy plan from 1935. (*National Archives and Records Administration. Subsequently noted as NARA.*)

for use in support of military operations, or in the direct defense of the land and coastal frontiers of continental United States and its overseas possessions.”<sup>3</sup> Air Corps support included defensive and offensive missions, with the latter composed of the Striking Force and its heavy bomber and reconnaissance aircraft tasked with finding and engaging the enemy fleet. The coastal frontier defense mission articulated in the Joint Action merely codified what had already been occurring over the prior decade.

Joint Army-Navy air operations overseas in Hawaii and Panama in the late 1920s and early 1930s confirmed the role of airpower in defending American possessions and territories. Missions assigned to overseas Air Corps composite wings included inshore and offshore patrols, range finding and spotting missions for coast artillery, bombing, and support to ground forces. Overseas observation squadrons, soon recast as long range reconnaissance squadrons, were given the task of dispersing to far-flung airfields and detecting the approaching enemy fleet. The Air Corps Command and Staff Exercise of 1933 was conceived to demonstrate the ability to rapidly concentrate airpower within the continental US to perform reconnaissance and coastal defense against an enemy fleet and aircraft. Conducted at March Field, CA, from May 8 to May 26, nine tactical groups plus the Air Corps Tactical School contributed 261 pursuit, observation and bombardment aircraft to the multi-week exercise. Organized and desig-

*William Cahill is a retired Air Force intelligence officer who contracts for DoD in the Washington D.C. area. An Intelligence Weapons Officer with squadron and wing-level experience, he has also served on the Air Staff and in an inter-agency capacity outside of DoD. Mr. Cahill is a graduate of San Jose State University and has MS degrees from Embry Riddle Aeronautical University and the National Defense Intelligence College. Mr. Cahill has been published in Air Power History, FlyPast, the USAF Weapons Review and C4ISR Journal.*



Ship 50 of the 20th BS runs up its engines on the runway at Langley Field in February 1938. Later in February group commander Lt Col Olds led a flight of six B-17s from Langley Field to Argentina via Miami, Florida and Lima, Peru, one of many long distance international flights undertaken by the 2nd BG with its new bombers. (*NARA*)

nated the GHQ Air Force (Provisional), the exercise included 45 Keystone B-4/B-6 bombers deployed by the 2nd and 7th Bomb Groups and contributed to the birth of the GHQ AF two years later.<sup>4</sup>

The publication of the 1935 Joint Action gave the Air Corps the opportunity it had been looking for to justify going forward with a four engine bomber to support the coastal frontier defense mission as well as the mobile army. Though these requirements were defensive in nature, this aircraft could easily be used in a strategic bombardment role and was critical in being able to range out to 1000 miles from the coast. This aircraft was also ideally suited for the long range reconnaissance role envisioned for frontier defense – finding and locating the enemy. Long range bombardment could also operate against enemy bases and supply lines and were seen as crucial to reinforce Alaska, Hawaii, Panama and Caribbean.

The newly-established staff of the GHQ Air Force at Langley Field luckily had a four engine bomber already in mind – Boeing’s Model 299. The Air Corps had just started operating the B-10 when it started shopping for a replacement. In August 1934, barely two months after the Martin twin engine bomber entered service, the Air Corps asked for proposals from manufacturers for a multi-engine bomber capable of reinforcing the air forces in Hawaii, Panama, and Alaska. Requirements were for the aircraft to carry a 2,000 lb. bombload at a range of at least 1,020 miles with a top speed of at least 200 mph, though the desired range was 2,200 miles. The outcome of the competition was to be determined by a “fly-off” in autumn 1935 and resulted in three promising entries: the Martin Model 146, an improved B-10; the Douglas DB-1, another twin engine bomber based on the DC-2; and the Boeing Model 299, a four engine bomber and refined sibling of the developmental four engine Boeing XB-15.<sup>5</sup>

The Boeing Model 299 was the hands-down winner in the eyes of the Air Corps even after the prototype crashed on October 30, 1935. GHQ Air Force commander Maj Gen Frank M. Andrews argued the Model 299 was needed for coastal defense of the continental United States and its possessions and reinforcement of Hawaii, Alaska and



B-17 assigned to the 20th BS soaks up the sun at Langley Field, circa 1938-39. Starting in 1937, Air Corps markings became more colorful. In the summer engine cowlings were painted with the squadron color, with white being assigned to the 20th BS. The use of tail codes for groups started in December, with "BB" being assigned to the 2nd BG. (NARA)

Panama. Andrews carefully avoided mention of bombing doctrine though the airmen recognized the primary role of the four-engine bomber would be strategic bombing. The War Department could not be won over to procure the requested 65 Boeing bombers and in their place 133 Douglas DB-1 aircraft, designated B-18, were ordered. As a consolation prize, on January 17, 1936 thirteen of the Boeings were ordered as service test aircraft and designated YB-17s. Re-designated Y1B-17 after November 1936 to denote its service testing, the YB-17 incorporated a number of changes from the Model 299, including more powerful Wright R-1820-39 Cyclone engines.<sup>6</sup> The Air Corps was not done fighting for the four-engine Boeing, for later in 1936 in their Fiscal Year 1938 budget submission airmen asked for eleven B-15 and 50 B-17 bombers for reinforcement of Hawaii, Alaska and Panama. Once again the Air Corps was spurned, being advised there was no requirement for such long range bombers and to re-submit the request when the international situation warranted.<sup>7</sup>

The first Y1B-17 was delivered to Wright Field, Ohio for experiments, arriving January 18, 1937. Between March 4 and August 5, 1937, the remaining 12 Y1B-17s were ferried by their new crews from the Boeing plant at Seattle, Washington to the 2nd BG at Langley Field for operational development and flight tests. The new Boeing bombers carried five tons of bombs and mounted five machine guns (either .30 or .50 inch) in the nose turret and side, dorsal and ventral blisters.<sup>8</sup> The 2nd BG took time to integrate the new bombers into the organization, which consisted of Headquarters Squadron and 20th, 49th, and 96th Bomb Squadrons. When all the Boeings were delivered in August, HQs Sqn had one aircraft, the 20th and 96th four, and the 49th three.<sup>9</sup> The B-10Bs remaining at Langley were then transferred out of the 2nd BG. Training of combat crews continued through the end of the year and, with service testing complete, the aircraft were redesignated B-17. A fourteenth Y1B-17 originally constructed for ground testing of the airframe's strength was upgraded by Boeing with exhaust-driven General Electric turbo-superchargers and designated Y1B-17A. The aircraft flew test flights in 1938 and was delivered to Wright Field in



B-17B Ship 81 of the 49th BS parked at Albrook Field, Panama on November 11, 1939. Ship 81 was one of three B-17Bs and four B-17s the 2nd BG flew to Rio de Janeiro, Brazil for participation in the 50th Anniversary of the founding of the Brazilian Republic, a long range mission typical of those flown by the 2nd BG with its four engine bombers. (NARA)

February 1939, joining the 2nd BG at Langley the following February. The testing of the turbo-superchargers was deemed a success and all subsequent B-17s were fitted with this engine accessory, allowing higher altitude flight.

The 2nd BG was under pressure from Maj Gen Andrews to prove the value of the four engine bomber and develop long range bombing techniques – along with promoting the cause of air power. Within a week of delivery to Langley the first Y1B-17 was flown to Bolling Field in the District of Columbia to display the Air Corps' latest bomber. A week later, on March 16, 1937 2nd BG Commander Lt Col Robert Olds led four of the bombers on a trip north to Augusta, Maine, west to Cleveland, Ohio, then back to Langley via Pittsburgh, PA and Richmond, VA, crossing over 20 cities in the eleven hour flight. Towards the end of the year, six Y1B-17s were used in an aerial fly past of the GHQ AF over New York City for an American Legion convention on September 20-23, 1937.<sup>10</sup> While US overflights did help with navigation and gaining flight hours for the new bomber crews, something more dramatic was needed to highlight the capability of the B-17.

The summer of 1939 the B-17 was chosen to break a series of records to help celebrate 30th anniversary of the Air Corps and its predecessors. On July 23, Lt Col Olds piloted a B-17 to 24,034 ft with a payload of 5,000 kg while two days later Capt Alva Harvey carried 5,000 kg, 2,000 km at an average speed of 200 mph. On August 1 Capt Clarence Irvine flew the turbo-supercharged B-17A to break two international records, soaring to an altitude of 34,025 ft with a payload of 5,000 kg and carrying 5,000 kg, a distance of 2,000 km at an average speed of 166 mph on a closed circuit.<sup>11</sup> The records showcased the performance of the bomber, the B-17 clocking in a cruising speed 25 mph faster than the B-10 with over double the range. Records were one part of proving out the capabilities of a four engine bomber, but something else was needed to demonstrate its utility to the military and the defense of the United States. The Air Corps found that in long range international flights.

International flights were not new to the Air Corps. Following their delivery to Wright Field, Lt Col Henry 'Hap'



Two B-17B aircraft of the 32nd BS, 19 BG in formation over March Field, Riverside, California circa 1940. In October 1940 the 2nd BG transferred the majority of its B-17s and B-17Bs to the 19th BG, greatly expanding the capacity of this California-based bomb group. (NARA)

Arnold picked up ten YB-10s and flew them to Alaska and back in the summer of 1934. International flights were also in order – the 2nd BG flew its B-10Bs to Panama and back in February 1937. The B-17, though, added a new dimension in range and speed. The State Department requested a goodwill flight to Buenos Aires for the inauguration of Roberto Ortiz as president of Argentina. Lt Col Olds led a flight of six B-17s from Langley Field to Argentina via Miami, Florida and Lima, Peru in February 1938. The flight of over 10,000 miles earned the 2nd BG the McKay Trophy and Olds a Distinguished Flying Cross. On a trip running from August 5-11, 1938 Majors Harold George, Caleb Haynes and Vincent Meloy flew three B-17s from Miami to Bogota, Colombia via Cuba. The 1,600 mile flight was covered in eight hours, with the return journey passing through Panama enroute to Miami. On July 15, 1939 Maj George led a flight of three B-17s from Newark, New Jersey to Rio de Janeiro, Brazil to return Brazilian Army General Goes Monteiro back home after his trip to the US.<sup>12</sup> These flights, with long over water legs, highlighted the projected role – at least on paper – of the bomber: coastal defense.

## Operations

It was natural that the Air Corps would integrate the YB-17 into ‘coastal defense’ missions to validate existing doctrine as well as promote the need for additional four-engine bombers. In August 1937 Joint Air Exercise No. 4, a Joint Army-Navy exercise, took place off the coast of California. 1st Wing Commander Brig Gen Delos Emmons led the Air Corps effort from Hamilton Field with thirty B-10s, seven Y1B-17s, four B-18s and three amphibians. The Y1B-17 contingent, deployed cross-country from Langley Field and led by Lt Col Olds, flew from the municipal airport in Oakland, CA while the B-10s flew from Hamilton Field. The Navy provided 30 patrol aircraft from Patrol Squadron 7 to aid in the hunt for the ‘enemy fleet,’ represented by the target ship *Utah*. The Pacific Ocean provided



In August 1937 Joint Air Exercise No. 4, a Joint Army-Navy exercise, took place off the coast of California. Lt Col Olds led the Y1B-17 contingent of seven bombers from Langley Field to California. Enroute the bombers stopped at March Field, with six of the seven Boeings seen here on the March flightline on August 5, 1937. (NARA)

a degree of camouflage via its weather, with Navy patrol aircraft periodically tracking the old battleship as it moved in and out of squalls and fog. Eventually the *Utah* was found and attacked by Olds’ Y1B-17s with minutes left before the exercise concluded, the B-10 force arriving too late to make their attack. Later in the year, another joint exercise was held off the East Coast. The November 1937 Joint Air Exercise No. 5 encompassed the Chesapeake Bay region and the mid-Atlantic coast with 2nd BG Y1B-17s flying from their home station. The Boeing bombers were used to perform reconnaissance missions up to 200 miles off the coast in search of battleships USS *Texas* and *New York*.<sup>13</sup>

Over water reconnaissance wasn’t just confined to joint exercises. On May 19, 1938, Maj Gen Andrews ordered a flight of three B-17s to intercept and make simulated attacks on the Italian liner *Rex* in the Atlantic Ocean inbound to New York. Major Haynes lead the flight with Lt Curtis LeMay as his navigator. The B-17s located the *Rex* 725 miles from shore and buzzed it for the sake of the National Broadcasting Company announcer and New York Herald Tribune reporters carried aboard the three bombers. The following month, three B-17s intercepted the liner *Queen of Bermuda* 300 miles out to sea on June 12, 1938.<sup>14</sup> The coastal reconnaissance mission started to cause friction with the US Navy and their patrol aircraft, brewing over during planning for Joint Coastal Frontier Defense Air Exercise No. 5 (Minor Joint Air Exercise No. 1). Held April 17-21 1939 in New England and New York sectors, the exercise was designed to test joint coordination as defined by the Joint Action of the Army and Navy plan from 1935. Cooler heads in Washington prevailed and kept inter-service rivalry in check, allowing the exercise to continue. Ten 2nd BG B-17s deployed to Providence Airport, Rhode Island to search for and attack Navy ships acting as the enemy fleet. Considered valuable training for hemisphere defense, the missions highlighted the need for well-trained crews required for precise over-water navigation. The year wrapped up in late August 1939 with thirteen B-



The 19th BG's 38th RS had joined the 7th BG's 88th RS for two months of maneuvers in Arizona in early 1941. The first four aircraft belong to the 38th RS, while the last two are from two of the 19th BG's bomb squadrons, the 30th and 32nd BS respectively. (NARA)

17s deploying to Oakland, California to work with 17th BG B-18s in a Joint Army-Navy Exercise for five days. 2nd BG crews and aircraft were joined by newly-trained 19th BG crews as they prepared to receive their own four engine bombers.<sup>15</sup>

In between joint exercises and long distance flights, the 2nd BG kept its B-17s busy with local exercises and test work. In May 1938 Langley's B-17s donned water soluble camouflage and participated in GHQ AF air defense maneuvers. On December 13, 1938 the 2nd Wing held a bombing exercise, with bombers organized into a "Provisional Group" with one bomb squadron composed of nine B-17s from the 2nd BG and two of B-18As from the 9th BG. The target was on Plum Tree Island, 250 miles from Langley, and protected by notional batteries of anti-aircraft artillery. The B-17s attacked between 14,000 and 18,000 ft, easily "destroying" the target. Three B-17s also participated in a January 1939 air defense exercise, playing targets to the P-35/P-36 pursuit aircraft of the 1st Pursuit Group at Selfridge Field, Michigan. The experience gained by the 2nd BG in operating its B-17s was viewed as an Air Corps resource and was often tapped for the development of new tactics. In May 1939 GHQ AF asked for assistance in investigating blind bombing, with the 2nd BG publishing a report in August 1939 centering on precise navigation and bombing to counter overcast. The following year the bomb group provided a lengthy response to an Air Corps request for recommendations on maps and charts, the Langley flyers' extensive navigation experience providing a comprehensive response.<sup>16</sup>

## Enter the B-17B

Opposition to the Air Corps' ambitions for the acquisition of more four engine bombers faded by the time the delivery of the Y1B-17s was completed and in August 1937 ten additional bombers, now designated B-17B, were ordered. The aircraft were redesigned with larger flaps and rudder and the navigator's position moved to the



Six Y1B-17's in formation over New York City for an American Legion convention on September 21, 1937. The lead bomber, "10" is from the Headquarters Squadron and leads two Y1B-17s from the 49th BS. The second group of three bombers is from the 20th BS. Final deliveries of the Y1B-17 to Langley Field had only occurred the month prior. (NARA)

front of the aircraft which was now topped with a new framed Plexiglas nose. Provisions were made for the inclusion of an engine turbo-supercharger, scheduled to fly on the 14th Y1B-17 at Wright Field. The order was increased to 13 before delivery, with two additional batches of 13 raising the number of B-17Bs to 39. All 39 of the B-17Bs were delivered to the Air Corps between July 29, 1939 and March 30, 1940. The first example, s/n 38-211, was retained at Wright Field for tests as was s/n 38-269 in January 1940. The delivery of the B-17B was significant as it moved the Boeing bomber from a developmental aircraft flying operational evaluation of heavy bombers to a front line combat aircraft equipping multiple bomb groups. To reflect this, the Air Corps designated the 2nd, 7th and 19th Bomb Groups as heavy bomb groups on December 6, 1939.

The first two B-17Bs in operational use went to the 2nd BG in August 1939, with a total of ten delivering to Langley Field by May 1940. The 2nd rapidly integrated the new bomber into its operations, with Lt Col Olds leading a flight of three B-17Bs and four B-17s to Rio de Janeiro, Brazil for participation in the 50th Anniversary of the founding of the Brazilian Republic in mid-November 1939. The flight, accompanied by GHQ AF Commander Maj Gen Emmons, enabled more long range navigation practice as well as exploration of the Natal region at the narrowest part of the Atlantic between South America and Africa – a critical air ferry route in the coming years. The 2nd BG also flew a flight of B-17s from Washington, D.C. to Albrook Field, Panama in late December 1939, with a similar flight by a single B-17 flown for the Chief of Staff of the Army to Albrook then on to Borinquen Field, Puerto Rico in early February 1940. The 2nd BG continued supporting exercises as well. The GHQ AF was tasked with providing the 'red force' for air defense maneuvers in Harrisburg, Pennsylvania in fall 1939. Though multiple squadrons were requested, three B-17s and nine B-18As arrived to play the role of aerial targets. GHQ AF also directed the 2nd BG to send one squadron to Reno, NV to support a Joint Army-



A 20th BS B-17 parked on ramp at Langley Field with the large airship hangar in the distance and a B-17 of the 96th BS in the foreground of this early February 1938 photo. The 2nd BG had received its last Y1B-17 six months prior and was about to head into a very busy spring with international flights, GHQ AF exercises, and the interception of the Italian liner Rex all to occur over the next three months. (NARA)

Navy Exercise to be held January 13-28, 1940. The 20th BS was chosen to support and flew eight B-17s cross-country through inclement weather. As had become usual for this line of work, the Boeing bombers performed search missions off the central California coast. With these taskings in mind, as part of its expansion as a heavy bomb group the 2nd BG was joined by the 41st Reconnaissance Squadron (RS), activated on February 1, 1940.<sup>17</sup>

Next to receive the B-17B was the 19th BG, with the March Field unit receiving its first example in September 1939 and taking delivery of its fifteenth airframe in March 1940. The 19th had been introduced to the Flying Fortress in April 1939 when a group of officers from the 2nd BG arrived at March Field with a handful of B-17s and checked out California-based officers with more than 2,000 flight hours on their future bomber. After delivery of the first B-17B to the group's 30th BS, the 19th BG was ordered to activate a third tactical squadron, the 93rd BS.<sup>18</sup> At that time sharing ramp space with the 19th BG at March Field was the 28th Composite Group, constituted on December 22, 1939 and activated on February 1, 1940. Assigned to the group and activated on the same date was the organization's bomber component, the 36th BS. This squadron was assigned four B-18s and two B-17s, but when it moved to Lowry Field, Colorado it left behind its four engine bombers. The 7th BG was the last group to equip with the type, receiving one example at Hamilton Field in late November 1939, with the remaining eleven delivering the following spring. The unit was considered equipped as a heavy bomb group by June 1, 1940, with plans to reach its full complement of 26 bombers by December. On September 7, the unit transferred from Hamilton Field to Fort Douglas, located outside Salt Lake City in Utah. The next month two B-17Bs were transferred to the 7th BG from the 2nd BG and assigned to the 88th RS. In late January 1941 the group's reconnaissance squadron, the 88th RS, moved to Tucson, Arizona for two months of maneuvers.



Three B-17's in formation, with the group ship leading two of the squadron command ships for the 20th and 96th BS. This September 1938 image was taken near March Field, California on a cross-country flight from Langley Field. The 19th BG at March Field would receive their first B-17B aircraft a year later on September 5, 1939. (NARA)

Though the B-17B had entered operational service, testing and upgrade work continued with the aircraft. In August 1940 the 19th BG dispatched two B-17Bs to the Sacramento Air Depot for a month of upgrade work before deploying them to Ladd Field, Alaska in October 1940, likely for cold weather testing. Many B-17Bs were modernized with features such as the flush-type side openings for 0.50-inch machine guns that had been introduced on the B-17C, with all B-17Bs rotating through either Boeing or the Sacramento Air Depot in July-August 1941.

Though there was value in joint exercises with the Navy, the Air Corps saw little utility in having its heavy bomb groups participate in large-scale Army maneuvers; doctrinally, this type of support was the job of the attack group assigned to Barksdale Field in Louisiana. The lack of bomber play in the summer 1939 First Army maneuvers appeared to cause some consternation amongst Army Staff in Washington. As a result, in early October 1939 the 19th BG flew in support of the Third Army Maneuvers in Louisiana. The Louisiana maneuvers continued in 1940 in two parts. The first part, held in May, featured 2nd BG support with eight B-17s and three B-18s flown from Barksdale Field with all group squadrons participating. The second part, held in August, was supported by eight B-17Bs of the 19th BG. The month prior, the 19th had supported the First Army maneuvers with four missions. Heavy bomber employment in these maneuvers was done to train ground observers, anti-aircraft artillery, and radar in an air alert net. GHQ AF staff complained "few of the objectives justified use of medium bombardment aviation; none of the objectives were suitable for employment of heavy bombardment." Satisfied that his bomb groups at least tried to be team players in 1940, GHQ AF Commander Lt Gen Emmons protested to the Chief of the Army Air Forces and requested relief out of the 1941 maneuvers due to the impact it would have on expansion training of new units.<sup>19</sup> The Air Corps was no longer focused on long distance flights or finding targets at sea – it was growing in preparation for war.



Left side view of B-17 attributed to Hamilton Field in 1940. The aircraft carries the “BG/1” tail markings associated with 7th Bomb Group and the terrain looks appropriate. The 7th BG received the majority of its B-17Bs in February-March 1940 before moving to Utah in September. The aircraft externally resembles a B-17C, though these were not delivered to the 7th BG for another year as were the upgrades to the ‘B’ model to replace ‘blister’ gun positions with flush ones. (AFHRA via George Cully)

## Expansion

In November 1937 GHQ AF Commander Maj Gen Andrews submitted relatively modest proposals for growth in the 1940s, seeking to grow to eight bombardment groups by 1945 – in alignment with the Drum Board findings of 1933. This doubling of the bomber force was centered on medium bombers, and in April 1938 Congress authorized the first phase of expansion. One year later, the plan was expanded with another bill signed by Congress in April 1939 that looked to grow to 24 tactical groups.<sup>20</sup> The Air Corps had started on a dramatic journey of expansion, with new programs rolling out before the prior one was completed. On June 1, 1939 the GHQ AF started to grow, looking to use the B-17Bs scheduled to deliver at the end of the year to expand from one heavy bomber group to three by June 30, 1941.<sup>21</sup> The 1939 expansion program was superseded by the 54 Group Program in July 1940, essentially a doubling of the prior program. Groups were to furnish cadres for the formation of new combat groups, with new units activating at the parent base. The new units would remain there, training personnel and acquiring equipment, not transferring to their new permanent stations until facilities were ready to accommodate them and sufficient aircraft were on hand to be self-sustaining. A massive influx of new recruits were assigned to the parent unit to backfill the cadres assigned to the new units.

Planned within the 54 Group Program were ten heavy bomber groups – quite a task for the three heavy groups, two of which had only just started operating heavy bombers. The burden of training would mainly fall on the 2nd BG and Langley Field. The heavy bomber force started its enlargement at the end of 1939, with two new bomb groups being constituted on December 22, 1939 and activated February 1, 1940 – the 25th and 29th Bomb Group (H) at Langley Field. Training started in earnest, using the B-17s and B-18s assigned to the 2nd BG along with A-17s, surplus from attack groups and used for pilot proficiency in the rapidly expanding Air Corps. Endless training sorties were flown to the local bomb ranges to start honing



Arrival ceremony for the first Y1B-17 assigned to the 2nd BG at Langley Field on March 4, 1937. The Y1B-17 delivery was an inflection point for American airpower, starting the rise of the American bomber fleet that culminated over Japan in summer 1945. (AFHRA via George Cully)

the skills of the new bomber crews. On May 14, 1940 the 29th BG moved to MacDill Field, Florida, taking with it four B-17s, leaving Langley with eight B-17s, ten B-17Bs and the lone B-17A that arrived in February 1940 after testing was completed at Wright Field. This B-17 fleet was split between the 2nd and 25th Bomb Groups, with the 25th BG carrying on its books on June 1 five B-17s, five B-18s plus BT-14s and A-17s for training. In a May 8, 1940 GHQ AF directive on combat readiness, the 2nd BG was not included in the sparse list of units contained within the “advance combat echelon” that placed readiness for combat over expansion training. Since it was not part of this echelon, the 2nd Bomb Group was ranked as “3rd Priority” for combat readiness and was not brought up to strength in personnel and tactical equipment.<sup>22</sup>

The 41st RS was activated on February 1, 1940 based on personnel contributions from the Second Wing’s Langley-based 21st RS, with the reconnaissance squadrons splitting five B-17 type aircraft for flight training. This left the 2nd BG with nine B-17 type aircraft and three B-18s. With these aircraft, the 2nd BG worked to train up the newly-assigned airmen that had filled the group’s personnel books after the transfer of airmen to the two new bomb groups. On August 5, 1940 the 2nd BG flew ten B-17Bs in a mass flight to Selfridge Field for training navigators, following up on August 16 with a flight of eight B-17Bs to Barksdale Field. On October 16, the 25th BG was re-assigned to Borinquen Field, Puerto Rico and re-designated a medium bomb group, having swapped its B-17s for B-18s in late July.

The 2nd BG was about to change in a dramatic way the second week of October 1940. The month prior the group had been notified that it was losing all of its B-17/A/B airframes for replacement by B-18As. The news hit Langley like a bomb, striking the morale of the proud unit that had brought the four engine bomber into operational existence for the Air Corps. On September 30 training started for the ferry mission and on October 8 nine B-17Bs departed Langley for March Field for “permanent assignment” to the 19th BG. The remaining B-17s and the B-17A departed later the same day, leaving Langley eerily quiet. The last two remaining B-17Bs departed for the 7th



President Franklin Roosevelt inspecting bombers of the 2nd BG at Langley Field, July 1940. The Presidential motorcade has passed three B-17s of the 96th BS and is pausing in front of the prototype YB-15. The 2nd BG was winding down operation of the B-17, having transferred four airframes the month prior when the 29th BG departed for MacDill Field; all remaining B-17s would depart within three months. (AFHRA via George Cully)

BG at Salt Lake City the following week. The 29th BG at MacDill also surrendered its four B-17s during the same time period, flying them out west to join their brethren at March Field. The following month the relatively empty Langley airdrome saw the 34th and 43rd Bomb Groups constituted on November 20 and activated on January 15, 1941. Out west, things were not quite as hectic as Langley Field but there still was a flurry of activity.<sup>23</sup>

From its new home at Fort Douglas outside of Salt Lake City, the 7th BG had fourteen B-17Bs on strength after the transfer of two from Langley. On November 20, the 39th BG was constituted with activation on January 15, 1941. The 7th also assisted in training the 42nd BG, a medium bomber group, during the same time period. After five and a half months of work, the 39th BG moved to Geiger Field, Washington on July 2, taking with them five of the new B-17Cs that had arrived in Utah earlier in the year. Like the 7th BG, the 19th BG was parent to a heavy and a medium bomb group. Activated on January 15, 1941 the 30th BG trained with the 19th BG at March Field using the 21 B-17Bs and five B-17s assigned to the group. The remaining eight B-17s were assigned to the 36th RS. During this period of training the Air Corps suffered its first loss, B-17 s/n 36-157 coming to grief on December 18, 1940. In January the group's 93rd BS flew its B-17Bs across the US to participate in Pres Roosevelt's inauguration ceremony. The 30th BG moved to New Orleans in June 1941, converting to B-24s upon arrival at its new station.<sup>24</sup>

### Production increases with B-17C/D deliveries

In March 1939 Boeing received an order for 38 B-17C aircraft, an improved 'B' model. This order was increased to 80 on April 17, 1940 as war waged in Europe. The B-17C changed the armament of the bomber, replacing the gun blisters on the sides of the rear fuselage with flush,

oval-shaped windows. The belly gun blister was replaced by a larger metal "bathtub" housing carrying a single 0.50-inch machine gun while the dorsal blister located aft of the cockpit was replaced by a flush panel with a socket for a 0.50-inch machine gun. The nose gun mounting was changed from a single socket in the forward window to six sockets mounted in side windows. Self-sealing fuel tanks and armor protection for the crew were introduced and more powerful engines added to the airframe. Deliveries to the Air Corps were made between August and November 1940, but the large number of changes resulted in the last 42 being designated B-17D. Externally, the B-17D differed from the C in having a set of engine cowling flaps to improve the cooling. Internally, the electrical system was revised and a tenth crew member was added. Armament in the dorsal and ventral positions increased from single to paired machine guns, bringing the total armament to one 0.30-inch and six 0.50-inch machine guns. The first B-17D flew on February 3, 1941.

The majority of the B-17Cs went to Britain's Royal Air Force, with one airframe being bailed back to Boeing and seventeen delivering to the Air Corps – fifteen to the 7th BG and two for testing at Wright Field. The Air Corps 'C' models went direct to the Sacramento Air Depot and Wright Field, with the first front line bombers not arriving at Salt Lake City and the 7th BG until February 1941.<sup>25</sup> In preparation for receiving its new charges, the 19th BG released five B-17s and eight B-17Bs to the 29th BG at MacDill Field, Florida in late April 1941. In the interim, a few RAF B-17Cs were loaned to the 19th BG for the purpose of crew training before delivery of B-17Ds. On May 1, 1941 the 7th BG started to release the first of fourteen B-17Bs back to the 2nd BG, the last aircraft transiting back across the US on June 13. The 7th BG received its second tranche of B-17Cs starting in late May, with nine aircraft trickling in over the next two months to join the six deliv-



The odd shape of the Y1B-17 is readily seen in this 1938 photo of a 96th BS aircraft at Langley Field. The tip of the nose contained a rotating turret with a gun mount at top; the entire Perspex nose could rotate 360 degrees. The notch in the lower fuselage behind the turret was for a flat panel for the bombardier's bombsight; the "traditional" B-17 nose appeared with the aircraft redesign for the B-17B. (NARA)

ered earlier in the year. These were joined by five 'D' models during the same time period. By the end of June the 7th BG had six less B-17Cs in inventory, five joining the 39th BG in its move to Geiger Field and one lost in a crash while undergoing rework at Sacramento Air Depot on June 11, 1941.

Starting in early May 1941, B-17Ds were delivered to March Field from the Sacramento Air Depot. Thirteen aircraft were on strength by mid-month, with two more following in the first week of June. On June 1, 1941 the War Department issued orders to move heavy bomb groups away from the coast, with the 19th BG directed to Albuquerque, New Mexico. The air echelon arrived at their new base on June 14. Between late September and early October an additional six B-17C aircraft were assigned to the 19th BG, coming south from the 7th BG in Utah. The 19th maintained at least four B-17Bs on strength and some of the original B-17s appeared to have been left behind at March Field after the move to New Mexico. In August and September the 7th and 19th BG rotated their B-17C/D aircraft through the Sacramento Air Depot at McClellan Field for modification.<sup>26</sup>

Training continued apace at Langley, with the 41st RS directed to parent the 1st and 13th RS, activated on January 15, 1941. The 34th and 43rd BG continued their flying with the 2nd BG providing 150 airmen from already depleted ranks to each new group. Training completed, the 43rd departed for Bangor, Maine on April 18, 1941. The 34th BG soon moved out as well, winging over to their new base at Westover Field, Massachusetts on May 26. At the same time, B-17Bs started to trickle in. The 2nd BG and 41st RS were operating fourteen B-17Bs by mid-June 1941. The Langley bomber pilots quickly reverted to their past, departing Virginia in B-17B #60 on May 13, 1941 enroute to South America (Lima, Peru and La Paz, Bolivia) via Albrook Field, Canal Zone. Unfortunately, this excess of four engine bombers at Langley was not to last.<sup>27</sup> Five B-17Bs were soon shipped out to Westover for 34th BG on



A Y1B-17 parked on a ramp at March Field with a B-10 parked in background. Taken May 4, 1937 this likely depicts one of the first Y1B-17s enroute from Boeing to Langley Field. (NARA)

June 11, cycling through Boeing for upgrades shortly after their arrival in Massachusetts.

Between July and August all remaining 2nd BG airframes were rotated through either Boeing or the Sacramento Air Depot, likely refurbishing aircraft that had flown hard since delivery and performing upgrades such as flush-type side openings for 0.50-inch machine guns introduced on the B-17C to replace blister gun positions. This reduced aircraft inventory at Langley, with participation in the Joint Army-Navy mission at Montauk Point planned for July 15 being scrubbed due to a lack of aircraft availability. A nadir was reached on July 21 when only one B-17B and one B-18 were on the ramp at Langley Field. As aircraft started to trickle back in training resumed in earnest. The group diary noted aircraft flying 12-14 hours daily and National Guard officers being pulled into the training pool and assigned to the group. On August 23, the 41st RS was ordered from Langley to New York Port of Embarkation for transfer to Newfoundland. Taking with it eight B-17Bs, the squadron was tasked with relieving the 21st RS and its B-18s who had been deployed since April 1941 flying patrols off the coast of Newfoundland in search of German U-Boats. The threat of hostilities was starting to come to the fore.<sup>28</sup>

## Overseas

The 5th Group had been in Hawaii since 1919, emerging as a composite group in 1922 before being designated a Bombardment Group in March 1938. Aligned under Hawaii's 18th Wing, the group started to equip with B-18s in 1938. It was soon joined at Hickam Field by the 11th Bombardment Group, activated on February 1, 1940. The 18th Wing was redesignated as a Bombardment Wing on October 19, 1940 with both bomb groups being redesignated from medium to heavy on November 1, 1940.

Joint Exercises in Hawaii in the early and mid-1930s helped define the air power mission. By the time the Army Operating Defense Plans for the Hawaiian Coastal Frontier were issued in 1938, the 18th Wing was an integral



Five B-17Bs gleaming in the California sun at March Field in early May 1940 on the occasion of a 1st Wing Exercise. The second aircraft in line with checkerboard cowlings was assigned to the 88th RS of the 7th BG at Hamilton Field. The 19th BG had received its fifteenth and last B-17B two months prior and was still learning the aircraft and was working hard to prepare for the upcoming First and Third Army Maneuvers later in the summer. (NARA)

part of the joint defense solution. The urgency witnessed in upgrading the Air Corps in the continental US was magnified in Hawaii. Air Corps presence in the islands started to grow in the 1930s with establishment of Hickam Field in 1935. Aircraft soon followed, with the last B-5A Keystone biplane bomber being scrapped in 1937 after new B-12 all-metal bombers arrived the year prior. On January 20, 1938 GHQ AF ordered the 31st Bombardment Squadron and its thirteen B-18s from Hamilton Field, California to the Hawaiian Department. Two months later Boeing P-26A fighters replaced the aging P-12 biplane fighters that provided air defense for the islands, soon followed by P-36s.

In May 1941 the 19th BG was directed to fly twenty one B-17Ds to Hawaii, with the crews remaining in Hawaii to check out 11th BG officers on their new aircraft. The flight from California was unprecedented for the Air Corps and utilized assistance from the Navy, Pan American Airways, and commercial radio stations in San Francisco and Honolulu. Previously bombers had been delivered by ship to Hawaii, the May 1941 flight confirming the concept of hemispheric defense and the ability to rapidly reinforce overseas bases. Once training was complete, the 19th BG crews returned to March Field via ship.<sup>29</sup>

Steps toward cooperation for the defense of the Caribbean between the Army and the Navy started in early 1940. The medium 9th BG shipped to Panama from Mitchel Field in November 1940 and joined the existing 6th BG, providing a potent B-18-equipped strike force for protecting the Panama Canal. Though component bomber

and reconnaissance squadrons were designated as heavy bomber units on November 20, 1940, the groups did not receive four engine bombers in the form of B-24s until 1942. Joint Army and Navy war plans recognized the possibility of enemy action in the region, organizing the Caribbean Defense Command with the Caribbean Air Force in spring 1941 that likely provided the impetus for longer-ranged assets to aid in the defense of the Panama Canal. As part of its dispersal of B-17B aircraft prior to re-equipping with the B-17C/D, the 19th BG flew nine bombers to Panama on June 3, 1941. By August 25 the B-17Bs each were split evenly between the 6th and 9th BGs as one aircraft was totaled on June 20, 1941.

While the US was preparing for war overseas there were changes at home as well. The GHQ AF defense plans for the Continental US in March 1941 saw the force fractured between four numbered air forces (First through Fourth Air Forces) which were aligned under the First through Fourth Armies.<sup>30</sup> The Air Corps became the United States Army Air Forces (USAAF) on June 20, 1941 and five days later GHQ AF was re-designated Air Force Combat Command. The wartime structure of air power was now in place.<sup>31</sup>

### The End ... and the Beginning

On September 1, 1941 the 19th BG was alerted to move to the Philippines. B-17Cs assigned to the 7th BG were still undergoing conversion to 'D' standard at Boeing before moving to the 19th BG, so the 18th Bomb Wing



A 19th BG, 32nd BS B-17B parked at Biggs Field, Texas in April 1941. The bomber was likely on a cross-country training flight from March Field. The 21 B-17Bs and five B-17s assigned to March Field at the time were being used to train 19th BG crews as well as the expansion 30th BG. (NARA)

pulled together personnel and nine B-17D aircraft from the 5th and 11th Bomb Groups and created a Provisional Squadron. The nine B-17s departed Hawaii on September 5, with the 19th BG departing California for the Philippines starting October 16.<sup>32</sup>

On September 5, 1941 the 1st through 4th Bomber Commands were activated and assigned to First through Fourth Air Forces. Existing CONUS-based bomber units were aligned under these new commands.<sup>33</sup> The 7th BG was alerted to deploy to the Philippines in November as Washington made the decision to go all in with equipping the Far East Air Force with all 'modernized' B-17s and aircraft and personnel started their westward movement. December 7 (December 8 in the Philippines) witnessed large

scale destruction of the overseas B-17D fleet of the 5th, 11th and 19th Bomb Groups. The following day the 2nd BG started wartime patrols off the Atlantic Coast with its remaining B-17s and B-17Bs as the B-17D started to fly its first American combat missions in the Pacific. It was going to be a long war for the Flying Fortress.

The B-17E was ordered on August 30, 1940 with the first prototype taking to the air on September 5, 1941. With the 'E' model the B-17 had undergone a major redesign, most noticeable being a new tail with an integrated gun turret and dorsal and ventral gun turrets. An aircraft built for war, it marked the end of the experimental stage for the Air Corps – now the Army Air Forces. The strategic bomber was an accepted component of America's military. ■



The 19th BG at March Field did not start receiving its B-17Ds until May 1941. In the interim, it continued to operate B-17Bs as well as B-17s. A few RAF B-17Cs were loaned to the 19th BG for the purpose of crew training before delivery of B-17D. This photo, dated March 28, 1941 likely depicts one of those RAF bombers wearing a simple USAAC olive drab paint scheme. By mid-May thirteen B-17Ds were assigned to the 19th BG with two more following in the first week of June. On June 1, 1941 the War Department issued orders to move the 19th BG to Albuquerque, New Mexico. (NARA)

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# THE AIRMEN OF THE GREAT WAR: FOUNDERS OF MILITARY AVIATION CULTURE



A French SPAD S.XVI two-seat biplane reconnaissance aircraft, flying over Compiègne Sector, France circa 1918. Note the zig-zag patterns of defensive trenches in the fields below. (Courtesy San Diego Air and Space Museum Archive.)

Alexander Buschor

With the introduction of large-scale aerial warfare during World War One, a lack of established traditions, rules, and regulations enabled airmen to develop a new culture and style of fighting, leading to lasting effects on military policy and aerial warfare tactics. Examining the backgrounds and selection of the airmen of the First World War, as well as the culture they developed, helps to illustrate the influence of the air services and aerial tactics used on future policy both throughout the war and into modern times.

The First World War is known for having implemented several new types of weapons and styles of warfare—creating a total, truly modern war. Rapid firing artillery and machine guns brought a previously unimaginable level of carnage to the traditional battlefield, and the introduction of the submarine rattled the foundations of centuries of naval doctrine. However, these new weapons were merely additions to already existing theories of land and naval warfare. Armies and navies throughout the world had centuries of tradition and culture to fall back on, and this was what, in part, allowed the men of World War I to persevere through even the darkest days of the conflict. However, the introduction of the airplane brought about an entirely new battlefield—one with no culture, tradition, or heritage.

At the outbreak of the Great War, general aviation was still new to the world. The application of flying machines to military use was still in its infancy and viewed skeptically by legacy strategists. Although airships had already existed since the late nineteenth century, powered flight was not established until 1901. Over the next thirteen years, the reliability of aircraft would gradually increase, and their potential usage would expand immensely. Early visionaries such as Italian General Giulio Douhet envisioned waves of bomber aircraft attacking enemy cities and centers of industry, bringing foes to their knees without ever having to use ground forces. This idea was occasionally sensationalized by the media of the day, and it terrified the public. The new concept of aerial warfare was so rattling that the Hague Conference of 1899 brought it to the Western world's attention well before Douhet had cemented his vision of aerial dominance—and it was forbidden.<sup>1</sup>

The technology of early twentieth-century aviation would not allow a scale of air combat as grand as Douhet's vision. For example, during the Great War, the German military launched a total of 24 air raids and three Zeppelin raids on the city of Paris. Over 700 bombs were dropped, killing only 266 Parisians.<sup>2</sup> The planes of the era were too small, delicate, dangerous, and expensive to do any significant damage. However, it was because of this expense and danger—especially during the prewar era—that early aviation was associated with aristocratic sportsmen. Flying was considered daring, with only the courageous—and those who could afford it—actually doing it. As early as 1914, a French aviator stated, "Military aviation is apparently the most dangerous sport man has discovered since the contests of the gladiators."<sup>3</sup> This



Aviation pioneer and theorist, Italian General Giulio Douhet.

viewpoint was common among aviation enthusiasts and the general public of the day.

Due to such factors as technological limitations, funding, and weather, the air battles of the Great War were relatively separate from the war on the ground.<sup>4</sup> Although most modes of warfare were ultimately utilized to support the common foot soldier, this perceived isolation of the air war has some truth to it; however, it was exacerbated by the media of the day, the physical separation of the airmen from the ground forces they were supporting, and the newly formed culture of military aviation by the airmen themselves. The best way to understand this divide and subsequent cultural formation is to begin with the makeup of the aviation cadres, as well as the selection of the aviators.

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Since the concept of military aviation was so new, and few men were qualified to fill the required roles, those who already had flying experience—mostly sportsmen and wealthy private citizens—immediately became valuable. In *The Oxford Illustrated History of the First World War*, John H. Morrow, Jr. perfectly delineates the role of the pre-war aviator:<sup>5</sup>

*Ironically the coming of war would catapult the pre-war sport aviator's small, speedy, and manoeuvrable aeroplane, now armed, back into the forefront of public imagination, as the vehicle of the war's greatest individual heroes, the air aces, the heirs of pre-war daredevil sport aviators. Wartime air combat would reintroduce aspects of sport aviation that the pre-war military had sought to eradicate—the emphasis on individual exploits and the high performance aeroplane occasionally dangerous even to its own pilots.*

Although prewar aviators filled large gaps in the early cadres of airmen, a massive recruitment and training process needed to occur. All the primary belligerents of the Great War had their own ways of doing so, and several similarities can be drawn between them.

Early in the conflict, most nations called upon their current cadre of military officers. However, the question remained as to what types of officers would be best suited for flying. The Germans and French initially recruited heavily from the cavalry, as some believed that horse-riding skills would simply carry over into flying an airplane.<sup>6</sup> Regarding a cavalry or infantry officer transferring to air service, Lee Kennett, author of *The First Air War, 1914-1918*, stated, "Usually the soldier's commanding officer had to give his consent to the transfer, and that consent was more easily obtained by a malingerer, or troublemaker, rather than by a dutiful soldier."<sup>7</sup> This "troublemaker" mentality, like the attitudes of prewar sportsmen, would go on to have a substantial impact on the shaping of aviation culture.

As mentioned earlier, the existing military officers of the time would not be sufficient to meet the manning requirements as the air war escalated. As a result, governments began to heavily bolster their civilian recruitment processes. Although special requirements were established, most governments enjoyed emphasizing the fact that average citizens could become airmen. Kennett articulated such a point when he claimed, "Whatever the impact of the selection process, it seems to have placed little emphasis on a candidate's cultural background or social standing."<sup>8</sup> British wartime newspaper *The Lancet* even went as far as to publish: "Flying is not now confined to the public school boy, the cavalry officer, or the athlete. We take many of our pilots at present from the lower middle classes and the artisan class."<sup>9</sup>

However, Kennett would later state that although governments liked to highlight the openness of their air arms, the "public school boy" and educated upper-class social groups typically set the tone for air service recruitment and squadron life in general, particularly in the Royal Flying Corps.<sup>10</sup> A strong similarity can be seen in the first American airmen to see combat in the Lafayette Escadrille, a



William Thaw II and Whiskey, mascot of the Lafayette Escadrille. Paul Pavelka is in the background.

French squadron composed of American volunteers. The first batch of Escadrille airmen consisted of two Harvard graduates, one New York lawyer, and a physician. However, sportsmen such as William Thaw and Bert Hall, the latter of whom was a professional soldier of fortune, were still represented.<sup>11</sup>

Upper-class representation continued in some of the first U.S. naval aviation units to deploy overseas. The First Yale Unit was a flying club for students at Yale University who had attained status as a naval reserve unit.<sup>12</sup> When the U.S. finally entered the war in 1917, a personal connection with the Secretary of the Navy enabled the unit to become activated as an official Navy squadron.<sup>13</sup> Ivy league students in the flying club simply put down their pencils, received commissions as naval officers, and deployed overseas for the war. Another organization, the First Princeton Unit, followed the same example. Students would spend their summers training with the Royal Flying Corps in Canada<sup>14</sup> and, upon graduation, deploy to the English or French coastlines. These “public school boy” and upper-class temperaments would later have certain effects on how the air war was waged.

In addition to pedigree, there appeared to be a commonality of personality types associated with individuals who harbored a proclivity for flying. In *On Killing*, Lt. Col. Dave Grossman (retired) speaks about the concept of becoming addicted to combat. On aviators, he states, “Fighter pilots, by their nature, and due to the long range of their kills, appear to be particularly susceptible to such killing addiction.”<sup>15</sup> He also notes that after World War II, senior U.S. Air Force personnel attempted to find commonality in the backgrounds of their fighter pilot cadres. A common denominator was many schoolyard fights. Grossman goes on to specify the difference between a bully and someone with a fighting spirit, placing fighter pilots solidly in the latter category.<sup>16</sup>



Personnel of the First Yale Unit of the United States Navy Air Reserve during aviation training in West Palm Beach, Florida, ca. 1915-19. (Photographic print, F. Trubee Davison papers, 1882-1961 (inclusive). Manuscripts & Archives, Yale University Library.)

Recruitment of civilians continued as the war intensified, and the selection and training they received had several effects on the atmosphere that would develop in aviation life at the front. The French military was the first in Europe to specify a special license for military personnel to fly, which had more requirements than civilian certification. Most European militaries also precluded married men from the air service. It was clear that all combat-oriented military service was dangerous, but no such marital restrictions were placed on any other branch of the military.<sup>17</sup>

When training began, there was little standardization. Air Vice-Marshal Arthur Gould Lee recounts his early years in flight training during World War I in his book *Open Cockpit*: “There was no instruction technique, no standard method. Nobody could explain in simple, practical terms how a plane was piloted.”<sup>18</sup> Lee also notes that at the beginning of the war, the RFC was only taking civilian applicants who already had a pilot’s license, something that was expensive to attain.

The French went as far as to close all their flight training facilities at the outbreak of war, since all the instructors were now required for frontline duty. When attrition mounted, however, this quickly became unsustainable, and the schools were hastily reopened. To accurately highlight the poor level of training that was being administered, one only has to look at the Lafayette Escadrille airmen, who, upon America’s entry into the war, were folded into the U.S. Army Air Service. Regardless of all these men having already had extensive air combat experience—some of them were even aces—they were required to take the U.S. Army’s flight examination, and they all failed.<sup>19</sup> Regardless of what type of instruction was given and who was giving it, military aviation was dangerous. Kennett accurately sums up the end result when he states:<sup>20</sup>

*It is probable that well before 1914 this sort of winnowing-out, added to the special requirements for airmen, had already produced a body of specialists who were quite distinct from the rest of the military establishment. They were young... they were unattached; they were not repelled by the risks involved, and most of all they were captivated by the*



Luxeuil-les-Bains, May 1916. (L. to R.) James McConnell, Kiffen Rockwell, Georges Thénault, Norman Prince, and Victor Chapman. A tragic photo, all four Americans would die within the next few months.

*idea of flying. Well before 1914 the rest of the army regarded the airmen as a reckless, rambunctious breed.*

When newly winged airmen finally joined their squadrons at the front, Kennett's point about the rest of the army regarding them differently became immediately apparent, and this obvious distinction was what made the formation of new military cultures, tactics, and policies so easy. This contrast was acutely noted by Hubert Freeling Griffith, a British army officer who had transferred to the RFC, when he said, "My feeling was that I was being invited to a party after quitting the gates of a penitentiary."<sup>21</sup> An American army chaplain also noted, "The average American aviator at the front regards life in a lighter vein than any other man in the service of Uncle Sam."<sup>22</sup>

One of the primary reasons for this stark polarity was the relative isolation of airmen at the front. The true frontlines buttressed no man's land, were filled with mud, and were within range of constant artillery bombardment from the enemy. Aerodromes were typically set 15–20 miles behind the frontlines, where they were safe from artillery and ground attacks. This physical distance excluded airmen from virtually all the harsh realities of trench life. Even sleeping in converted barns was better than the trench.

The stalemate at the front also contributed to the distinct nature of the airmen. In *Cowardice: A Brief History*, Chris Walsh states, "Well into the nineteenth century, battles were measured in hours or days. By 1916 they often stretched for months."<sup>23</sup> In a war fought with new and advanced weaponry, all built to bring conflict to an end as speedily as possible, a protracted conflict was not anticipated.<sup>24</sup> However, for the airmen, this meant that the airfields did not need to pack up and move; thus, nicer amenities could be brought in without the fear of having to leave things behind.

Typically, there were only one or two squadrons at each airfield. This was by design so that they could cover more of the front. This meant that a typical squadron flyer was usually isolated from his wing commander. Conversely, in the infantry, every foot soldier knew and lived in close prox-



Gervais Raoul Lufbery

imity to his commanding officer. In *Open Cockpit*, Lee speaks of a new wing commander coming to review his airfield; he had no idea who he was, nor did he know the identity of the previous commander.<sup>25</sup>

This isolation from leadership, in combination with the harshness of the front, allowed a lackadaisical attitude to develop among soldiers when not directly involved in combat. Officers and enlisted men would talk casually with one another, something unthinkable in a cavalry regiment.<sup>26</sup> Whereas bad weather meant misery for troops in the trenches, for the airmen, it meant they did not have to fly. They spent their downtime in their quarters drinking, playing games, and writing letters home.

Due to their lightheartedness, airmen typically dressed outside of regulation garb. This had a practical aspect to it when flying—for instance, it allowed them to counter the cold weather at high altitudes—but on the ground, it became an aesthetic representation of flying. Non-standard boots and jackets were common. Some airmen would even take grease from the engines and slick their hair back "fighter pilot style," something that would never have been tolerated in an infantry unit. This casual attitude would often go airborne. One German bomber squadron used to take a dog with them on missions; they even had a logbook for it. Occasionally, the body of a shot-down airman would be found in pajamas or tennis attire.<sup>27</sup> To show their pride, airmen would paint insignia or loud and colorful designs on their aircraft. All this chafed with traditional army brass. However, whereas such behavior would have been immediately halted in the infantry, it was typically allowed to continue in the air service.



Frank Luke poses for a photo in front of an aircraft he recently downed, his 13th kill. Few soldiers would pose in front of a recently shot foe; the mechanical nature of air-to-air combat, however, substantially changed the attitudes of killing.

In the earlier days of the Great War, airmen would frequently venture out on their own in search of the enemy. This behavior displayed the daredevil mentality so frequently associated with flying at the time. Commonly referred to as “lone wolfing,” airmen would go aloft to seek vengeance for a fallen squadron mate or increase their kill score. American pilot Frank Luke, a college graduate who sought adventure in the air service, was notorious for often going aloft alone in search of prey. He would frequently attack heavily defended observation balloons alone, disregarding orders from his commanding officer not to do so. Luke continued this behavior until it killed him, losing his life to ground fire after attacking an enemy observation balloon; Luke Air Force Base was named in his honor. French-American airman Raoul Lufbery had a similar attitude; he manned an airplane to give chase to a German aircraft flying close to his aerodrome and was killed in the process.

Despite the aggression of World War I airmen, there was a surprisingly significant amount of civility between the moments of belligerence in the skies. Due to the largely tempered nature of the middle- and upper-class members of the squadrons, many airmen gave ample respect to their enemies.

One man who championed civility in aerial warfare was Manfred von Richthofen, known as “The Red Baron.” Like so many early war aviators, von Richthofen was a cavalry officer whose duties became somewhat negligible with the advent of trench warfare. After transferring to the air service, he quickly distinguished himself as one of the most lethal warriors in the air. Though it may be a surprise to some, after a century of monstrous portrayals of German military aggression in media and popular culture in general, von Richthofen encouraged the men under his command to never attack an airman who was already on the ground or to withdraw from a pursuit against an enemy who had run out of ammunition.<sup>28</sup> The Red Baron regarded



Capt. Eddie Rickenbacker and the mechanics assigned to his Spad XIII.

aerial warfare as a sort of sport—a similarity to the style of riding that horsemen were already so familiar with. Just like sportsmen collected the antlers of animals they killed for display, the Red Baron acquired war trophies of enemy aircraft his unit shot down over their own lines. When von Richthofen was ultimately shot down by his enemy, they gave him a full military burial, complete with honors and wreaths sent from allied squadrons to pay their respects.<sup>29</sup>

When an airman was shot down in combat, his adversaries would occasionally provide notice to his home unit, informing them of whether he had been killed in action or taken prisoner. There were even instances when a volunteer would fly over their adversaries’ aerodrome and drop the personal effects of an enemy killed in action.<sup>30</sup> Such respect for the enemy was even given during actual combat. Kennett says, “Italian pilots, seeing an enemy falling to his doom, sometimes saluted him with the phrase: You today, me tomorrow.”<sup>31</sup>

Although he was nowhere near as successful, the American version of the Red Baron was Eddie Rickenbacker, America’s top ace in the war. Rickenbacker was a race car driver prior to the war and, through perseverance and cunning, became a lethal air warrior. In *Five Down and Glory*, Gene Gurney explains Rickenbacker’s attitude toward the enemy in combat when he states, “He tried to make combat a sporting proposition, resolving ‘never to shoot at a Hun who is at a disadvantage, regardless of what he would do if he were in my position.’”<sup>32</sup> Gurney best sums up the tone of early war air combat when he describes:<sup>33</sup>

*Back and forth across no man’s land the planes darted, gathering intelligence and spotting for the artillery. It was a gay and exciting game for the pilots, who, freed from the earth and the ugliness of war, felt a common bond with the fellow airmen of the enemy nations. War was fun; military flying an adventurous sport. The aviators on both sides would often, when passing each other hurrying to and fro over the battlefields, wave and shout greetings.*

The press had a significant effect on the airmen of the Great War, as well as the public’s perception of them. Im-



Nieuport 28s of the 95th Aero Squadron warming up.

mediately, journalists typically treated the air war as an entirely separate conflict from what was occurring on the ground and high seas, and this had a significant impact on soldiers' and sailors' opinions of the airmen as well.<sup>34</sup>

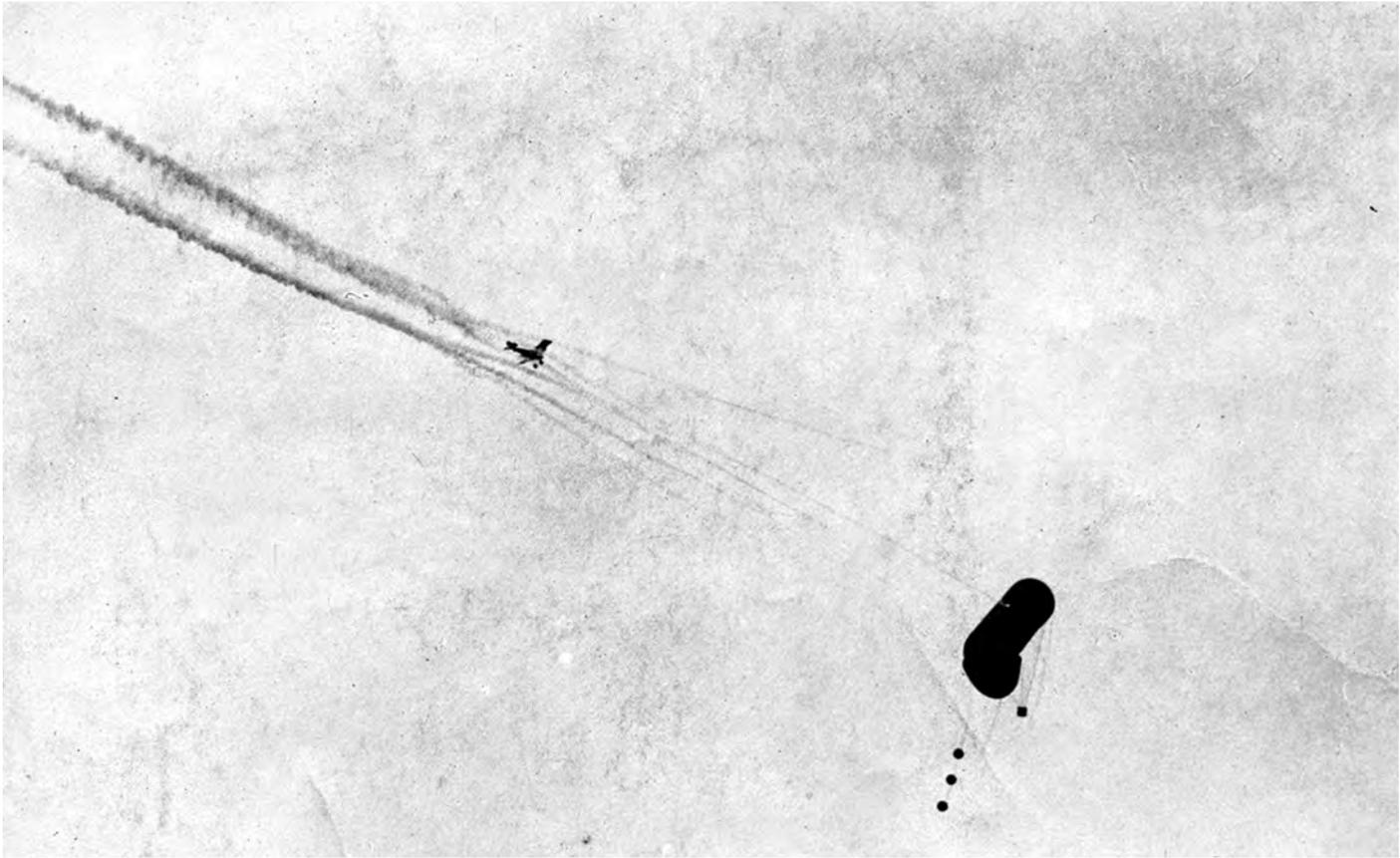
Aerial combat was considered more chivalrous than modern ground fighting; this was due to several factors. The land war introduced carnage at a level unseen in previous European wars. This had the ramification of draining any romantic ideals of traditional combat. No longer was there glory to be had from leading a cavalry charge; rapid firing artillery and machine guns would cut such tactics down in seconds. At the start of the war in 1914, officers were expected to stand at the front of their men and walk them forward into battle. French officers actually went into battle in 1914 wearing hats and white gloves. After an appalling rate of junior officer casualties,<sup>35</sup> this practice, and the romanticism that came with it, quickly vanished. Total war made the contribution of an individual almost insignificant. The airmen, however, could still lead formations into battle—only now, it was aircraft instead of horses. The individual skill of a pilot, especially at the beginning of the war, still had a significant impact on the outcome of an engagement. The press pounced on this last remaining vestige of romanticism in combat and championed it; as a result, airmen were portrayed as knightly figures. Although several aviators disliked this portrayal, the average foot soldier in the trenches likely loathed the glory that the airmen seemed to hog.<sup>36</sup>

The press's focus on the air war had significant results on the home front. Citizens of nations engaged in the war now had heroes to look up to. So enticing was the idea of aerial warfare to the public that French aeronautical societies began the practice of awarding cash prizes to airmen that scored an air-to-air kill.<sup>37</sup> Although this practice was discouraged and quickly made illegal, it shed light on the general public's pride in their aerial heroes.

Like the press, the governments of belligerent nations sought to highlight the exploits of their airmen: "The German army, playing upon chauvinistic notions of cultural supremacy to bolster military aviation, effectively controlled civilian aviation through its pervasive influence on German society."<sup>38</sup> Morrow continues to detail the significance of early military aviation in German society, stating, "Flight thus assumed nationalist, imperialist, and militarist characteristics by 1914."<sup>39</sup>

Morrow also goes into the specifics of the romanticization of aerial warfare as well as the class origins of the airmen themselves: "The romanticizing of the exploits of this new warrior elite enabled an extension of nation's myths into the warfare of the industrial era, in which the new military elite came primarily from the middle class."<sup>40</sup> Although the press went to great lengths to portray airmen as knights, and some early airmen championed the idea of "lone wolfing," these perceptions gradually faded as the industrial nature and carnage of the ground war caught up to the air war. Morrow states, "British and German fighter pilots might acknowledge the notion of being a new military aristocracy. Yet British fighter pilots combined this with a faith in teamwork derived from the public schoolboy's perception of aerial combat as a team sport, while the Germans, many of whom were professional soldiers, believed in discipline."<sup>41</sup>

This winnowing out of the knightly lone aviator image and shifting of the aviation culture in general paralleled the implementation of new aerial strategy and tactics. Although the overall purpose of air combat over the battlefield was to tip the balance of the stalemate below, the strategy and tactics utilized to accomplish this were devised largely by the airmen themselves, as opposed to planners working in headquarters or a shockingly small number of decision makers actually bringing nations to war with one another.<sup>42</sup>



A German balloon being shot down. (National World War I Museum, Kansas City, Missouri, USA).

Raoul Lufbery, the first commanding officer of the Lafayette Escadrille, invented a plethora of aviation firsts, many of which are still used today. To gain the upper hand over his adversaries, Lufbery perfected reversements. For defensive operations, he created what became known as the Lufbery Circle, where planes would fly in a wide circle to provide mutual support for any enemy aircraft that tried to chase a plane in the rotation. When aerodromes were first established behind the lines, aircraft would take off and land in any direction they chose until Lufbery created a landing pattern around the field, which is still used worldwide today.<sup>43-44</sup> Many other aerial maneuvers are named after their creators, such as the “Immelman,” a reversal maneuver championed by German aviator Max Immelman.

Just as strategy and tactics went from lone airmen to group efforts as the war became more industrialized, so too did the knightly viewpoint on air combat in general. Early aviators typically did not wear parachutes when they flew into combat. Many airmen considered the idea of wearing a parachute to be “sissy,”<sup>45</sup> while the British Royal Flying Corps thought parachutes would provoke their airmen to unnecessarily ditch an aircraft rather than stay in the fight. As the war dragged on and casualties mounted, the use of parachutes became much more acceptable to the airmen.

The rules and regulations pertaining to the air service were also influenced by aviation culture and the dynamic style of combat seen in the sky. Due to the publicity associated with early aerial victories, an obsession with kill

scores grew among the airmen’s ranks. To curb or at least organize this fixation, the French military’s air service developed the “ace” system. Never before had a nation’s military made such an official effort in the development of recognition outside of the rank structure or in the issuance of medals. To become an ace, an airman needed five aerial victories (blimps included).<sup>46</sup> The French ace system stipulated that a French airman needed to down an enemy plane over French lines so that the kill could be confirmed by ground forces. What French policymakers quickly discovered was that French airmen stopped flying over enemy lines and would rather wait for the Germans to fly into French territory so that they could get the kill credit. Rather than order a stop to such counterproductive behavior, the French military bent the rules to allow for a kill credit to be obtained over enemy lines.<sup>47</sup> Kennett states, “The spread of the ace system, and the preoccupation with ‘scoring,’ no doubt had an effect on the nature and tempo of the air war.”<sup>48</sup>

Outside of the ace system, other military regulations were often ignored by the airmen, and leadership frequently looked the other way. As stated earlier, aviators were allowed to customize their aircraft with varied colors and wild designs. They were also allowed to choose individual logos for their aircraft, something that was typically only allowed for large ground units or flag-level officers in command of land and sea forces.

The rank of the airmen was also something that received official military policy. Although there were a significant number of enlisted airmen during the Great War, the



The American flag flies over Spad VII's of the Lafayette Escadrille.

majority were commissioned officers. As the war continued, these individuals were typically relegated to gunnery roles and ground attack missions. Since it received so much of the public's attention, air-to-air combat was flown almost exclusively by officers.<sup>49</sup>

After the military leaders of belligerent nations recognized the importance of military aviation—and, more importantly, its stark differences from land and sea combat—movements arose to make entirely new branches of the military for aviation. The Royal Flying Corps of the British Army became its own branch, the Royal Air Force, as early as 1918.<sup>50</sup> Other nations followed this example. The U.S., however, would not officially do this until 1947.

With the invention of powered flight in 1903, the perception of early civil aviation as a sport, and the advent of military aviation, a novel and unique culture was formed in early military aviation. This culture was greatly influenced by the vanguard airmen of the First World War—specifically, their backgrounds, training, and the combat they experienced. Due to a lack of tradition in the brand-new world of military aviation, the introduction of this new culture significantly influenced the strategy and tactics of aerial warfare, as well as various military rules and regulations pertaining to air services. Several aspects of World War One military aviation culture, tradition, tactics, and regulation continue to be in practice to this day. ■

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# STEEL BEGETS STEEL: THE WORLD WAR II TUNISIAN CAMPAIGN THROUGH THE EYES OF A B-25 PILOT



John “Garick” Chamberlin

B-25 pilot Lt Charles Lockhart and his navigator in front of the Sphinx. (All photos courtesy of the Lockhart family.)

## A Comic Book Printer Goes to War

In late 1941, before the United States officially entered World War II, but after the draft had begun and as the military was expanding rapidly, Remington-Morse Publications, a company best known for comic books, hit upon a topical new product. In November 1941, ads began appearing for the perfect present for “the boy in camp” – a diary customized for military members entitled “My Life in the Service.” The journal, with military emblems printed on the inside cover and instructions for what makes a good war journal, along with spots to record such information as promotions, gifts received, service-buddy contact information, and, of course, lined diary pages with inspiring quotes at the bottom of each, sold like proverbial hotcakes. Although many service members abandoned their journals after a few entries, others became noted diarists. B-24 pilot, and later Senator and presidential candidate, George McGovern’s copy, for example, became the basis for an entire book. In early 1943, an unknown benefactor’s gift of the blank journal arrived for First Lieutenant Charles “Charley” Locklear Lockhart, a B-25 copilot assigned to the 12th Bombardment Group (Medium) in North Africa. Charley was never known to keep a journal before this gift arrived, and never returned to the habit once he filled all but the back of the final page. From February 12 through April 24, 1943, however, he wrote almost daily, offering an amazing opportunity to observe the Tunisian campaign from shortly after the American reversal at Kasserine Pass until just before the Axis surrender in North Africa.<sup>1</sup>

Lt Lockhart immediately customized his journal, drawing a pictograph of his last name (a padlock in the shape of a heart) over the Pilot’s Badge and proudly inscribing “Permanent” on the “1st Lieut.” bar on the insignia page inside the front cover. As well as his journal entries, he wrote comments about the patriotic quotes printed on the pages, though this became less common as his enthusiasm faded over the long campaign. His response to the proverb “confidence begets confidence,” for example, was to write beneath it “steel begets steel.” Lt Lockhart’s phrase evokes his time in North Africa so aptly that it became the title of this essay. While these comments offer insights into Charley’s mindset, it is his record of his daily experiences in the 1943 Tunisian Campaign that particularly enriches our understanding of the period. Lt Lockhart’s entries, focused on tactical and individual issues, reflect themes discussed in most sources at the command level: the integration of British and United States Air Forces, the Northwest African (Operation Torch) side of the campaign’s post-Kasserine switch from defensive to offensive counter-air operations, and the challenge of attacking a closing ring of Axis forces as they consolidated such assets as Anti-Aircraft Artillery (“flak”) into an ever smaller area. Although these insights do not overturn current scholarship, they show the North African Campaign from a remarkably personal level that memoranda from commanding generals rarely capture.<sup>2</sup>



An undated portrait of Charley Lockhart taken during or just after his pilot training late 1941 or early 1942.

### Before the Journal

Charles “Charley” Lockhart was seemingly destined to be a military flier. Born in Stephenville, Texas, in August of 1920, Charley was the son of a World War I veteran, and his paternal grandfather had fought in the Civil War. His parents gave him the middle name Locklear in honor of the famous daredevil flyer Ormer Locklear, who had died filming a stunt earlier in the month, and whose widow lived in nearby Fort Worth. Charley continued to epitomize the future pilot archetype as a student at the local John Tarleton Agricultural College (now Tarleton State University). There, despite his slight frame, he quarterbacked the Tarleton Ploughboy football team, as well as reaching Lieutenant Colonel in the college cadet corps and completing preliminary flight training. He also met and wooed coed Pauline Craft, whom he nicknamed “Cheezie,” in honor of her last name.<sup>3</sup>

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With American entry into World War II looking increasingly likely, Charley left school in 1941 to join the Army Air Corps. He began his training in Hemet, California in November 1941, just weeks before the Pearl Harbor attack. Shortly thereafter, he progressed to advanced twin-engine pilot training a few dozen miles north at the new Victorville Army Flying School (later George Air Force Base), where he was part of the school’s second graduating class in May 1942 and earned a commission as a Reserve Second Lieutenant. From there he transitioned to Columbia Army Air Base, South Carolina for B-25 upgrade training and was assigned to the 12th Bombardment Group (Medium) at Esler Field, Louisiana, on July 2, 1942.<sup>4</sup>

Lt Lockhart arrived to find his new unit madly preparing for departure to an undisclosed location. Though the details remained classified, the fact that all of their B-25 *Mitchells* had been painted in a “desert pink” camouflage scheme made the general area obvious. Rommel’s 1942 offensive had pushed British forces from El Agheila in North-Central Libya all the way to El Alamein, Egypt, just 66 miles from Alexandria, where the battle that would finally blunt the advance had just begun. The British needed support as soon as possible, and the incredible logistic undertaking of Operation Torch, which would open a second front west of Axis positions in North Africa, would take months to come together. Therefore, on July 16, the 12th Bomb Group (along with a B-24 bomb group and a P-40 escort fighter group) put their ground support personnel on a former French passenger liner and flew their bombers across the Atlantic and Africa to Egypt. Lt Lockhart’s 82nd Bombardment Squadron, as well as the 81st, arrived at Deversoir, near the Suez Canal, in early August, while the group’s other two squadrons, the 83rd and 434th, were stationed at nearby Ismaila. There, they integrated with the Royal Air Force units supporting General Montgomery’s 8th Army.

Though they had arrived too late for the first Battle of El Alamein, they gained valuable combat experience in the stalemate that followed. The B-25s originally flew night missions as part of a mixed package alongside RAF *Wellington* and *Halifax* bombers, but the *Mitchell’s* lack of flame dampers on their engine exhaust made them easy targets at night. Until this could be rectified, the RAF switched the B-25s to daylight bombing, joining light *Baltimore* and *Bostons* in close support missions. Lt Lockhart and the 12th Bomb Group learned RAF tactics, such as “Tedder pattern bombing” that targeted an area of dispersed armor and troops. During Rommel’s attempt to continue his stalled offensive by attacking the southern flank of the British lines at Alam al-Halfa (August 30-September 5, 1942), the combined Western Desert Air Force sent formations of 12 or 15 South African *Bostons* with three or six American *Mitchells* to the battlefield in multiple sorties a day. Germans took to referring to these formations as “the obstinate eighteen” (*die sture Achtzehn*), and, given the massively larger bomb load of the B-25s, they became known as the “Earthquakers.” The 12th Bomb Group proudly adopted this nickname, using it in letters and painting it on their ground equipment for identification.<sup>5</sup>



Crew in Belem, Brazil on July 24, 1942 during the 12th Bomb Group's deployment to Africa. They stopped there overnight after an eight-hour leg from Trinidad.

By October 9, the 12th was once again joining RAF formations in bombing Axis landing grounds near El Daba and Fuka. The Western Desert Air Force had the advantage of paved airfields near the canal, while Axis landing grounds were simple hard-packed desert that performed well when dry, but turned to mud whenever rains came. This issue would later reverse itself when Allied forces advanced. During these raids, Lt Lockhart and his companions once again used British tactics. They targeted dispersed aircraft via pattern bombing from 10,000 feet, rather than risking lower-level precision attacks on runways that would not require repair even if cut, as one patch of desert was much like another. These missions helped secure air superiority for the 8th Army when General Montgomery went back on the offensive, beginning with the second Battle of El Alamein (October 23-November 11). Concurrently, Allied Operation Torch landings in Morocco and Algiers opened a second front for the Axis, sending Rommel into a fast retreat to consolidate in Tunisia.<sup>6</sup>

As Rommel retreated, the bombers advanced to keep the enemy in range. In November 1942, much of the 12th was operating out of Landing Ground 88, near Alexandria Egypt, a station previously used only for fueling and arming near the front. Just weeks later, they were flying out of Landing Ground 142, near Tobruk, Libya, and Charley had been promoted to First Lieutenant, US Army Air Corps. This promotion meant a lot to him, as it was neither a Reserve commission, as he'd originally received, nor a temporary rank, as so many wartime promotions were, thus prompting the notation of "Permanent" on the insignia in his journal. On January 2, 1943, 1st Lt Lockhart's crew lost their primary aircraft (the "Pair-o-Dice") when another squadron used it in an ill-fated cross-Mediterranean raid on Crete. A sandstorm blew through as the mission was beginning, limiting visibility and clogging engine filters. Only twelve of the planned 36 aircraft managed to take off for the raid, and, running low on fuel on the return trip, only one managed to return directly to LG 142. Several landed at random locations and managed to return to base after acquiring fuel, but two, including the Pair-o-Dice,

ditched in the sea. Though the RAF Sea Rescue saved the crews, the aircraft sank to the bottom of the Mediterranean. Charley wrote a letter to his crew chief's mother praising his work keeping the plane flying so long and reporting the loss with the comment, "she was a good ship, and had filled her mission."<sup>7</sup>

Later that month, elements of the 12th had already advanced most of the way across Libya and were flying from Tmed El Chel Airfield, south of Tripoli. It is from here that the first mission reports including full crew lists are found in the archives. Lt Charles Lockhart is listed as Lt Clinton Kirkpatrick's copilot on night missions to bomb landing grounds and airfields around Tripoli on January 19, 21, and 23, including the main Luftwaffe base of Castel Benito. Apparently the new flame dampers worked well. By February 13, the Allies had seized Castel Benito and the Afrika Korps had retreated to the fortified Mareth Line in Tunisia.<sup>8</sup>

Things were not proceeding so well on the Western Front. Though the troops of Operation Torch mostly avoided combat with Vichy French troops, most of whom abandoned the Axis and joined the Allies as the "Free French," they failed to seize Tunis before it could be reinforced. The famed "Run for Tunis" had come to an abrupt end in late November 1942, when Axis forces counterattacked at Djedeida, just 40 miles east of the capital, and pushed Allied forces southwest to Medjez el Bab by December 10. General Eisenhower credited local Axis air superiority as their greatest advantage. Hard-surfaced runways near Tunis and Bizerte gave the Axis reliable fields both for receiving reinforcements and for sorties over the front, whereas allied planes were often mired at advanced landing grounds as the winter rains began or flying from hard-surfaced runways over 100 miles away from the front. As the front lines stabilized throughout the winter, Allied commanders took advantage of the lull to reorganize the inefficient air command structure in North Africa. This including splitting the 12th Bomb Group, with two squadrons staying in Libya attached to what would now be the 9th Air Force, and two joining the Torch forces in Algeria. Although some sources cite the disaster of the Battle of Kasserine Pass (February 19-26, 1943) as the impetus for this decision, it was actually planned at the January 1943 Casablanca (aka "Anfa") Conference and took effect before Kasserine Pass took place.<sup>9</sup>

General Eisenhower had noted the success of the integrated air forces under Montgomery and the inefficient use of airpower in the Torch theater, in which British and American air elements had separate chains of command. In fact, he considered his acceptance of arguments that "a unified Command would be impracticable" one of his chief errors of the campaign. With the consolidation of North African combat operations into a mutually supportable area of Tunisia, he saw an opportunity to rectify that error. He thus created Mediterranean Air Command under Air Chief Marshal Sir Arthur W. Tedder, the former commander of the integrated air forces in Egypt and Libya, and consolidated the disparate elements in Northwest Africa under Lt General Carl "Tooe" Spaatz in Constan-

tine, Algeria. Though this command is often referenced as 12th Air Force, that was actually an American element of Spaatz's integrated Northwest African Air Force. This command was further divided into integrated Strategic, Tactical, and Coast Defense Air Forces. Lt Lockhart's 82nd Bomb Squadron, along with their sister-squadron the 81st, were ordered to Berteaux Airfield, in Northeast Algeria, as part of Major General Jimmy Doolittle's Strategic Air Force.<sup>10</sup>

### Charley Lockhart's Tunisia Campaign

Lt Lockhart's journal covers almost all of the 1943 campaign season in North Africa. It begins just before the Battle of Kasserine Pass and includes the key battles of Lt General Patton's Gafsa Offensive (March 17-23), and the battles of Mareth Line (March 20-30) and Wadi Akarit (April 6-7), as well as Operation Flax's interdiction of the Axis air corridor (April 5-22) and the beginnings of the final offensive to take Tunis (April 22-May 13). Lt Lockhart took part in all of these operations, though he usually simply recorded the day's particular target and his experience, rather than discussing the larger context of the battle. His journal reveals key themes of his identification with British forces and dim view of inexperienced Americans and his dwindling enthusiasm and increasing war-weariness as the campaign continued, especially as the Axis forces' contraction concentrated their remaining air defense artillery. Additionally, it reflects Eisenhower's observation that bad weather was the greatest obstacle to air operations, as many missions were canceled due to obscured targets, and even at fields with concrete runways planes often became stuck in muddy dispersal areas.<sup>11</sup>

Lt Lockhart began his journal full of enthusiasm for his new chronicle and the chance to see new places, though his burgeoning cynicism shows mildly even on the first page, where he added to the printed E.B. Browning quote "all men are possible heroes," the word "posthumously." On February 12, 1943, Charley and his crew left Gambut, Libya, enroute to their new station in Algeria. They landed at the newly-captured Castel Benito airfield near Tripoli. There, he marveled at the sight of over 200 Italian and German airplanes and "six big hangers that were shattered from our bombs," as only two weeks before, it had been a target for the 12th, rather than an operating area. The next day, the crew flew over Axis-held Tunisia to Biskra, Algeria, which Charley described as "a nice clean little French town located on an oasis." Due to bad weather at their new base, the crew spent two nights at a US-run hotel in Biskra, and Charley was excited to see the town and to sleep in an actual bed. He and crewmembers visited a tropical garden, which Charley described as "The Garden of Allah... where the picture starring Chas. Boyer and Marlene Dietrich was filmed," though this seems to be a misunderstanding, as it was actually filmed in several locations in Arizona and California. That evening he and the crew's navigator, Lt Patton, met "two cute French Madomazelles," who attempted to teach them French and invited them to the family home the next evening to meet



Gen Brereton, CC/US Army Middle East Air Forces visiting the 82nd (with the squadron bar in the background) in 1942. The general's jeep was a captured German vehicle.

their parents and continue their language instruction. Unfortunately, the weather cleared at the new base on the afternoon of February 15, and Charley and crew were ordered on, leading him to bemoan "there went Lt. Patton's + my French lesson."<sup>12</sup>

Lt Lockhart's spirits fell further on upon arriving at what he referred to as "Telergma," though the unit records specify that the 82nd was actually stationed at the satellite Berteaux Airfield, about five miles east Telerghma, in Northeast Algeria. He instantly determined that "we weren't going to like this set up on this side." A sortie of fellow B-25s from the 310th Bombardment Group landed right after their arrival and was "all shot to hell." Their crews claimed that their American P-38 escort had abandoned them when enemy fighters attacked. Between this and the state of the ground combat, which Lt Lockhart referred to (even before the Battle of Kasserine Pass began) as the Germans "just beating the Hell out of the American Forces on this side," whom he assessed as using "ole 1917 tactics." Not only were the local forces suspect, but the weather was miserable, both in terms of cold and of canceled missions, and mess conditions were upsetting, with long lines and nowhere to eat but out in the cold, which also described the food. Further, "the little Arab Kids" begging for food were "enough to break any hard hearted man." His first days in Algeria led him to reflect "how nice it would be to be back out in the Desert with the 8th Army."<sup>13</sup>

As the Battle of Kasserine Pass began on February 19, Charley did not mention it, instead recording the details of a shoot-down that the 310th had experienced several days before and noting that he had written "Cheezie." The next day he mentioned the situation on the ground, though only briefly. He started the day's entry with a discussion of another mission canceled by weather and the fact that he had been recommended for an Air Medal and moved on to note that he had acquired a second blanket and that "six more should be warm enough." Only then did he add the spare comment "Jerry pushed the Americans back 50 mi. today." The situation became much more important to him on February 21, when the crews were briefed to be ready to evacuate the field as "the Germans are advancing so rap-



"Home in the Desert at El Alamein," apparently Landing Ground 88.

idly." Lt Lockhart noted that the Germans had captured several fields the night before. He was likely referring to the loss of Thelepte Airfield, just south of Kasserine, which Eisenhower referred to as "a serious matter for us" in spite of most planes evacuating safely, as it pushed air assets back from the front. Despite the fighting at Kasserine, the unit's mission that day, as part of the Strategic Air Force, was the railhead at Gafsa "where Jerry gets all of his supplies from Sfax," rather than direct support to the ground troops. Lt Lockhart's plane had to turn back from the target when its instruments and guns went out. Meanwhile, their sister-unit the 310th flew a sea sweep to interdict Axis supply and claimed the sinking of a fuel tanker and its escort. Unable to participate in the fight, Charley instead continued to compare the American forces to the British, reporting that in the past two days the 8th Army had advanced 50 miles, and the Americans had lost 70 miles. He noted wryly, "the 8th Army will never join us that way."<sup>14</sup>

Lt Lockhart's mood turned with the weather on February 22, as he was able to fly his first raids in the new theater. The 82nd bombed a bridge that the Germans were using in their advance, and his spirits seem high, despite the fact that the overcast conditions made him doubt they hit the target and that they were "all shot up by flak." The next day he was particularly excited to note their bomb load of 72 fragmentation bombs, leading him to speculate that the target must be an airdrome. Sure enough, the February 23 mission headed for an enemy airfield near Kasserine, putting him in the thick of the battle. Charley described this mission in detail, noting that they picked up 23 Spitfires for escort at "Yukes" (Youks-le-Bains on the Algerian-Tunisian border, now known as Hammamat) before heading south to the target. As they were approaching, a formation of B-26s were leaving the target and "ack ack was bursting all around them." Through a break in the overcast, they saw enemy fighters taking off, so "we opened our bomb bay doors and started toggling." In spite of heavy flak, only one plane took a significant hit, and it was able to return safely to base. Thereafter, their escort Spitfires circled the base hoping for enemy fighters to come up and engage, but they did not, leading Charley to comment "they're 'sceered.'" This action seems to have invigorated Lt

Lockhart, who wrote under the page's printed Daniel Webster quote "Independence now and Independence forever!" the response "Hitler today but Allies tomorrow."

For the next several days, Lt Lockhart flew no missions. His plane was broken on the 24th. On the 25th, he took advantage of a scheduled down day to hitch a ride into Constantine, a "fairly nice town if you can speak French." There he met several members of his initial flight training cadre at the Casino, including a B-17 pilot recently transferred from England, which he described as "a swell place for American soldiers – wine – WOMEN – + Fun." The joy of his pass was mitigated by the ride back in an open staff car in the sleet. Even worse, the sleet made the field so muddy that most planes couldn't get off the next day. Although the runway was paved, the parking areas simply had pierced steel plank or broken stone which, as Eisenhower remarked, often "merely sank in the mud." Although Charley seemed much more positive after the action and some down time, he also noted that the eight months of combat had led two navigators to "crack under the strain," including one that "went complete nutz" and was being sent home.<sup>15</sup>

In spite of their assignment to Strategic Air Force, Lt Lockhart's next five missions (scheduled for eight, but three were lost to maintenance issues) were all in direct support of ground operations, meeting the northern horn of the Axis offensive *Unternehmen Ochsenkopf* (Operation Ox Head, February 26-March 4). This operation, meant to follow up on the success of Kasserine Pass, was to be the last Axis offensive in North Africa. Though again Charley did not report on the offensive per se, the targets and the two-a-day sortie rate make the connection clear. From February 28 through March 3, the 82nd attacked troops and tank concentrations in Mateur, Tunisia, the launch point of the Axis operation. On March 3, they also attacked troops at the culmination point of the offensive, the ancient Numidian town of Bedja. The bombers re-visited their Egyptian tactic of taking off for a mission from their main operating base and then landing at an advanced fighter base for refueling and rearming for another sortie. In this case they used Tingley Field, near Bone, Algeria, and the home of their escort Spitfires. On February 28, Lt Lockhart spent several hours there talking with his RAF counterparts while awaiting rearming. He reported that the Brits appreciated the B-25s and enjoyed working with the Americans, for all that they complained bitterly of the "Yanks" in England, who "were taking their girlfriends back home."<sup>16</sup>

Lt Lockhart's experiences on March 2 illustrate several of the main themes of this article particularly well. Once again, the B-25s were escorted by Spitfires from Tingley, and this mission gave them some hot work as twelve German fighters attacked as the formation came off target from their first sortie. The Spitfires kept the fighters away from the bombers, unlike the P-38s from the 310th's February 15 mission, and also managed to shoot down three German planes with no friendly losses. When the *Mitchells* arrived at Tingley to refuel and rearm, they found the Northwest African Air Force commander, Lt General



Pre-mission brief for the mission of March 23, 1943, from Bertaux Airfield, near Telerghma, Algeria. The photo is taken in front of the operations tent.

Spaatz, and his boss, the Mediterranean Air Force commander, Air Chief Marshal Tedder, visiting the base. Lt Lockhart's concern was less for their exalted place in his chain of command, however, than for the kind words Tedder offered about the Earthquakers' formation flying. Charley was similarly impressed with their fighter escort. After that exuberant beginning, the day turned sour, first as Charley considered the fate of the townspeople of Mateur, who were "catching hell" from the bombers because of the German tank depot in town. Then, on arriving back to Bertaux, he discovered that the B-26s had lost four ships during the day's raids "trying to knock out a bridge at 60 feet."<sup>17</sup>

Lt Lockhart's exhaustion and frustration with his American cohorts found free expression over the next two days, as a new group of B-25s (the 321st) arrived, and he wished that they were there to replace them. He was also struck by just how many combat missions he'd flown when he was told he had been recommended for the Distinguished Flying Cross and an Air Medal with three oak leaf clusters. Lt Lockhart noted that his squadron had more missions than any other, adding "see whose doing the work – we should be the first to go home." He further discussed how much they preferred working with British forces, claiming that they'd been doing so for so long "we're nearly British ourselves." This led him to vent about how other American units wouldn't listen to their advice about adopting British tactics, leading to tragedies like the bridge raid above. Charley closed the entry with "that's why we work with the British – you can't get those hot American boys to listen to sense – they are the best fighters on earth – some joke." To add insult to his feeling that they were doing the lion's share of the fighting, the next week Lt Lockhart heard that the medal recommendations had been denied, which he called "low," and mused "I guess its because we're from the desert."<sup>18</sup>

The meeting between Spaatz and Tedder, when Spaatz found his "strategic" bombers tasked with seemingly tactical tasks, seems to have had results. From March 4-16, all

noted sorties from both the 12th and 310th Bomb Groups were more strategic, hitting airfields and running sea sweeps to interdict Axis supplies and reinforcements. Nonetheless, the need for bombers for tactical tasks was clear in both responding to the early March German advance and to support upcoming allied advances. Thus, on March 20, 1943, Northwest African Air Force reassigned six squadrons of light bombers and their 12th Bomb Group B-25s to a newly-formed Tactical Bomber Force. This organization fell under Air Marshal Sir Arthur Coningham's Tactical Air Force, which had the primary mission of close support of ground troops. The change of organization may have been the impetus for Lt Lockhart's note on March 11 that they were going to move up to a forward base to fly two to three close support missions a day for the "approaching Push." This brought a burst of enthusiasm, claiming "they don't call us the 'Fightin Twelfth' for nothing. Jerry's goose is cooked, and we are the KPs." Although they did move up, the mix of targets Lt Lockhart flew against continued to be dominated by airfields, with only occasional close air support missions. This likely reflects Tactical Air Force's focus on offensive counter air, rather than "air umbrellas."<sup>19</sup>

The biggest changes that mid-March brought to Lt Lockhart were personal. He became officially engaged to Cheezie, receiving a letter from her on March 9. He didn't note the contents, but the next day he wrote her mother to inform her of their plans and noted rumors of his unit rotating back to the States in April with "I hope they know what they are talking about. I wanta get married." When he finally got his back pay, he converted it to a money order, which he sent to Cheezie to put in their joint savings account for setting up a household when the big day came. Additionally, he did, as predicted, move forward on March 15, relocating to Can Robert (now Oum al-Bouaghi) Algeria, 50 miles closer to the front. There, his incoming boss, Air Marshal Coningham, gave the crews "a little talk" which Charley described as "not quite so optimistic as he was back on the El Alamein front." Finally, on March 16, his squadron commander, Major Hall, assigned Lt Lockhart as an aircraft commander.<sup>20</sup>

On March 17, the Earthquakers began supporting Patton's Gafsa offensive (March 17-23). The original plan was to fly two raids, with Charley flying his last as a copilot with his old crew in the morning, and the second in the left seat with his new crew. The first sortie went like clockwork, with the bombers striking 15 minutes before the ground forces assault, which, according to reports the pilots heard in debrief, took the town in less than half-an-hour. The weather then rolled in, however, and delayed Lt Lockhart's first mission in command – by four days. When his chance finally came on March 21, instead of supporting Patton's push, he flew all the way across Tunisia to strike Gabes airfield, just north of the Mareth Line. Though he didn't realize it until the next day, the Battle of Mareth Line (March 20-30) had begun, and his mission suppressed Luftwaffe support to Axis troops. It was Lt Lockhart's new copilot, Lt Shinnars, first mission, and, as Charley put it, "was a honey," with flak striking the wing. Though it did no damage, it "sounded as tho the ship was being torn to pieces."<sup>21</sup>



Part of an eighteen-ship raid flown on March 23, 1943, that targeted German motor transport and tanks on the Gafsa-Gabes road. Major Hall, 82nd Bomb Squadron commander led the formation in tail number 78.

The crew spent the next week alternating between the two fronts. They mostly hit airfields near one or the other, though once they engaged motor transport and tanks on the Gafsa-Gabes road. The March 26 mission to Tebaga, near the Mareth Line, was particularly eventful. The bombers had to fly through flak for 15 minutes on the way into the target, and Lt Lockhart's position in the formation made him "ack-hole Charley." Though they successfully struck the Luftwaffe dispersal area, Lt Lockhart's plane was hit multiple times, and an RAF observer aboard was struck twice in his leg. A near miss shattered the windshield and sprayed both pilots with sharp fragments, and several hits put holes in the aircraft and took out the hydraulic system. They were able to return safely to base, but had significant trouble getting the landing gear down. After circling for an hour, they were able to crank the gear down by hand and get it to lock, but with the hydraulics out they also had no brakes, making for a difficult landing. Charley reported that the afternoon mission "had the hell shot out of them also," and that after the two raids only ten of the squadron's 22 B-25s were flyable. Nonetheless, they were back in action in four days. The March 26 missions capped several days of bombing at Tebaga which destroyed 28 aircraft on the ground and forced the Luftwaffe to abandon the field, withdrawing over 70 miles north to Sfax and La Fauconnerie.<sup>22</sup>

On 30 Mar, Tactical Air Force chased the Luftwaffe to these new bases and discovered that they had "a heavy build-up of flak withdrawn from the abandoned airfields further south." Lt Lockhart missed this sortie, when the formation leader took his plane when there were problems with his own. Even though the weather was fine, the heavy operations tempo was affecting aircraft effectiveness rates. Even with spares, only 12 of 18 ships scheduled for the mission managed to take off, and "that 12 had the heck shot out of them over the target – Jerry has the deadliest anti-aircraft batteries." Lt Lockhart also reported that the elements of the 12th flying from Tripoli had lost two ships and their crews over the Mareth front. Fortunately, the Battle

of Mareth Line ended that day. Unfortunately, that made the consolidation of air defense in the remaining Axis pocket of Tunisia even worse.<sup>23</sup>

It was four days before the 82nd would test those defenses, however. Instead, Lt Lockhart dealt with the frustrations of weather and news of lost comrades. On March 31, Charley vented that "this early rising on freezing mornings for nothing is gradually getting monotonous." Further, he heard that day that Lt Jamison, a squadron mate with a pregnant wife, had been shot down, which "hit us all hard." Charley was particularly concerned about Lt Jamison's wife, writing "it will be a terrible blow to her, I know - that is the horror of WAR." The weather continued to cancel the next days' missions, leaving Charley little to do but write letters.<sup>24</sup>

From April 3-5, the Tactical Air Force attacked Sainte Marie du Zit Airfield, about 50 miles south of Tunis. While each mission had issues, April 5 was a particularly difficult day. Lt Lockhart had not even been scheduled for that sortie. He and his copilot, Lt Shinners, had been flight testing a repaired *Mitchell* when they were suddenly tasked as a replacement for a plane that fell out. Their escort fighters were operating out of Sbeitla, Tunisia, east of the Kasserine Pass. While the bombers were circling there waiting for their escort to join them, they could see a German air raid on Thelepte, which the Allies had retaken. Ten minutes out from the target, the flak got so thick that Charley remarked "only the wash lady will know how scared I was." As tail-end Charlie (or "Charley" in this case), Lt Lockhart got extra attention. He was already feeling that his nerves were shot after 20 minutes of flying through flak zones, where it seemed "like every burst of those 88mm guns were hitting me," when German fighters appeared. Lt Lockhart and his old aircraft commander from his copilot days, Lt Kirkpatrick, were at the end of the formation and were jumped by ME 109s and Folke Wulfes. Two members of his old crew were wounded, and though no one on Charley's plane was hit, "we had our share of holes," including one in the gas tank that left him to limp home leaking fuel. When he landed, Charley heard that the A-20s had lost five ships, that two of the 81st squadrons' planes had crash landed at the fighter base, and that one B-25 had augered in, killing the whole crew. One of the crewmembers on that ship was a buddy of Lt Shinners, who was taking it hard. Through all this, Charley noted an odd detachment in himself. He wrote, "it's terrible, but after so long at this damn fightin a man gets hard as nails – all he's concerned with is his own personal safety." While he didn't directly refer to himself as a likely case, Charley called this his worst mission and noted "many more raids like today's and Doc Akers is gonna have some flak-happy pilots on his hands."<sup>25</sup>

As well as being his worst, that was also, for various reasons, Lt Lockhart's last mission for two weeks. The following two days he had no plane available, as half of the squadron's aircraft were "out due to accurate German ack ack." Each of these days, small formations sortied as part of the Battle of Wadi Akarit (April 6-7). The first attacked another airfield, and the second hit dispersed motorized transport as part of what Hammel called an "all-out effort



Charley's crew (and two friends) on leave in front of the Yarden Hotel in Tel Aviv, operated by the U.S. government as an officers' club. The crew, from the right, was Lt Kirkpatrick, Lt Stanford, Lt Charley Lockhart, and Lt Patton.

to harry German Army forces retreating before massive ground attacks throughout Tunisia." By the end of the day, the two fronts united as the US II Corps and the British 8th Army made contact. Charley's only comment was "what no airdrome?" For the next three days, what Charley called "bomber command" gave the unit a stand down and began rotating crews for three-day rest-and-relaxation trips to Algiers. On April 8, Lt Lockhart ferried one of the crews there and remarked that he couldn't wait to get his own chance to relax for a few days, noting "this war is tearing my resistance down." He tried fitfully to write Cheezie over the next few days, but couldn't get a letter to come together. He finally sent one on April 11 that he considered "not much of a letter," but managed to at least send off the money order and some pictures.<sup>26</sup>

When Charley got his opportunity for a three-day pass in Algiers from April 16-19, it did not live up to his expectations. On his first day, he was disappointed at how early everything closed and at how much walking they had to do, as there was no means of transportation. His second day was more exciting, though not in a positive way, as "Jerry sent 15 planes over to bomb the convoy in the harbor." It was Lt Lockhart's first experience on the receiving end of an air raid, and he remarked "I prefer the desert." There was another raid the next evening, and Charley was struck by how "you feel so helpless when you are on the ground." When he returned to base, he considered it "a relief to get back home and back to work."<sup>27</sup>

That relief was not long-lasting. On April 20, the Tactical Bomber Force joined the Strategic Air Force in a large-scale offensive against airfields in and around Tunis as part of Operation Flax, which was intended to cut the air transport corridor between Italy and Tunisia. Lt Lockhart did not reach the target. As soon as they entered enemy territory, the flak began, and, in spite of evasive maneuvers, hit the ship "from nose to tail." Ten minutes into German territory, a direct hit took out the left engine, and a fragment from another shot came through the underside of the fuselage and hit Lt Lockhart in the left foot. Charley took his plane back towards friendly territory on one engine, handing control to Lt Shinnars once they were on the way so that the bombardier could perform first aid on his



Charley Lockhart getting his shoes shined for a piaster (equivalent to 4 cents) in Cairo in 1942.

foot. Fortunately, it turned out to be a flesh wound, though a large one, and Lt Lockhart took control back once bandaged. By this point, the right engine was also acting up, and once the crew lined up on Kings Cross (aka Souk-el-Arba), their forward arming and refueling field in Northwest Tunisia, they discovered that the hydraulics were out and the landing gear would not come down. While the crew attempted to manually crank the gear down, the right engine gave out, and Lt Lockhart was forced to make an emergency belly landing short of the airstrip. The ship still had its bomb load and was carrying British "stick-fused" bombs that had a reputation for going off "with the least bit of disturbance."<sup>28</sup>

Amazingly, given a gear-up landing on a dirt road that then slid through what Charley described as "two fences and a highline, then on through 28 telephone wires," no one was injured in the crash and the bombs didn't go off. The crew ran away from the plane "like a bat-out-a-hell," with Charley forgetting his foot injury in the rush to get out of the potential blast zone. A British officer who had been in one of the cars that Lt Lockhart "ran off the road" in his landing took him back to Kings Cross, where Doc Aker redressed his foot and sent him on to the 61st station hospital, just south of Constantine. While a patient there, Charley learned that his old crew with Lt Kirkpatrick had been shot down on the same mission and made a successful emergency landing, though they had one death to go with their injuries. The radio gunner apparently bailed out too low, rather than stay with the plane as Lt Kirkpatrick attempted to land, and broke his neck.<sup>29</sup>

Lt Lockhart spent at least four days in the hospital. On the second day, he remarked that of the eight officers in his ward, four were from the 12th Bomb Group. As far as Charley was concerned "you can see whose fitin the war – all of us are ack ack victims too – the Purple Heart Brigade." Two days later, on April 24, he made his last entry in the journal, simply recording "hobbling on crutches today." He left four lines below and the entire last page of his journal blank.

### After the Journal

Lt Lockhart returned to flying duty with the 82nd Bomb squadron and flew four more bombing missions,



The long overdue presentation of (by now Captain) Lockhart's combat medals at Venice Field, Florida in June, 1944.

reaching a total of 40. It is unclear when he was released from the hospital, so it is uncertain whether he took part in the final offensive in Tunisia (April 22-May 7, 1943). He flew at least one raid on the island of Pantelleria off the coast of Sicily, which was the squadron's primary target from May 8 until June 10. While newspaper accounts put his last mission on that date, his military records show him as detached for rotation to the states on May 29. This aligns with squadron records that mention six (unnamed) pilots transferred to the US that week, as well as six more the next. Charles L. Lockhart was promoted to Captain, effective May 31, 1943. He arrived home in Stephenville, Texas, on June 23, and married Pauline "Cheezie" Craft in a military ceremony on July 1, 1943.<sup>30</sup>

After leave and a course in directing aircraft maintenance, Capt Lockhart transferred to Venice Field in Florida, where he took command of a squadron that prepared service groups for overseas duty. In June 1944, his long-promised medals caught up with him, and he was formally presented with the Distinguished Flying Cross, the Purple Heart, and the Air Medal with three oak leaf clusters. In August he was promoted to Major. He spent most of 1945 at a series of assignments at Mitchel Field in New York, including another squadron command, and stayed on active duty after the war ended, volunteering for occupation duty in Germany. In 1947, with the Army continuing to downsize and the Air Force standing up as a separate service, Maj Lockhart was unable to secure an active duty Air Force commission. He was promoted to Lieutenant Colonel on reserve status on May 12, 1947, and, intent on remaining in service, accepted an enlisted position in the active duty Air Force, serving as a Master Sergeant from July 1947 through May 1951.<sup>31</sup>

Lt Col Lockhart was recalled to active duty with the Air Force in 1951 as part of the Korean and Cold War build up and served in that rank, primarily within Strategic Air

Command, until his retirement in July 1967. During this period, Lt Col Lockhart participated in the test and evaluation of the B-47, flew KC-97s and B-52s, and commanded multiple squadrons at March AFB, California, and Malmstrom AFB, Montana. His final assignment was as Deputy Commander of FE Warren AFB, Wyoming. In 1967, he and Cheezie returned to their Texas roots, where he worked as a banker in Fort Worth until 1983. He passed October 24, 2011, survived by his wife of 68 years, Pauline "Cheezie" Craft Lockhart, and 19 descendants. As of this writing, Cheezie is still living in Fort Worth.<sup>32</sup>

Although Charley may have argued that his extensive time in command was more impactful, his service in North Africa was exemplary and his record of it helps us to better understand this early period of American involvement in World War II. General Eisenhower argued that airpower in the North African Campaign was extremely improved after the February 1943 reorganization that combined British and American forces. He claimed that the results achieved showed that Tedder and Spaatz "accomplished a practical perfection" in coordinated employment. But that coordination went even deeper at the tactical level. As seen in Charley's journal, the allied air arms became a true combined force in the air above Tunisia.<sup>33</sup> ■



Charley Lockhart, his father Kenneth, and grandfather John from a newspaper article entitled "From 1865, Through 1917 to 1942--They're Fighters," *Fort Worth Star-Telegram*, June 6, 1942. The back of the photo notes that John fought in the Civil War, that Kenneth was injured by mustard gas in WWI, and Charley was commissioned in May 1942.

1. For examples of the early advertisement of the journal see "Cook's Drugstore Advertisement," *Greeley Daily Tribune*, November 13, 1942; "Taylor Drugstore Advertisement," *Louisville Courier-Journal*, November 14, 1942; and "Ticknor's Pharmacy Advertisement," *Ironwood Daily Globe*, November 14, 1942; On George McGovern's diary, see George S. McGovern and Andrew J. Bacevich, *My Life in the Service: The World War II Diary of George McGovern* (New York: Franklin Square Press, 2016); I am indebted to the Lockhart family, especially Charles's son Mike and grandson Mark, for access to Charles Lockhart's records, particularly his journal, "Service Diary of 1st Lt. Charles L. Lockhart" (1943), Lockhart Family Collection. All quotes from the journal are given with the original, often intentionally incorrect, spelling, without distracting [sic] notations.
2. For illustrations and comments on quotes, see Lockhart, "Service Diary." For primary source command-level discussion of themes above, see James Cash, "The Employment of Airpower in the North African Campaign" (Unpublished collection of source documents, 1951, now declassified and available at Air University Library, Maxwell Air Force Base); and Dwight Eisenhower, "Eisenhower Report on Torch" (1944, ADA438657, Defense Technical Information Center, <https://apps.dtic.mil/sti/citations/ADA438657>). The best modern scholarship on these issues is Christopher M. Rein, *The North African Air Campaign: U.S. Army Air Forces from El Alamein to Salerno*, (Lawrence, Kan: University Press of Kansas, 2012).
3. Charles Lockhart, "Autobiography" (1956), Lockhart Family Collection; "From 1865, Through 1917 to 1942—They're Fighters," *Fort Worth Star-Telegram*, June 6, 1942; "Locklear and Elliot Plunge to Death while Making Night Movie," *Fort Worth Star-Telegram*, August 3, 1920; "Stephenville Pilot Hero Wounded in Combat: Former Tarleton College Athlete has Fought Axis in Africa," *Fort Worth Star-Telegram*, May 15, 1943; Lockhart, "Service Diary."
4. Lockhart, "Autobiography;" "Service Record of Charles Lockhart," 1951, Lockhart Family Collection; "Begins Basic Training," *Fort Worth Star-Telegram*, November 21, 1941; "71 Bombardiers, 82 Twin-Engine Pilots to Graduate," *Victorville Victor Press*, May 22 1942; "33 New Fliers at Local Base," *Columbia Record*, June 5, 1942.
5. Rein, *The North African Air Campaign*, 56-57; Eric M. Hammel, *Air War Europa: America's Air War against Germany in Europe and North Africa, 1942-1945: Chronology* (Pacifica, CA: Pacifica Press, 1994), p. 61; Leon Kay, "British, Yanks Halt Rommel," *New York Daily News*, September 2, 1942; Barbara Stahura, *Earthquakers: 12th Bombardment Group (M)*, (Paducah, Ky: Turner Pub, 1998), pp. 18, 23.
6. Rein, *The North African Air Campaign*, 64,67; GP-12-SU-OP-S, 12th Bomb Group Mission Reports, U.S. Air Force Historical Research Agency Archives, Maxwell AFB, Ala., (hereafter 12BG MISREPS).
7. 12BG MISREPS, Stahura, *Earthquakers*, p. 25; "Service Record of Charles Lockhart;" "Sgt Necessary Lives Up to Name but Plane is Lost," *Fort Worth Star-Telegram*, March 4, 1943.
8. 12BG MISREPS.
9. Dwight Eisenhower, "Report on Torch" (1944), 17-23, 36-37; Stahura, *Earthquakers*, p. 27.
10. Eisenhower, "Report on Torch," pp. 36-37, 51; "Strategic Air Force Order of Battle, 27 February 1943" in Cash, "Employment of Airpower" p. 11-12. The order of battle above gives the other detached squadron as the 434th, but both unit records and Lt Lockhart's journal agree that the 81st went to Tunisia with the 82nd.
11. Eisenhower, "Report on Torch," pp. 41, 43-46; Lockhart, "Service Diary."
12. Lockhart, "Service Diary," entries for 12-15 February, 1943.
13. "Strategic Air Force Order of Battle, 27 February 1943" in Cash, "Employment of Airpower" pp. 11-12; Lockhart, "Service Diary," entries for 15-12 February, 1943.
14. Lockhart, "Service Diary," entries for 19-21 February, 1943; Eisenhower, "Report on Torch," p. 35.
15. Lockhart, "Service Diary," entries for 24-27 February, 1943; Eisenhower, "Report on Torch," p. 23.
16. Lockhart, "Service Diary," entries for 28 February-3 March, 1943; Eisenhower, "Report on Torch," p. 41.
17. Lockhart, "Service Diary," entry for 2 March, 1943.
18. Lockhart, "Service Diary," entries for 3-5 March, 1943. Among the British habits Lt Lockhart had absorbed was the use of the pejorative term "wog" for native North Africans. Interestingly though, he used it almost exclusively to refer to places. For example, Cairo was a "wog city" and a native structure was a "wog barn." He almost always referred to North Africans, with whom he would often barter, as "Arabs," even when stationed in areas that made it more likely that he was interacting with Amazigh (Berber) people. The one exception was when he was enjoying the fruits of petty theft, referring to it as chicken that enlisted men had stolen from "some wogs." Perhaps this usage was a subconscious attempt to minimize the transgression.
19. "Tactical Air Force Order of Battle, February 1943" in Cash, "Employment of Airpower" pp. 12-13; Eisenhower, "Report on Torch," p. 37; "Report on Air Operations by 242 Group R.A.F. In Support of 1st Army Tunisia, 1943" in Cash, "Employment of Airpower" p. 51; Lockhart, "Service Diary," entries for 20 March-20 April, 1943. As late as 2 April 1943, ground forces commanders were still complaining about this change, with II Corps claiming "total lack of air cover for our units has allowed German Air Force to operate against us at will." "NATAF Report on Tunisia," in Cash, "Employment of Airpower" pp. 65-66.
20. Lockhart, "Service Diary," entries for 10-16 March and 31 March-2 April, 1943.
21. Lockhart, "Service Diary," entries for 16-22 March, 1943; Eisenhower, "Report on Torch," pp. 43-44.
22. Lockhart, "Service Diary," entries for 22-26 March, 1943; "NATAF Report on Tunisia" in Cash, "Employment of Airpower" p. 63.
23. "NATAF Report on Tunisia" in Cash, "Employment of Airpower" p. 63; Lockhart, "Service Diary," entry for 30 March, 1943; Eisenhower, "Report on Torch," p. 43.
24. Lockhart, "Service Diary," entries for 31 March-2 April, 1943.
25. Hammel, *Air War Europa*, 118; Lockhart, "Service Diary," entries for 3-5 April, 1943.
26. Hammel, *Air War Europa*, 120; Lockhart, "Service Diary," entries for 6-8 April, 1943.
27. Lockhart, "Service Diary," entries for 16-19 April, 1943.
28. Hammel, *Air War Europa*, p. 124; Rein, *The North African Air Campaign*, pp. 127-128; Eisenhower, "Report on Torch," p. 44; Lockhart, "Service Diary," entry for 20 April, 1943. Charley would later remember this shoot-down as being caused by enemy fighters in a paper he wrote for a professional military education course in 1956, but given the diary's certainty and the fact that later newspaper accounts credited anti-aircraft artillery, it is likely that the later paper conflated the 5 and 20 April missions.
29. Lockhart, "Service Diary," entries for 20-21 April 1943.
30. "Captain Lockhart of Stephenville Home After Helping Put Ax to Axis in Africa," *Fort Worth Star-Telegram*, July 1, 1943; "Service Record of Charles Lockhart;" "82 Bomb Squadron Weekly Activity Reports," 1943, SQ-BOMB-82-SU-RE-D, Air Force Historical Research Agency.
31. "Captain at Venice Field is Awarded Six Medals," *Tampa Tribune*, June 6, 1944; "Service Record of Charles Lockhart."
32. "Service Record of Charles Lockhart;" Lockhart, "Autobiography;" "Airmen do 50 Miles In 12:50 Hours," *Great Falls Tribune*, February 25, 1963; Colonel Conley B. Stroud to Lieutenant Colonel Charles L. Lockhart, April 17, 1967, Lockhart Family Collection; Charles Lockhart, "Request Waiver of Active Duty Service Commitment Date," April 26, 1967, Lockhart Family Collection; "Charles L. Lockhart," *Fort Worth Star-Telegram*, October 26, 2011.
33. Eisenhower, "Report on Torch," p. 52.

# Historical Perception vs Reality: the Story of Joseph B. Duckworth's 1943 Hurricane Flights



USAAF AT-6 Texan flying.

David Reade

The history of Hurricane Hunting, and particularly the aircraft flown into hurricanes, typhoons and tropical cyclones for reconnaissance, surveillance and research purposes (*since WWII*), as presented in the universal public domain, is woefully incorrect, misconstrued and in most cases suffers from a lack of pertinent archival information that has resisted review or has yet to make its way to public view. The true history of Hurricane Hunting is a much more comprehensive and equally convoluted subject than is currently presented in the public domain (*public domain, referred to here as that historical information contained within current and archival newspapers, magazines, books and internet web-pages as well as (now) archival meteorological literature.*)

A classic example of this “*perception -vs- reality*” of the history of hurricane hunting is the story of U.S. Army Air Forces Lt. Col. Joseph B. Duckworth, commander of the Bryan Army Airfield’s Instrument Flight Training Instructors School, and the historical perception that hurricane flights flown by Duckworth on July 27, 1943 were the first (*ever*) flights flown into a hurricane and that these flights prompted the U.S. Military to establish official hurricane reconnaissance flights the following year in 1944. And additionally, that Duckworth’s motivation to fly these hurricane flights in 1943 were precipitated by a “*bar-room bet*” or “*dare*” instigated by British RAF pilots undergoing training at Duckworth’s instrument flight school.

The reality (*of this history*) that surrounds this perceived historical event is that: Duckworth’s 1943 flights into the so-called 1943 Surprise Hurricane, in the Gulf of Mexico, were not the first to have ever been flown into a hurricane or into a hurricane’s eye, given that there were at least six other people who claim to have flown into hurricanes between 1920-1942; that Duckworth’s flights into the hurricane of 27 July 1943 went on to initiate official hurricane reconnaissance flights in the Atlantic in 1944, is inaccurate because official hurricane reconnaissance flights in the Atlantic were established weeks earlier on July 14, 1943 – that encompassed the commencement of the U.S. Weather Bureau’s “*Joint Hurricane Warning Center*” (*jointly with the U.S. Navy and U.S. Army Air Force*) that directed hurricane reconnaissance flights into Atlantic hurricanes during WWII. Additionally, that the story elements of the Duckworth flights regarding the motivation of the flights precipitated on a “*a bet or dare*” with British RAF pilots is incorrect, and this component of the story borders on “*mythology*” and is more than likely a fabrication.

## The Duckworth Flight(s) 1943

The public domain (*perceived*) version of the Duckworth hurricane flight story begins in late July 1943, as a tropical depression forms in the Gulf of Mexico, off the Louisiana coast, and tracks westward towards Texas. The depression quickly intensified into a hurricane.



Lt. Col. Joseph B. Duckworth with his AT-6 Texan; believed to have been taken shortly after his hurricane flights on July 27, 1943. (Photo courtesy of the Duckworth family.)

Although detected by forecasters at the New Orleans Weather Bureau office solely from upper air observation, wartime censorship (*due to German U-Boat activity in the Gulf of Mexico*) prevented the reporting of the storm on radio broadcasts. Newspapers, on the morning of the 27th carried notices of the storm in the Gulf and its potential approach to Texas, but contained no information on the intensity of the storm, or any specific landfall predictions or warnings.

Little known to all in the area, this so called “*Surprise Hurricane*” (July 25-29, 1943) was packing winds in excess of 80 mph (130 km/h) and was pressing westward towards Galveston Bay at 10 mph (16 km/h). At noon on the 27th, the hurricane came ashore in Texas with winds of 100 mph (161 km/h).

Duckworth, having seen the looming clouds on the horizon to the southeast, knew what they meant. He quickly seized on the opportunity to provide a training lesson for his students and announced that he could fly into the hurricane and return strictly on instruments.

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The surface weather chart for the surprise hurricane of July 1943. (Courtesy NOAA / Central Library.)

Established in March, only a few months earlier, the mission of Duckworth’s school was to train instrument flying to instructor pilots, that would then go on to various other flight training commands or combat squadrons in the different theaters of war, to teach instrument flying to other AAF pilots.

Duckworth was the leading expert on instrument flying for the USAAF at the time and had just spent most of 1942 writing the USAAF’s technical regulations and training documents (*procedures manual and training curriculum for instrument flying*) at the behest of General Henry “Hap” Arnold (*Chief of the U.S. Army Air Forces*) to quickly teach pilots to successfully fly in severe weather flying conditions safely.

Duckworth, at age 25, joined the U.S. Army Air Corps as a flying cadet in 1927. He was given primary & basic flight training at Brooks Field and advanced flight training



AT-6 Texas Trainer, like the one Duckworth used to fly into the Surprise hurricane of July 1943. (Photo courtesy of T6 Harvard Aviation.)

at Kelly Field – both within the San Antonio area of Texas. Upon graduation (*in 1928*) Duckworth accepted a U.S. AAC reserve officers commission and embarked on a civilian flying career. Between 1928 – 1943, Duckworth amassed approximately 13,000 flying hours, mostly from his civilian employment positions as a flight instructor and commercial / transport pilot (*flying passengers, airmail and cargo-freight*) that involved night flying and flights into severe weather of all kinds – that provided Duckworth with an ever-developing understanding of “*blind-flying*” or what is now commonly referred to as instrument flying.

Apparently, according to the public domain version of hurricane hunting history, Duckworth was having trouble impressing the importance of instrument flying on some of his pilot instructor students – including British RAF pilot students, who were reported veterans of the “*Battle of Britain*” and who were particularly resistant to his assertions about weather flying. There are even public domain references that suggest that the RAF students scorned the attributes of their single-engine AT-6 Texan training aircraft and questioned the robustness of the aircraft, since North American AT-6 Texans were generally made of low-alloy steel and plywood materials, as aluminum substitutes, due to wartime shortages.

As the story goes, a number of bets were bantered about, towards drinks at the officer’s club, about a successful trip into and out of the hurricane, and Duckworth, confident in his instrument flying abilities, gladly accepted the bets.

To help him navigate on the flight (*what would become his first flight into the storm*), Duckworth took along Navigator 2nd Lt. Ralph M. O’Hair. Duckworth and O’Hair took off and quickly climbed to 6000 feet (*1829 m*). As the AT-6 approached the storm, now over mainland Texas and tracking towards Houston, dark clouds gathered around the aircraft and turbulence began to be experienced increasing as they flew on. Soon Duckworth was fighting severe up and down drafts with torrential rains pounding on the roof of the plexiglass canopy – flying at altitudes between 4000 feet (*1219 m*) and 9000 feet (*2743 m*) to avoid potential icing conditions. But just when they thought it would never stop, the darkness eased and they broke out into blinding sunshine, with towering cumulonimbus wall clouds that make up the hurricane’s eye.

Determined to be approximately ten miles across, Duckworth and O’Hair orbited within the eye. O’Hair calculated the storm’s center and Duckworth radioed the storm’s fixed position to the Houston Weather Bureau station. This vortex report (*perceived as one of the first*) identified the location of storm’s center, which at this point was over land, because they could see the green countryside down below through the clear eye.

The storm itself came ashore over the Bolivar Peninsular, with second landfall ten miles (*sixteen kms*) southwest of the settlement of Double Bayou, Texas. Moving inland, it subsequently reached Houston by mid-night with winds of 80 mph (*130 km/h*) and higher gusts to 113 mph (*182 km/h*). The storm caused severe damage to war production plants and the Humble oil Refinery, where wind



AAF Navigator 2nd Lt. Ralph M. O’Hair, who flew on Duckworth’s first flight into the July 1943 Surprise Hurricane.

damage from a gust of 132 mph (*212 km/h*) was recorded. More than nineteen local fatalities and hundreds of injuries were reported after the storm passed.

During their exiting of the eye, severe turbulence tossed the aircraft about, and at one point, flipped the AT-6 over on its back and spun it around. Duckworth recovered the aircraft quickly and continued on a course back to Bryan Field more than 100 miles away.

After their return to base, having followed signals from radio beacons put in place at Bryan Field as part of the instrument flying and IFR landing procedures training, discussions ensued with Duckworth and O’Hair relating their experience and observations. This prompted the base weather officer to say he wanted to see the inside of a hurricane. Thus, Lt. Col. Duckworth opted to make a second flight back into the storm, this time with Weather Officer, 1st Lt. William H. Jones-Burdick.

In the public domain, the first and this second flight into the storm have come to be labeled flights of fancy, flown on a lark, predicated on a bet or a dare in numerous public domain newspaper, magazine and internet articles and stories. The last flight into the storm with Lt. Jones – Burdick onboard has even been touted as a milestone in the history of aviation and weather forecasting, as one of the first times that a trained meteorologist flew into the heart of a hurricane to make observations or that this was the very first hurricane research flight flown in hurricane history.

This perception is based upon the fact that during his flight into the storm, Jones-Burdick (*utilizing the aircraft’s in-flight thermometer*), made a temperature survey throughout the depth of the storm and found tangible proof that the eye of the hurricane was at least 25 degrees warmer than previously thought. He additionally recorded observations of the hurricane’s structure, that was subse-



Base Weather Officer, 1st Lt. William H. Jones-Burdick that flew on Duckworth's second flight into the storm.

quently captured in his written meteorological report of the hurricane flight made for his higher meteorological command – which happened to be the 3rd Weather Squadron/Region at Kelly Field, in San Antonio, Texas. The report was subsequently forwarded on to the AAF's weather service headquarters in Washington DC, located at Bolling Field, who in turn sent copies out to all major weather squadron's headquarters and associate weather stations. (i.e. the internet copy of Jones-Burdick's hurricane flight report is associated with the 8th Weather Squadron, headquartered at Presque Isle Army Airfield [Maine] that commanded a chain of weather stations strung out along the Arctic Northern Air Ferry Route, across the Atlantic)

It is interesting to note that the Jones-Burdick hurricane (*thermal*) survey conducted during the second Duckworth Flight on July 27, 1943, as outlined in his meteorological report on the flight submitted to his higher meteorological command, was later disproved and or discredited once official hurricane reconnaissance aircraft began flying into storms. There is evidence to suggest that the inaccurate temperature readings gathered by Jones-Burdick was owing to a faulty airborne thermometer that was placed too close to the aircraft's engine exhaust plume.

Thus, it has been generally accepted, within the public domain, that Duckworth's flights into this 1943 hurricane were the first recorded flight(s) into a hurricane's "eye." It has also been universally accepted that these hurricane flights by Duckworth, prompted the USAAF to accept that aircraft could be flown into hurricanes and survive, and established official hurricane reconnaissance flights in the Atlantic during the 1944 hurricane season. Additionally, the public domain version of the Duckworth flights further promotes that the flights themselves were predicated upon "a bet" between Duckworth and his (*British*) students.

Because of these historical perceptions, Duckworth is now internationally acknowledged (*thanks to the internet*) as having been the first person to have ever flown into a hurricane, with his flight(s) made in July 1943. However, the reality of this situation is that the Duckworth story is not historically accurate!

There is other historical evidence that persist to suggest that Duckworth's July 1943 hurricane flights were preceded by a number of other claims of hurricane flights going back to the 1920s. The reality is that at least six people, including a woman, are historically known to have flown into hurricanes well before Duckworth's 1943 flights.

The earliest of these known flights into a hurricane was made by another Army pilot in October 1920.

### Lt. Charles B. Austin Flight (1920)

In October 1920, one of the very first flights into a tropical cyclone occurred, when a young Army aviator survived an encounter with an unknown tropical storm or hurricane in the middle of the Caribbean.

In the golden age of manned flight, just after the Great War (*WWI*) when aviation feats were still the stuff of newspaper headlines, the U.S. Army Air Services tried to expand the parameters of military aviation. With General Headquarters approval, a number of advanced flying operations and experimental flights were conducted by the Army Air Services.

One experimental flight comprised a long-distance sojourn between the U.S. Army's France Field (*Panama, Canal Zone*) and Washington DC, via stops in Kingston, (*Jamaica*); Havana, (*Cuba*); Carlstrom Field, (*Florida*); Southern Field (*Georgia*); Pope Field, (*Fayetteville, North Carolina*) and on to Langley Field, Virginia. Army pilot "1st Lt. Charles B. Austin" was subsequently authorized to make the flight, and planned the attempt for October 6, 1920, in a De Havilland DH-4B single-engine, open cockpit, biplane. Lt. Austin personally supervised the modification of his De Havilland DH-4B biplane, stripping it down to



U.S. Army Air Service 1st Lt. Charles B. Austin, circa 1920.



Dark and ominous rainbands (aka: *outer convective bands or feeder bands*) like these, were noted in Austin's observations of his flight into a nascent tropical storm or hurricane. (Courtesy NOAA / Central Library.)

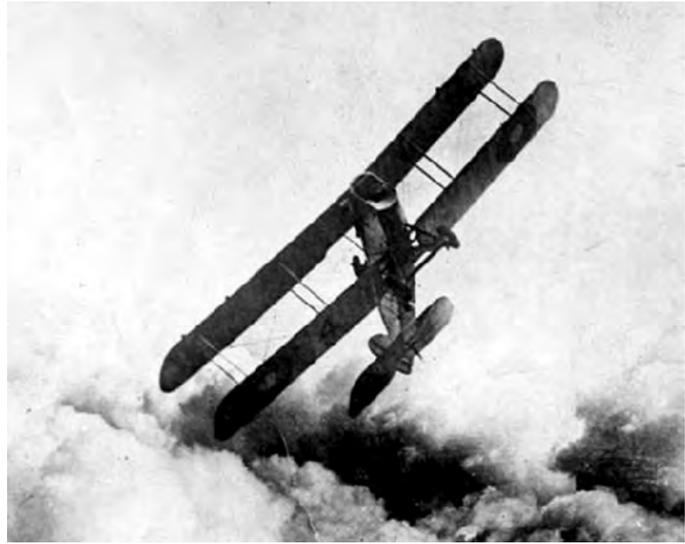
the frame and installing extra fuel tanks, with 225 gallons of additional fuel and twenty gallons of engine oil - an additional 1500 pounds added to the overall weight of the aircraft.

It was fairly sunny on the morning of October 6, 1920, when Lt. Austin set out on his long- distance flight across the Caribbean. (*there didn't seem to be much planned weather forecasting established for this flight*) Within the two months before the flight, weather conditions had been variable, with the last five days before the flight being fair. That morning, there was a barely perceptible dark cloud-bank on the horizon to the north and northwest.

However, more than two hours into the flight, the cloudbank on the horizon now loomed nearer and darker with every mile. Two more hours on and nearly 500 miles (805 kms) out into the Caribbean from Panama, on the first leg of the proposed record setting flight, squalls materialized in Austin's flight path ahead. Carrying onwards Austin's plane was enveloped by the storm. Despite the heavy rain (*seemingly walls of water*), strong winds and turbulence, flying in an open- cockpit airplane, Austin continued on, looking for a break in the clouds and the lessening of bands of heavy winds, walls of torrential rain and significant turbulence, to reach Jamaica.

According to analysis of Austin's (*documented*) observations, he evidently passed through the rainbands of a severe tropical storm and/or hurricane. His descriptions of the wave tops chopped off by the wind is indicative of a strong hurricane.

It wasn't until his propeller became damaged by the storm, that he actually feared for his life and envisioned ditching into the sea. His wooden propeller was covered with a doped fabric material which began to come loose and throw his propeller out of balance, causing severe vibrations and shaking of the plane's engine in its mounts. Only then did he decide to turn back for Panama. For the next three hours, Austin battled the storm, that had moved in behind him, in a damaged plane trying to get back to land. At around 4pm, Austin popped out of the storm's clouds into relatively clear skies and noticed offshore islands that he recognized as being within 120 miles (193 kms) of his base at France Field. Ultimately, he had made it back to base and survived the ordeal with the storm.



An open-cockpit, bi-wing De Havilland DH-4B like Austin's, breaks out of ominous storm clouds (circa 1920).

Although there is no record of a tropical cyclone in this area during the 1920 hurricane season, in the official Hurricane Database (*HURDAT*) at the National Hurricane Center, it doesn't mean there wasn't a storm there. With few reporting surface weather stations in the area at the time, and only a few ship reports during this timeframe, the storm encountered by Lt. Austin could have been an unknown errant hurricane that evaded detection by the (*then*) early Weather Bureau hurricane warning system.

All totaled, Austin had been in the air for ten and a half hours. Although his Commanding Officer, Brigadier General William L. "Billy" Mitchell, said that this flight would be tried again, it wasn't.

Later in April 1921, Lt. Austin was reassigned to Langley Field, Virginia where he served as a flight instructor at the Army Air Services (*fighter*) Tactical School there at Langley. Austin later died there in July 1928, from complications due to surgery after an acute illness.

## Other Hurricane Flights

During the latter 1920s and early 1930s, the air passenger transport industry literally took-off and particularly in the Caribbean and South America, where Pan American Airways reigned supreme. Pan Am's aviation achievements are legendary, and its historical (*archival*) records contain a number of incidents whereby Pan Am aircraft came in close contact with tropical storms and hurricanes.

One such incident occurred in December 1929. On the 29th, a scheduled Sikorsky S-38 Flying Boat (*Clipper*) flight from South America to Miami ran into an undocumented tropical storm. Despite efforts by the Pan Am crew to get out of the storm, subsequent damage to the aircraft forced them down into the sea near St. Thomas in the Virgin Islands. The pilot of the S-38 Flying Duck, of which 25 were acquired by Pan Am during this time, was forced to land the aircraft on the rolling sea. The crew, eight passengers and the mail were all subsequently rescued by a passing ship.



A Pan Am S-38 Duck flying boat, making a water Landing, (circa 1930)  
Florida State Archives

Later, during the Santo Domingo Hurricane of September 1930 (29 August – 17 September 1930), a Pan Am Clipper (another S-38 Duck) flying boat encountered a hurricane on a flight between Puerto Rico and Port-au-Prince (Haiti) - en route from Brazil to Miami. On 6 September, the Pan Am flying clipper encountered the storm suddenly and unexpected. The aircraft was swept up into the storm and carried along by winds of 160 mph (258 km/h), and experienced severe turbulence with considerable up and down drafts.

The Pan Am pilots, having found themselves near Santo Domingo (Dominican Republic), subsequently chose to land on the sea, before the flying boat had a chance to tear itself apart. The Clipper landed offshore, and the pilots actually managed to slowly taxi towards the shore, putting in at the small town of Barahona, just 15 miles down the coast from Santo Domingo city.

Although not intentionally flown into these storms, these hurricane encounters were a symptom of the hazards of early aviation in the Caribbean, with the Pan Am pilots able to fly into these storms and come out the other side – to tell the tales about it.



Victim of a hurricane (circa 1930). A crashed Pan Am Tri-motor aircraft in the Caribbean. (Courtesy Larry Weirather collection.)



Dot Lemon, air racer, (circa late 1940s / early 1950s).

### Dot Lemon Flight (1932 / 1937 ?)

The very first intentional flight into a hurricane may actually have occurred in April 1932 and its claimed by a woman.

Dorothy “Dot” Culver Whitney [Martin] Brink Lemon (generally known as “Dot Lemon”) was an early woman pilot of some notoriety in the 1930s and 1950s, and had a long career in aviation that included co-running an airfield in the late 1930s and early 1940s, was a instructor pilot during the same time period and later an Air Racer in the early 1950s. However, this doesn’t begin to demonstrate the unique and adventurous life that Dot Lemon lived over the decades between 1907-1986.

With regards to the subject at hand, Dot Lemon publicly claimed to have flown into a hurricane off the east coast of Florida on April 5, 1932, alone, in a single-engine Stinson Reliant SR-1 airplane, penetrating the storm’s center specifically to gather weather data for the Weather Bureau’s hurricane forecast office in Jacksonville.



A Stinson Reliant SR-1, like the one Dot Lemon claimed to have flown into a hurricane with, in April 1932. (circa 1940s).



Belvedere airfield and Lemon Flight Services (circa 1937-38).

However, a cursory review of the facts associated with Dot's hurricane flight reveals that there was no hurricane or tropical storm along the Florida coast on that date. Additionally, the Stinson Reliant SR-1 model aircraft, claimed to have been used on the flight in 1932, did not really come on the market until 1933-34 and then not in significant numbers until WWII. The Reliant, at the time in 1933-34, was considered an expensive aircraft for private pilots (between \$10,000 – \$18,000 in 1933 U.S. dollars / equivalent to \$221,158.00 - \$398,083.00 in 2022 US dollars) and was marketed strictly to large commercial companies as a corporate executive transport aircraft.

Additionally, the U.S. Weather Bureau's hurricane warning service, forecast office, was located in Washington, DC in 1932 and didn't move to Jacksonville Florida, as a regional hurricane forecasting center, until 1935.

Thus, these and other discrepancies seriously calls into question whether Dot Lemon could have conceivably flown a hurricane flight in 1932.

However, a more comprehensive inquiry into the life of Dot Lemon, regarding this issue, has subsequently stirred up some evidence to suggest that Dot may have actually conducted her claimed hurricane flight in 1937.

It was in 1937 that Dot seems to have been involved in conducting "APOBS" air observations (AirPlane upper air OBServations or APOBS) for U.S. Government weather services; that might have afforded her an opportunity by which to have had an encounter with a tropical cyclone. At the time, Dot was co-managing her husband's airfield (William Richmond "Dick" Lemon) and his flying service company in West Palm Beach, Florida. Known as Belvedere Field and Lemon Flight Services, this airfield was just a few miles north from what would become the USAAF's Morrison Army Airfield and much later still, the Palm Beach International Airport.

It's interesting to note, that under the pre-war operations of Lemon Flight Services', Dick Lemon's stable of aircraft included an "early" model version of a Stinson aircraft that would later be developed into the Reliant SR-1.

Additionally, although there are no hurricanes or tropical storms mentioned in National Hurricane Center (NHC) records or the HURDAT for April or May 1937, there are other National Weather Service records for this period of 1937 that suggest a tropical disturbance did track up along the east coast of Florida and up along the mid-Atlantic states – that she could have flown on and reported.

Another interesting aspect of Dot's personal history, that lends itself to the possibility that Dot had (*potentially*) flown a hurricane in 1937, encompasses her application towards membership in the women's aviation organization known as the "99s". Its in this 99s application, where Dot for the first time claims to have flown into a hurricane in 1932. Moreover, a high-resolution scan of this application, which was filled out in pencil, potentially reveals evidence that can be seen, whereby she seemingly changed the date of her flight from 1937 to 1932. So, the question begs itself, why did she change the date (?)

In 1963, Dot again claimed to have flown into a hurricane (*in 1932*) in author notes associated with her metaphorical book entitled "One One: A Story of the Life, Death, and the Resurrection of an Airplane". The full and incredible life of Dot Lemon is fascinating, mysterious and a conundrum to those historians trying to document and define it. Unfortunately, there is not enough space in this historical treatise to begin to unravel it all.

However, with regards to her hurricane flight, there is currently no independently gathered record or evidence, beyond references traced back to Dot's own claims, that she ever flew a hurricane flight in 1932. But if it could be independently confirmed definitively, it would become the first ever intentional flight into a hurricane in history. Even if it were to be worked out and be confirmed that she flew her hurricane flight in 1937, it would still be a noteworthy achievement, as one of the first flights to have ever been flown into a hurricane and the first conducted by a woman aviator.

### Capt. Len Povey Flight (1935)

Another early (*confirmed*) hurricane flight that was intentionally flown on a hurricane occurred in September 1935, when Captain Leonard J. "Len" Povey scouted a hurricane in the Florida Straits for the Cuban weather service.

Len Povey is another one of those fascinating early aviators that just happened to have been associated with early flights into hurricanes. Povey was born in Nashua, New Hampshire in February 1904. Being so close to the Canadian Border, at age 14, Povey tried to join the Royal Canadian Air Force (*twice*) with no joy. He later turned to barnstorming in the 1920s, after having received U.S. Army Air Service pilot training at Brooks Field, Texas between 1922-24. Povey became famous for having develop a radical flight maneuver known as the "Cuban 8" during Barnstorming and airplane racing competitions.

Povey subsequently garnered the attention of the Cuban Army Air Force (*Fuezas Aéreas Ejército de Cuba*), who asked him to become a flight instructor pilot to help rebuild the Cuban Army Air Force – that at the time consisted of 5-6 airplanes and a cadre of barely trained pilots. Povey accepted the job and under contract to the Cuban Government, went to Havana to reorganize and train the Cuban Army AAF, between 1934-1938.

In early September 1935, the Cuban weather service was tracking a suspected hurricane (*on synoptic surface*



Povey with his Curtiss P-6S Hawk II open cockpit, bi-wing pursuit plane during his time in Cuba (circa 1934)

charts) in the Caribbean and was expecting the storm to make landfall in Cuba sometime late on the evening of 1 September. But by the morning of the 2nd, no storm materialized. The Cuban weather service (at the National Observatory) was concerned as to where the hurricane had gone, and subsequent discussions finally centered on getting the Air Force to send up an airplane to find it. Povey, being the most experience pilot, volunteered and jumped into his Curtiss P-6S Hawk II (an open cockpit, bi-wing pursuit plane) and flew out in search of the storm.

Some public domain and meteorological literary references suggest that the Cuban Army or Air Force meteorologists sent Povey out to look for the storm. These references would be incorrect! The Cuban weather services, headquartered at the National Observatory, was actually comprised of meteorologists from the Constitutional Navy of Cuba at the time of the 1935 Labor Day Hurricane. The Cuban Constitutional Navy ran the Cuban weather services until the Cuban Revolution of 1959.

By mid-afternoon, Povey located the hurricane in the Florida Straits. He made a reconnoiter around the storm and was able to confirm that the hurricane had turned northward sometime during the night or early morning and was heading directly for the Florida Keys.

By his own admission, in a later (written) report made to the Cuban National Observatory, Povey flew in close proximity to the disturbance within the outer fringes of the storm and noticed details associated with a very tight intense hurricane. He never actually penetrated the eye of the storm however, due in part to the fact that he was flying in an open-cockpit aircraft.

With his hurricane flight behind him, Povey continued training the cadre of Cuban pilots, until 1938. This cadre of Povey-trained Cuban pilots would go on to form the core of the Cuban Army Air Force flight training school in Cuba, from which most future Cuban military pilots would be trained.

After returning to the United States, and later with America's entry into WWII in 1941, Povey became the Di-



Povey with several cadet pilots at the Embry-Riddle's Carlstrom Field (circa 1942-43). (Courtesy of Embry-Riddle Aeronautical University.)

rector & Vice President of training operations for Embry-Riddle flight training schools. Embry-Riddle had secured U.S. Government and Allied contracts to train military pilot cadets between 1941-45. Embry (an old Barnstorming buddy of Povey's) put him in charge of four pilot training airfields in the southern U.S. (3 in Florida and 1 later replacement training base in Tennessee) training cadet pilots for U.S. Army Air Forces and the British RAF.

Dot Lemon and her husband, Dick "Doc" Lemon (as his friends called him), lost Lemon Flight Services when their Belvedere Airfield was expropriated by the USAAF as part of the pre-WWII expansion of Morrison Field in November 1941. Under U.S. Army airfield regulations, no civilian airfields within a six-mile radius of Morrison were allowed to operate, suspending all civilian flight activity within that area. By January 1942, after the United States entry into the war, all private, civilian, flying operations were transferred to the new Palm Beach County Airport at Lantana – south of WPB. Essentially forced out of business, Doc Lemon became a registered civilian flight instructor supporting commercial flight training contracts for the AAF and British RAF cadet flight training programs, including at one of Povey's Embry-Riddle flight training school in Florida and another flight training contracted agency in Texas.

Meanwhile, Dot, prevented from being a flight instructor herself during the war, stayed near Dick in Florida and later got work as a secretary at another flight training school in Oklahoma City when Dick transferred to Texas. She would often travel to Dick's training bases for parties and dances on the weekends. It's very plausible that Dot may have met Povey there in Florida and the story of his hurricane flight might have come up at a cocktail party – later prompting Dot to change the date of her own (potential) hurricane flight, from 1937 to 1932, just to make her flight the first. This sort of thing, arbitrarily changing details of her life to suit her internal need to be different and often times "first" was not an uncommon trait for Dot, which has confounded many historians trying to sort out the reality of the enigma that was Dot Lemon.

Relatively unknown within the public domain, and presented here potentially for the first time, is that there was another pilot that flew into the 1935 Labor Day Hurricane, after Povey, that "did" penetrate the storm's eye.



TWA Captain Daniel Webb "Tommy" Tomlinson, who flew into the 1935 hurricane as part of ongoing corporate meteorological research (circa 1935) (Courtesy of TWA and its associate TWA Museum.)

### Capt. Tommy Tomlinson Flight (1935)

Just a few days after Povey's flight into the 1935 Labor Day Hurricane, on September 6th, another famed American aviator named (Capt.) Daniel Webb "Tommy" Tomlinson flew into this hurricane.

Tomlinson had been an early pre-World War One (WWI) naval aviator, turned barnstormer, before becoming the chief research test pilot with Transcontinental and Western Airways (TWA) at the time of his hurricane flight in 1935.

Beginning in 1930, TWA established a meteorological department manned by professional meteorologists, to conduct experiments on weather related phenomenon associated with flying limitations to the commercial aviation industry. Various weather experiments conducted between 1930-40 comprised a study of atmospheric static interference of radio communications, research into aircraft icing conditions and how to counter icing effects on aircraft operations, a study of thunderstorms affecting commercial flight – that led to the TWA concept of "over weather flying" and the development of high-altitude (*stratospheric*) aircraft capable of operating into the stratosphere as a means to avoid limiting weather conditions. But it was under an investigation of aircraft icing that Tomlinson conducted his flight into the 1935 hurricane.

Under this particular weather research project, Tomlinson was exploring the limits of aircraft icing to understand specifically when icing conditions occur (*what altitudes?*) and to test a number of (*then early*) de-icing technologies, including Goodyear's development of inflatable de-icing "boots" (*incorporated into the wing leading edges, horizontal stabilizers and vertical fins of an airplane*) as well as alcohol-mixed de-icing fluids developed to keep propeller-blades ice free. The project also mapped icing



The TWA DC-1 flown by Captain Tommy Tomlinson into the 1935 Labor Day Hurricane.

(freezing) levels in clouds between 25,000 feet (7620 m) and 27,000 feet (8230 m).

Since the summer of 1935, TWA had also been conducting weather research projects to explore aspects of flying in adverse weather conditions (*such as severe mid-western thunderstorms*) as a means to develop procedures and or techniques for flying through or over such adverse weather– that also included the demonstration of pioneering techniques for blind (*or instrument*) flying for the rest of the fledgling airline industry and the general flying public at large.

In order to conduct airborne meteorological research, TWA developed several research flying laboratories including one based on the original DC-1 prototype transport aircraft. Acquired by TWA in 1933 as the Douglass Commercial (DC) transport prototype #1, which began the DC-2 / DC-3 series of passenger and military transports aircraft that became a mainstay for the early American airline industry and WWII military transport operations around the world, the DC-1 prototype (# X-233Y) was modified into meteorological research flying laboratory (*test*) aircraft by TWA and was subsequently used to fly into the 1935 Labor Day storm.

Tomlinson started developing a flight plan, once he became aware of the storm quickly tracking up through the mid-Atlantic States (*having previously struck the Florida Keys and mainland Florida*) that would have had them intercept the main expanse of the storm near New York City. However, by September 4th, the hurricane had lost strength and was downgraded to a tropical storm, with the area of the storm having increased in size - expanding gale force winds out several hundred miles from the center in all directions. Subsequently the storm tracked through the Carolinas into Virginia on the 5th, and by the early morning of the 6th, the storm passed seaward over Cape Henry (*at the mouth of the Chesapeake Bay*) back into the Atlantic, re-intensifying into a hurricane over the warm waters of the Gulf Stream later that morning.

It was during this period of re-intensification (*over the warm waters of the Gulf Stream*) that Tomlinson and his TWA research flight crew flew into this storm. Having seen the domed top of the storm towards the southeast from 27,000 feet (8230 m), sometime after departing Kansas City, Tomlinson changed his northeasterly heading more



Captain Tommy Tomlinson.

towards the east to intercept the storm. Later, upon approach to the storm from the west-southwest, Tomlinson steered the DC-1 into the environment of the outer fringes of the storm. Probing deeper into the storm, through the weak center of the eye, and finding little or no icing conditions at 27,000 feet (8230 m), Tomlinson turned the research plane towards the north and descended to 25,000 feet (7620 m). Once at 25,000 feet (7620 m), Tomlinson and his crew encountered severe turbulence and heavy precipitation. After a period of turbulent shaking and blinding torrential rain (*and obviously no icing conditions*) Tomlinson was concerned about the integrity of the DC-1 airframe in such turbulent conditions and subsequently decided to abandon the flight test weather mission and seek out the nearest airfield for an immediate landing.

Knowing that his initial (*planned*) recovery airfield was towards the north (*at Newark, New Jersey*), Tomlinson maneuvered the DC-1 through the hurricane conditions as best he could (*on instruments*) to lessen the strain on the aircraft's airframe structure. Still within the environment of the storm, the decent and approach to Newark was conducted in severe conditions with ceiling and visibility below minimums for landing. As Tomlinson touched down, it became instantly apparent that the airport was flooded from torrential rainfall, that at one point saw between 2-3 inches (50.8 – 76.2 mm) of rain fall within 1-hour.

In fact, the highest rainfall amounts seen during the entire track of the Labor Day Hurricane occurred in Maryland and New Jersey. Between 17.7 inches (420 mm) in Maryland and 13.4 inches (340 mm) in nearby Atlantic City, New Jersey.

In the end, this hurricane flight and other TWA meteorological research missions lead to the development of



Major James B. Baker (circa 1945).

procedures to maintain steady altitudes, a steady angle of attack and consistent air speeds (*at speeds 25 % less than normal cursing speeds*) when flying into severe weather and tropical cyclones.

Again, not well understood within the public domain and the perceived history of hurricane hunters and hurricane hunting, this meteorological research flight into a hurricane would not be the last time TWA aircraft would fly into hurricanes on meteorological research projects.

### **Maj. James B. Baker Flight (1942)**

In mid-1942, a USAAF Pilot & Meteorologist named "*James B. Baker*" is said to have flown into a hurricane off the coast of Puerto Rico.

In June 1942, (*then*) Capt. James Baker was the Commanding Officer of the 6th Weather Squadron, headquartered in Natal Brazil. In this position, Baker and his staff were assigned with the establishment of a series of weather stations along the northern coast (*and eastern extremes*) of South America, in support of the U.S. Military's Southern Air Ferry Route through the Caribbean— which saw the movement of tactical combat (*war*) planes and transport aircraft from the United States, across the Caribbean Sea and southern Atlantic Ocean to Africa, and on to the other major theaters of war around the world.

Baker was a trained fighter pilot (1936) whom in 1940 was accepted into the meteorology course at MIT. After graduation, Baker became the senior base weather officer at France Field (*Panama*) and subsequent the commanding officer of the 6th Weather Squadron. Sometime during that early summer of 1942, Baker was notified that he would be promoted to Regional Weather Control Officer for



A USAAF B-18 Bolo Bomber, like the one said to have been flown by Major James Baker into a hurricane in 1942.

the 9th Weather Region's southern area (*also headquartered in Brazil*) – effective November – December 1942. In this capacity, Baker would oversee all weather stations and weather-related activities within the Caribbean and South Atlantic and would frequently travel within this region checking weather stations and monitoring weather operations associated with the southern route.

Thus, sometime between June 1 and July 6, 1942, it was said that Baker (*now a Major*) apparently flew into a hurricane off the coast of Puerto Rico in a B-18 Bolo medium bomber. Baker is said to have recorded observations within the storm, including heavy torrential rain, severe turbulent winds and a well-defined eye. It's believed that the storm data collected during Baker's flight would have been communicated to all the various weather stations within the Caribbean and figured into any early AAF hurricane forecast for this storm.

Unfortunately, despite Baker's background, the importance of the command positions he held (*and would hold*), his general character and subsequent career expertise as a weatherman (*that conceivably should give credence to his claim*), there are no official records or reports of this hurricane reconnaissance flight found in U.S. Air Force's AAF weather service archives (*to date*) to confirm this flight.

Additionally, there is no record of a hurricane or tropical storm occurring during the specific period established for this flight – near Puerto Rico. There are records of a tropical storm/ hurricane later in September 1942, whereby a storm passed to the south of Puerto Rico between September 15-23, 1942.

To follow Maj. Baker's career further, in July 1943, the 9th Weather Region's southern area was split-off and established as a stand-alone command designated the 22nd Weather Squadron/Region. Baker was promoted to Lt. Colonel and became the Commanding Officer of this unit, based in Natal, Brazil. By the fall of 1944, (*full*) Col. Baker was subsequently promoted to Commanding Officer of the 2nd Weather Reconnaissance Squadron (*Medium*). He formed this unit from scratch and eventually deployed it to the China, Burma, India (*CBI*) theater of operations later in 1944. Baker's squadron provided vital weather information supporting 10th Weather (*Squadron*) Region forecasts for B-29 bomb strikes on Japan from bases in China and later for the infamous transport flights over the "*Hump*" the Himalayan mountains between India and China. He would eventually assume the Commanding Of-

ficer duties of the 10th Weather Region in the latter months of the war.

It was while Baker was the commanding officer of the 2nd Weather Reconnaissance Squadron, that squadron B-25 weather reconnaissance aircraft flew pioneering tropical cyclone reconnaissance flights out into the Bay of Bengal and the Indian Ocean, in support of the 10th Weather Region's storm warning and forecast center in India.

After the war, Baker moved up to the Headquarters Command of the USAAF's /USAF's Air Weather Service. As head of the USAF Air Weather Service's Reconnaissance Branch, Baker helped to develop and improve the Air Weather Service that conducted world-wide weather reconnaissance operations, typhoon and hurricane reconnaissance and special operations weather prediction capabilities. He eventually retired in a senior position of the 2102nd Air Weather Group, supporting the weather needs of the USAF's Tactical Air Command.

Given Baker's vast experience and being in a senior position to have conducted this early intentional, hurricane reconnaissance flight, there is again little substantive evidence, beyond unsubstantiated hearsay, to support confirmation of this hurricane flight. It is hoped that some concrete evidence will eventually avail itself to historians and resolve this outstanding issue.

Not to be remiss or to be historically inaccurate, there was one other early hurricane flight that occurred, ten years before Duckworth's 1943 flights out of Bryan Field, Texas.

### The 1933 EATS Hurricane flight

This earlier hurricane flight occurred over Washington D.C. during the 1933 Chesapeake- Potomac Hurricane (*August 13-25, 1933*).

This hurricane, having originated in an area well east of the Windward Islands, was first detected about 900 miles east of Puerto Rico on August 17, 1933, via several ship reports. By the next afternoon, the storm had developed quickly into a full-fledged hurricane and sped off towards the west - then later to the northeast. Nearing Bermuda, the storm tracked towards the west and took aim at the island, with the eye passing just southwest of its southern coast. The storm eventually made landfall along the U.S. east coast, passing inland just to the east of Cape Hatteras in the early hours of August 23. By 9 am that morning, the eye was passing just south of Norfolk, near Virginia Beach, Virginia, tracking to pass directly over Washington, DC.

During the hurricane's advance on Washington, an Eastern Air Transport Service (*EATS*) pilot, flying a Ford 5-AT-69 Tri-motor transport aircraft, on a long-range airmail flight between New York and Florida/New Orleans, approached Washington, having flown most of the way from New York on instruments through heavy rain squalls and turbulent conditions. With routine stops in Washington (*D.C.*), Greensboro (*North Carolina*), Atlanta (*Georgia*) and Miami (*Florida*), the EATS pilot flew through this storm (*through the eye*) to make an instrument approach



One of the EATS early Ford 5-AT Tri-motor transport aircraft, that was used to fly into the 1933 Chesapeake-Potomac Hurricane (circa 1933).

landing at the Washington-Hoover airport at the height of the storm - just before it closed due to flooding of upwards of three feet of water.

The Washington-Hoover Airfield no longer exists. It was located in Arlington (Virginia), near the 14th Street Bridge and the George Washington parkway, adjacent to the Potomac River. Established in 1926, the Washington-Hoover Airport comprised 142 acres that was bisected by a highway (the Military Road supporting the Army's Fort Myer Military Reservation) This area of Arlington was once part of the larger family estate of Confederate General Robert E. Lee. The airport proper was located at the foot of Arlington's 14th Street Bridge in a low-lying area of the tidal flood plain (wetlands water shed) of the Potomac River and subject to frequent flooding. The Military Road, and the Washington-Hoover Airport, were flooded under approximately three feet of water at the height of the 1933 hurricane. The Washington-Hoover Airfield was on the property that is now occupied by the Pentagon.

Accustomed to flying in all kinds of adverse weather and thunderstorms, the EATS pilot subsequently turned right-around and took off into the storm, after dropping off his local mail allotment, just before the airport was closed.

Although there are no records of the conditions the pilot encountered as he flew south from Washington, he did later arrive at Greensboro (North Carolina) and was welcomed by improving weather for his continued flight south to Florida.

What is very interesting about this particular hurricane flight, potentially the very first flight ever through the eye of a hurricane, is that the Eastern Air Transport pilot's name was *Joseph B. Duckworth!*

### Joseph B. Duckworth

Joseph Battersby Duckworth was born in September 1902 in Savannah, Georgia. After graduating from U.S. Army Air Corps pilot training in 1928, accepting a reserve officer's commission, Duckworth joined the Ford Motor Company (or the Stout Metal Airplane Division of Ford to be precise) in Detroit, Michigan - initially as a flight test pilot for Ford's AT Tri-Motor series of passenger and (cargo) transport aircraft. However, Duckworth was soon flying passengers (and the mail - later air freight) for Ford's new Air Transport Service - based on established air-mail



The Washington-Hoover Airfield, when it was positioned along the Potomac River (circa 1935). (Courtesy the Hagley Museum and Library, Delaware.)

routes between Detroit - Cleveland (Ohio); Detroit - Chicago (Illinois); and these destinations on to Buffalo (New York) in transport 4-AT Tri-motor planes. Between 1929-30, having left Ford, Duckworth moved over to the Curtiss - Wright Flying Services as a flight instructor at Curtiss-Wright's Goose Ile flying services facility, just down the river from Detroit, on Lake Eire.\*

Goose Ile (la Goose ile or Big Island) had a small airport built in the early 1920s, that came under the control of Curtiss-Wright in mid-1920s. This is where they trained seaplane pilots. By the mid-1930s, the U.S. Navy took over this airfield as a seaplane base and for training Airship crews.

Duckworth was the sole flight instructor there at Goose Ile until 1930, when he moved on to Eastern Air Transport Service or EATS. In actuality, Duckworth was promoted by Curtiss-Wright, and put in-charge of Curtiss-Wright's new passenger operations at Candler Field in Atlanta, Georgia, in 1930. However, Candler Field's passenger business was already dominated by Eastern Air Transport Service. It wasn't long before Duckworth jumped ship over to EATS at Candler Field.

Duckworth flew for Eastern Air Transport Service (later Eastern Air Lines in 1934) between 1930-1940. He began as an air-mail pilot, flying open cockpit air-mail planes, before being promoted to Captain, flying passengers and air-mail cargo / transport flights in various aircraft, including Ford's 4-AT and 5-AT Tri-motor transport airplanes.

During this period, when most early U.S. Air Transport Services were bidding for transcontinental routes (or international routes in the case of Pan American Airways) EATS / EAL instead focused on specific inter-east coast routes, transporting northeastern American passengers back and forth to sunny Florida. EATS / EAL also acquired U.S. Government air-mail contracts with air-routes up and down the U.S. east coast that often corresponded with subsequent passenger routes.

\* The Curtiss-Wright Flying Services' Flying School (division) provided all manner of pilot training courses (private pilot; commercial pilot; transport pilot - that encompassed night flying / blind flying training; and Seaplane pilot training) as well as ground maintenance and aircraft repair training.



An early EATS Ford Trimotor transport aircraft, like the ones Duckworth flew during his years with the company. And it may have been the one he flew into the Chesapeake-Potomac Hurricane in August 1933. (Courtesy Georgia State University archives.)

With this company, Duckworth was a single-engine (*open cockpit*) night air-mail flyer, an air-mail cargo transport pilot, a multi-engine rated air freight transport (*mostly flying air-mail cargo*) pilot and passenger transport captain. It was during this decade with EATS / EAL that Duckworth accumulated more than 10,000 flight hours that encompassed blind flying (*instrument flying*) at night and in severe weather of all kinds. It was this period of his flight career that provided him the expertise that would aid his future endeavors in WWII and after.

With the war in Europe escalating in 1940, and the U.S. government and military preparing for an eventual entry into the war, Duckworth (*a USAAC reserve Captain*) arbitrarily left his lucrative position with Eastern Air Lines and joined the USAAC as a regular commissioned officer – commissioned with the rank of Major. At this moment in time, Duckworth was 38-years old and had amassed approximately 12,000 flight hours.

It is unknown why Duckworth left his high paying job at Eastern Airlines, for the relatively lower pay as a AAF pilot / officer. Duckworth was actually 1-year older than the maximum draft age requirement (*18-37 years old*) to enter the U.S. Military – (*thus*) he was too old to be drafted. He was also too old to be assigned to a combat squadron and was never going to see front line aerial combat action when he joined. Had he stayed with Eastern Airlines, in his position as a senior airline pilot, he could have been assigned as a civilian pilot to the USAAF's Air Transport Command's Domestic Transport Division and flown all over the world as a contracted airline pilot with the AAF's ATC. Instead, he quit his Job with Eastern and joined the AAF directly.

So, with that many flight hours under his belt, it was not unexpected to find Duckworth assigned to the USAAF's multi-engine (*twin-engine bomber*) Flight Training School at Columbus Army Airfield, near Columbus, Mississippi by 1942. Subsequently promoted to Lt. Colonel, Duckworth was the Command [flight] Training Director to the Commanding Officer.



Lt. Col. Duckworth (*circa 1942*) as Command [flight] Training Director at the USAAF's multi-engine (*twin-engine bomber*) Flight Training School at Columbus Army Airfield, near Columbus, Mississippi.

It was here, under his position as Training Director, that Duckworth took the initiative to reduce training [flight] accidents (*one of the many issues plaguing USAAF flight operations*) and created a review board (*the Flying Evaluation Board*) specifically to evaluate and (*in some cases*) re-teach assigned flight instructors at this command – in an effort to reduce flying student training accidents. Between May and October 1942 under Duckworth's initiative, flying accidents at Columbus field were reduced by upwards of 44 percent.

There are public domain references (*including an internet article, circa 2020*) that suggests Duckworth also (*independently*) developed his signature flight instrument training concept there at Columbus and subsequently implemented elements of instrument flying concept at Columbus, garnering the interest of upper echelons of the AAF Air Training Command. And this interest subsequently led to Duckworth being posted as the commander of a dedicated flight instrument instructor training school in Texas in 1943 via Air Training Command. However, the reality of how Duckworth got to Bryan Field is a much different story. In fact, the truth of this issue surrounds General Henry "Hap" Arnold, Chief of the U.S. Army Air Force. You see; Joe Duckworth and Hap Arnold knew each other well before WWII.

With the United States entry into WWII in December 1941, Hap Arnold became a little busy positioning the AAF for war and lost track of Duckworth. Later in 1942, when the high rate of non-combat aircraft accidents and loss reports crossed Hap Arnold's desk, he remembered Duckworth's instrument flying concepts. Arnold had heard that



General Henry H. "Hap" Arnold, Commanding General of the U.S. Army Air Forces during WWII.

Duckworth had joined the AAC in 1940 and requested the U.S. Army staff personnel office to locate Duckworth ASAP. Once he was found, and assigned to the flight training school at Columbus Field, General Arnold made a special trip to Columbus to visit Duckworth in April 1942. After reacquainting, Arnold offered Duckworth a new job.

Before Arnold left Columbus Field, Duckworth's commanding officer was informed that Duckworth was going to be assigned to a special project and that he would be working on independently there. Arnold directed Duckworth to essentially write a new USAAF regulation establishing instrument flight rules for Army Pilots – that Arnold would later push through AAF Command for approval.

If not mentioned before, it was against U.S. Army (*Air Forces*) regulations for a pilot to willingly or intentionally fly into severe weather of any kind, endangering the crew and or the aircraft, before and during WWII. This regulation also figures into the perception -vs- reality of history associated with the public domain version of Duckworth's 1943 hurricane flights.

Later in the fall of 1942, when Duckworth had completed writing the new Army Air Force instrument flight regulation, Arnold assigned Duckworth to now write the instrument flight (*training*) procedures manual, and an instrument flight training curriculum – to provide for the training of pilots in instrument flying. Completed by the end of 1942, it was Hap Arnold that set Duckworth up at Bryan Field in Texas to teach flight instructors in the art and science of instrument flying. The plan was for these trained instrument flight instructors to go on to training AAF pilots at primary and advance flight schools as well as combat pilots in the various theaters of war, at the squadron level.

Its interesting to note; that it was Hap Arnold that set Duckworth up at the new airfield at Bryan Field. Having begun construction in January 1942, Bryan Field was originally slated to become an AAF Advanced, twin-engine, pilot school. But as it neared completion, Arnold grabbed control of the airfield and reassigned it to Duckworth and



The 1943 aerial photograph (*chart*) of the newly completed Bryan Army Airfield, near Bryan, Texas. (Courtesy of CHC / TAMU.)

his instrument flying school. Duckworth moved into Bryan Field in the early spring of 1943 and began to setup shop – officially dedicating the opening of the base on June 6, 1943.

With regards to the Duckworth story of the hurricane flights in 1943, many public domain references suggest that Duckworth failed to write a report on his flights due to the existing Army regulation restricting pilots from flying into severe weather. That he was afraid of getting in trouble with higher authorities.

The reality of this issue is that Duckworth "*did*" file a report on this hurricane flight, that was sent to his superior officer, and benefactor, Hap Arnold. The report itself was primarily focused on highlighting the flight as an instrument flight training opportunity for his students and steered away from anything benefitting meteorology or weather operations. Duckworth's Weather Officer, 1st Lt. William H. Jones –Burdick also wrote a report, highlighting the temperature (*thermal*) survey he conducted during his flight. This meteorological report was sent to Jones – Burdick's superior weather command at the 3rd Weather Squadron / Region (*Kelly Field, San Antonio, Texas*) who subsequently forwarded it on to AAF Weather Service Headquarters in Washington. In the end, nobody got in trouble for flying on that hurricane or for seemingly violating the Army severe weather regulation.

However, even if they had seemingly got in trouble for violating this regulation, there was another safeguard to protect Duckworth, and by default any of his passengers. When Hap Arnold assigned Duckworth to Bryan Field, he provided Duckworth with a "*flight-waiver*" that exempted him from the Army's severe weather regulation. Due to his unique flying experience and high-skills rate in instrument flying, he was more than capable of fly in any kind of weather.

The facts are that Duckworth flew his AT-6 every morning, in good weather or bad, when in command of Bryan Field. The morning of July 27, 1943 was no exception.

The aforementioned wavier given to Duckworth by Hap Arnold, is the genesis of the current IFR "*Green Card*". The



Bryan Field students and staff line up.

flight instrument (*rating*) Green Card denotes that the bearer (*a pilot*) has achieved high proficiency in instrument flying and is certified to fly in any kind of weather or low / no visibility conditions. Of course, it was Duckworth who received the USAF's very first Green Card; Green Card No. 1.

Under Duckworth's Command, the Bryan Field instrument flying instructors school taught more than 10,000 instrument flight instructors during WWII. This number of IFR trained pilots figured prominently in high-profile post-war operations like the Berlin Airlift and combat operations during the Korean conflict. Duckworth's concepts, manuals and procedures for instrument flying form the basis of modern Instrument Flight Rules training today in the U.S. Air Force. And why the Air Force considers Duckworth the father of modern-day U.S. Air Force Instrument Flight Training. There are various Air Force training facilities, base buildings and roads named after Joseph B. Duckworth scattered around the U.S. today.

Public domain references also suggest that like many WWII soldiers, sailors and airmen, Duckworth left military service and settled down to civilian life after the war. Duckworth it was said, left the AAF at the end of 1945 and subsequently became the director of the Safety Board (*Division*) of the Civil Aeronautics Board (CAB) / Civil Aeronautics Authority (CAA). But this is not historically accurate.

The reality is that Duckworth didn't leave the USAAF after the end of the war. In fact, Duckworth did not leave Bryan, Texas until the spring of 1946. Between the Spring of 1946 - early 1948, Duckworth served with the AAF in Washington, DC. But while stationed in the Washington, during this period, Duckworth became the (*military*) co-chairman of the "Radio Technical Committee for Avionics", an independent body supporting aviation safety. Under the RTCA, Duckworth helped develop and implement a plan for the establishment of a [civilian] Aviation (*Radio*) Navigation and [Air] Traffic Control System to facilitate safe and unlimited aircraft operations under all weather conditions. The origin of the Air Traffic Control system that world-wide aviation uses today.\*

This Air Traffic Control system developed by the RTCA went on to win the 1948 Collier Trophy, to improve the development of the airplane and advance the science of aeronautics. In this case, with respects towards improving the performance, efficiency and or the safety of air vehicles.

\* On June 26, 1947 Duckworth married his 2nd wife (Mildred Beilfuss) in Rockland, Maryland. Duckworth's first wife, Katherine Wadley Duckworth died March 11, 1945 in Bryan, Texas, from complications associated with a viral infection, leaving Joe and his three children to carry on by themselves until he married Mildred.



Lt Col. Duckworth explaining some finer points of glide slope characteristics.

Between 1948-49, now under the U.S. Air Force, Duckworth attended the National War College., a mandatory career step taken prior to the advancement to command officer (*and or staff officer*) positions within the U.S. Armed Forces Command Structure. NWC Courses presented encompass National Security Strategies and high-level policy guidance for all Command Officers.

Upon Graduation in 1949, Duckworth was assigned and served as the Chief of Flight Operations at Air Force Headquarters (*in Washington*) before moving on to become the Vice-Deputy Commander of the newly established Military Air Transport Service (*MATS*) headquartered at the time at Andrews AFB, in Morningside, Maryland.

On March 19, 1951, now Colonel Duckworth became the Wing Commander for the 1500th Air Transport Wing (*based at Hickam AFB, Hawaii*) and simultaneously the Base Commanding Officer of Hickam AFB itself. At this time, Hickam was principally a MATS command base in the Pacific region. In August 1952, the 1500th ATW became the 1500th Air Base Wing, with its administration separated from the Hickam base command administration, but was still commanded by the same Commanding Officer as Hickam AFB; Col. Duckworth.

However, on October 1, 1952, Col. Duckworth was relieved of his command(s), by Col. W.H. Higgins (*the previous 1951 1500th Wing and Hickam Base commander*) and transferred to the Tripler Regional Military Hospital in Honolulu for emergency medical treatment – associated with a circulatory ailment in one of his legs. Due to further complications, Duckworth was medevac'd back to the United States for further treatment on October 18, 1952. Duckworth would eventually sometime later have part of

one of his legs amputated and subsequently fitted with a prosthesis.

Thus, came the end of Joe Duckworth's illustrious military career, that saw him rise to the rank of Colonel, amass over 18,000 flight hours and subsequently become the father of the U.S. Air Force's instrument flight training command, all within about 13 years of military service. Although he was physically out of the military by the end of 1953, his medical discharge (*medical retirement*) wasn't issued until 1955. This later date is believed to have facilitated Veterans Administration disability eligibility for subsequent veterans' disability benefits.

After leaving Hawaii, the Duckworth family first appeared in Albion, Michigan (*Mildred's hometown*) in late 1952. While Mildred and some of the children moved in with family friends for a few months, Duckworth was admitted into Percy Jones General Hospital in nearby Battle Creek. Percy Jones, after WWII, was the largest military medical facility operated by the U.S. Army. This medical facility was especially created as a medical and surgical complex for amputations and the subsequent fitting of artificial prosthesis and physical rehabilitation.

With Veterans disability and (*the original*) G.I. Bill of benefits, Duckworth was able to buy a house in Albion, attend Albion College (*where he earned another degree, this time a master's degree in communications*) and later taught Speech there at Albion College. (*Some public domain references wrongly suggest that Duckworth taught "physics and or philosophy"*). Besides teaching, Duckworth was also an aviation consultant, having consulted for both the Flight Safety Division of the Guggenheim Foundation and for the Link Aviation Company.\*

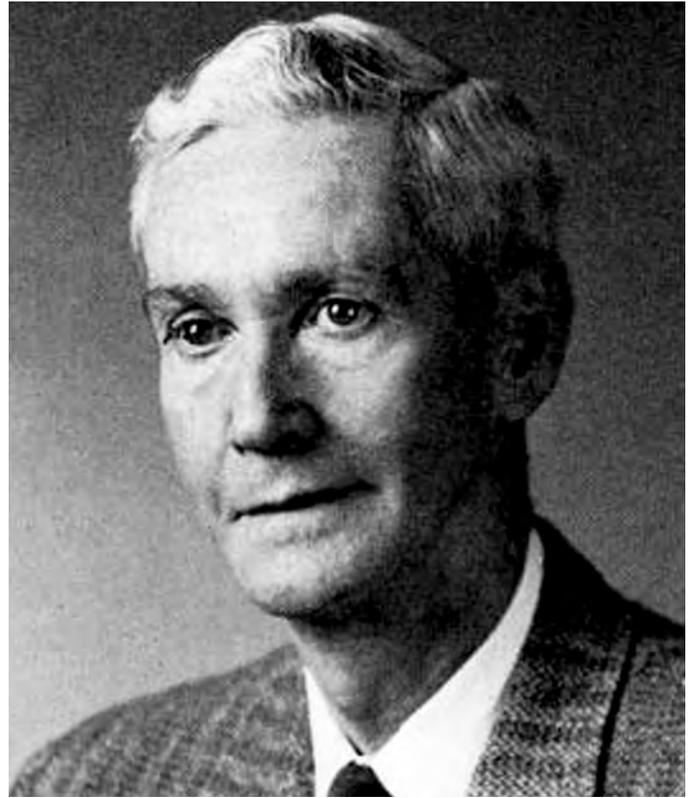
Additionally, Duckworth was also a writer/author, writing numerous articles, books, booklets and pamphlets for aviation publications and organizations associated with civilian instrument flying and air safety. And if that wasn't enough, Duckworth was a champion Bridge player and in 1963 opened a Bridge Salon (*studio*) in Albion, where interested parties could come to learn how to play Bridge for competition or just to play Bridge for fun.

Joseph B. Duckworth died on July 26, 1964 at age 61. Just one day short of the 21-year anniversary of his flights into the Surprise Hurricane of 1943.

So as one can see, this history of "*who was first*" to fly into a hurricane is much more comprehensive and convoluted than previously believed. This issue is further complicated by the lack of verifying archival documents that could provide an objective declaration of who among the six claimants was actually first.

Some might say that because Austin's and Povey's hurricane flights, as previously documented, never penetrated the eyewalls of their storms, they should be discounted. Baker, if his story could be independently verified, has

\* The Link Aviation Company (aka the General Precision Systems Company Ltd.) under the parent company "General Precision Equipment Corp, produced aircraft [flight] training simulators as well as related aircraft electronics and avionics.



Mr. Joseph B. Duckworth in 1958.

merit to be the first, because the motivation and composition of his flight was truly a hurricane reconnaissance flight – predicated along meteorological requirements. Some might recommend that, regardless of whether they flew into the eye of the storm or not, the first should be established by the date of the flight, i.e. Austin was the first. Subjectively, all of these early "*firsts hurricane flyers*" seemingly warrant a "*collective*" recognition as a group denoting some of the earliest known hurricane flights in history.

So, while you ponder this issue of who was first, newly revised hurricane hunting history provides for the notion of a series of "*firsts*": the first to fly into an Atlantic hurricane; the first to fly into a Pacific typhoon; and the first to fly into tropical cyclones (*in the context of the Indian Ocean, the South Western Pacific and elsewhere*); as well as the first (*non-American*) foreign country to have actively flown into tropical cyclones for reconnaissance, surveillance and research purposes since WWII. (*FYI: there are at least eight different countries now that have flown into tropical cyclones since WWII, with potentially another two nations on-deck, ready to begin hurricane hunting operations in the near future*).

With regards to Duckworth's 1943 hurricane flights having prompted official hurricane reconnaissance operations established in 1944, the public domain's references on this matter are woefully inaccurate and/or misconstrued. As previously stated above, the reality is that official hurricane reconnaissance flights in the Atlantic were initiated on July 14, 1943, by Frances W. Richelderfer, Chief of the U.S. Weather Bureau, with the aerial support of the U.S. Navy and USAAF. A component of this joint hurricane

reconnaissance operation was the establishment of the “*Joint Hurricane Warning Center*” (JHWC) in Miami, where both the U.S. Navy and USAAF hurricane forecast offices were co-located [in Miami] with the U.S. Weather Bureau hurricane forecast office.

There is a generally misconstrued understanding regarding the JHWC. Some public domain references infer that the three joint hurricane forecast offices were in one or the same location – within the U.S. Weather Bureau’s weather office in downtown Miami. The actual concept of the establishment of the JHWC was that the three organization’s hurricane forecasting offices would be co-located in the same city: Miami. The U.S. Navy’s Hurricane Weather Central – hurricane office was located at the Navy’s Fleet Weather Central (*Annex*) at NAS Miami (*later Masters Field and now the Miami-Opa Locka Executive Airport*). The USAAF’s Hurricane (*forecast*) Office was located at the Miami Army Airfield (*the previous Pan American 36th Street Airport that was taken over by the AAF’s Air Transport Command during WWII – and is now part of the Miami International Airport complex*). The two military hurricane offices were inter-connected to the U.S. Weather Bureau’s hurricane forecast office (*within the JHWC*) by a network of private Wx teletype machines. However, the U.S. Weather Bureau’s hurricane office (*and the JHWC*) was “*open*” to the AAF and Navy Hurricane Officers, where special forecast meetings and discussions were often held.

With the commencement of the JHWC’s operations on July 14, 1943, the hurricane center immediately began directing hurricane reconnaissance flights into suspected areas of tropical disturbance and tropical storms on this day and throughout the rest of July, and through the remaining months of the 1943 hurricane season in the Caribbean—mostly by Navy aircraft.

Having said that, “*in the Caribbean*”, is to denote that this was the immediate focus of JHWC’s hurricane reconnaissance operations in 1943. Although a long and convoluted story of how hurricane reconnaissance in the Atlantic got started and how reconnaissance assets were utilized, its sufficed to say that most of the hurricane reconnaissance flights in the 1943 hurricane season occurred in the Caribbean, flown mostly by U.S. Navy patrol aircraft assigned to regional command (*island*) bases of *Fleet Air Wing 11 (FAW-11)* under the authority of Commander, Caribbean Sea Frontier (*COMCARIBSEAFRON*) located at San Juan, Puerto Rico.

The AAF’s hurricane reconnaissance assets in 1943 were more widely dispersed and for the most part was conducted by random aircraft elements assigned to the AAF’s Air Transport Command (*ATC*) Caribbean Wing, through its command headquarters in West Palm Beach. Although some 1943 AAF hurricane reconnaissance flights were flown within the Caribbean, AAF hurricane reconnaissance operations were more or less responsible for the immediate southern approaches to the Continental United States in the western Atlantic. Given this initial criterion, hurricane reconnaissance in the Gulf of Mexico [in 1943] was not an immediate priority and this is why there were



The Joint Hurricane Warning Center’s representatives on the first day of operations July 14, 1943 and the initiation of official hurricane reconnaissance operations in the Atlantic. (Courtesy NOAA / NHC.)

no authorized or JHWC -directed hurricane reconnaissance flights into many of the season’s storms that tracked into the Gulf of Mexico.

At the end of the 1943 hurricane season, Weather Bureau Chief Richelderfer sponsored a hurricane conference, bring together all the hurricane reconnaissance commands, hurricane officers, aircraft reconnaissance weather officers and Weather Bureau personnel from the JHWC, to discuss the reconnaissance operations conducted during the season. Having had to compromise some of his desired elements towards the initiation of hurricane reconnaissance in the Atlantic, this conference provided Richelderfer an opportunity to claw-back some of those important elements. Of particular interest was his vision of dedicated hurricane reconnaissance units, with dedicated weather reconnaissance equipped aircraft and specially trained hurricane reconnaissance crews. He was somewhat successful in his endeavors, subsequently convincing the AAF to improve their hurricane reconnaissance operations for the up-coming 1944 hurricane season. The Navy maintained its reluctance to do the same, until 1945.

This important fact, that Duckworth’s flights did not prompt official hurricane reconnaissance operations in the Atlantic in 1944, coupled with the revelation that Duckworth was not the first to fly into a hurricane, should be enough to establish the perceived public domain version of the Duckworth 1943 hurricane flight story as flawed and historically inaccurate – but there’s more.

Given the knowledge (*now*) of Duckworth’s earlier 1933 hurricane flight, it seems evidently clear that “*if*” there truly had been a barroom bet on Duckworth’s first flight into the 1943 Surprise Hurricane, then it would have been “*a suckers bet*”, as Duckworth had flown into a hurricane before – knowing how to fly through such a storm and what to expect. More importantly, this understanding calls into question the whole issue “*if*” there was even a bet or dare at all.

## Origin of “the Bet”

Much time and effort has been expended on verification of this part of the version of the Duckworth story, that encompassed tracking down the origin of the bet–dare reference.

The so-called “bet” element of the Duckworth 1943 hurricane flight story is not original to the story itself. There is no mention of a “bet” in the first Texas newspaper accounts of the flight in October 1943. (*which were really made up of excerpts from Duckworth original August 19, 1943 hurricane flight report, entitled: “Flight Through a Tropical Hurricane”*) The bet component of the Duckworth story was also not mentioned in the November 1943 issue of the USWB’s *Monthly Weather Review*, (Vol. 71, No.11) where the U.S. Weather Bureau -Washington Office’s Howard C. Sumner was the first to write about the Duckworth flight in his monthly hurricane reports to meteorologists (*again based upon a copy of Duckworth’s August 1943 hurricane flight report*), nor is it mentioned in I.R. Tannehill’s “*The Hurricane Hunters*”, book published in September 1955.

It was Sumner that seemingly was the first to declare (*speculatively*) that Duckworth’s flight “.... *is the first time, to our knowledge, that a plane has been intentionally flown through the center of a hurricane.....*” albeit with no corroborative (*verification*) information beyond his own speculation. It was this comment (*reference*) by Sumner that allowed Tannehill to unequivocally declare “....*The first to fly into the vortex of a hurricane was Joseph B. Duckworth.....*” in his hurricane book, seemingly without any effort to verify the reference. (*FYI: in 1955 Tannehill had just retired from the U.S. Weather Bureau – Washington Headquarters, where he had been the Assistant Chief of Bureau for Operations.*)

In actuality, the first person to declare Duckworth’s flight to be the first into a hurricane was made in print by the editor of the Galveston Daily News in the October 17, 1943 issue. In an editorial prelude to the article on the Duckworth flight, the editor remarked “.... *for the first time, as far as he knows, an airplane flight was made over the center of a tropical hurricane.....*”. Given that this newspaper article was also based upon Duckworth’s August 19, 1943 hurricane flight report (*and no interview was conducted with Duckworth beforehand*) the same assumption was made without any tangible verification. Thus, without any effort towards facts-checking or verification by modern would-be historians or journalists, this assumption has transitioned into historical fact incorrectly.

Between 1955 -1963, there were numerous local and statewide Michigan newspaper articles written about Duckworth, that made mention to his 1943 hurricane flight. However, none of these newspaper articles (*seemingly based on interviews with Duckworth*) mentions the bet or any references to RAF pilots. *It’s interesting to note; that Duckworth had a number of opportunities to correct the record with regards to his flights in 1943 as having been the first, given that he had flown into a hurricane in 1933, and that his 1943 flights weren’t actually (his) first.* It’s also evident, despite the hype about being the first to fly into a

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## NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES OF 1943

By HOWARD C. SUMNER

(Weather Bureau, Washington, December 1943)

THE hurricane season of 1943, statistically near the average of the past several years, contributed two interesting and significant approaches for investigation. They came in connection with two of the most severe tropical storms of the year, the hurricane of July 25-28 that passed inland over the Houston-Galveston Bay area of Texas, and the intense hurricane of August 20-25 that passed northeast of the Lesser Antilles.

One was the unusual three-pronged pressure fall traced by the barograph pen at the Galveston city office during the passage of the July storm. A copy of the trace sheet is reproduced as figure 1. Many modified examples of these secondary pressure falls have been noticed in connection with the passage of other hurricanes, notably the New England hurricanes of 1935, but nothing as clear cut and symmetrical as this trace has been available for study.

The other feature, and one offering greater possibilities for research, involved flights through the two hurricanes by officers of the Army Air Corps. Flights through the earlier storm were made from the Instructor's School at Bryan Field, Tex. On the first flight Col. Joseph P. Duckworth was accompanied by Second Lt. Ralph M. O'Hair, navigator, and on the second trip by First Lt. William H. Jones-Burdick, a pilot weather officer. This is the first time, to our knowledge, that a plane has been intentionally flown through the center of a hurricane. The flights were made at altitudes between 4,000 and 9,000 feet. The following bird's-eye view description of the “eyes” of a hurricane is quoted from Colonel Duckworth's report:

As we broke into the “eye” at the storm we were, of course, calm, and could see the sun and the ground. Apparently the “eye” was like a landing cone as observation of the ground showed a conical shape.

At another point in his report, describing flight conditions, he said:

On the whole, neither flight through the hurricane was as uncomfortable as a good, rough thunderstorm. Rain had been encountered in the hurricane which was heavier than the rain in the hurricane, but my feeling of much more severe drafts and choppy sea bumpy air.

Later in the season observations were reported by Capt. Gordon H. MacDougall, Army Air Corps, during two flights through the hurricane of August 20-25. These flights were made from the island of Antigua, British West Indies, during the morning hours of the 20th and 21st of August. Various meteorological elements were observed and excellent cloud and swell observations were obtained.

Sea conditions observed within the storm area are described in this excerpt from his report:

For those of us who had spent enough time in the Caribbean to be familiar with the magnitude of the waves usually encountered, it was hard to believe what we saw below. The seas were tremendous

and the crests were being blown off in long points by a wind that must surely have exceeded 10 miles per hour. The long parallel streaks of foam streaming from sea were to another made it evident from which direction the wind was blowing.

Captain MacDougall reported that after pictures were taken an examination of the camera lens showed a salt residue from water droplets deposited at 1,000 feet.

To determine whether the natives possess any understanding of the precursory signs of an approaching hurricane, several natives were queried, with this result:

Our actual findings were that the natives were in all cases completely unaware of imminent danger. Twelve hours before the hurricane was to approach initially near the island we broadcast to the natives by means of a radio the names of most of the natives. Those of them said honestly, “I wasn't really my name.” The last we mentioned with, “No, it's the bloody rain that makes the wind this way.”

Below are descriptions of the individual storms taken in the main from station reports.

**Hurricane of July 25-28.**—The hurricane that passed inland over the Bolivar Peninsula, on the upper Texas coast during the early afternoon of July 27, was the most severe storm experienced in the Galveston Bay area since the hurricane of August 16-18, 1910. It was a storm of rather small area but unfortunately passed over the most densely populated and highly developed portion of the Texas coast.

A partial circulation aloft had been noticed over the extreme southeastern portion of the United States and the eastern Gulf of Mexico as early as July 25, but no disturbance was reported on the Mississippi Sound. The highest wind reported while the storm was moving westward south of the Delta was Barford force 7 (32-38 miles per hour), recorded at Barford.

During the next 3 days the disturbance increased rapidly in intensity and moving west-northward to the Texas coast passed inland over the Galveston Bay region, between noon and 1:00 p. m. (C. S. T.) July 27, as a small intense storm accompanied by full hurricane winds.

Galveston Airport recorded a maximum wind velocity of 74 m. p. h. and Houston Airport 85 m. p. h. while a gust of 104 m. p. h. was recorded on a slack displacement anemograph at Texas City. Other maximum wind velocities were: Fort Arthur, 54 m. p. h.; Galveston city office, 63 m. p. h.; extreme 68 m. p. h.; Ellington Field, 54 m. p. h.; and Houston city office, 69 m. p. h.

The main center of the storm was felt over almost the entire length of the Bolivar Peninsula and reports say its passage required about an hour. Since, at this point, the storm was moving 12 to 14 miles per hour

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Monthly Weather Review for November 1943; hurricanes page for 1943. (Courtesy AMS.)

hurricane, Duckworth (*while he was alive*) never included it in the list of achievements that he personally coveted. According to his family, his top career achievements that he was most proud of was as a commercial transport/air mail pilot, his contributions to instrument flying, and later flight safety, as well as his Bridge playing skills. The first to fly into a hurricane was never prevalent or at the forefront in his private persona while he was alive. Most of the accolades we see attributed to him today for his 1943 hurricane flight – fame came posthumously.

Before 1990, there are few if any published articles on Duckworth and his 1943 hurricane flights that include the bet or the RAF pilots' references. Even Dr. Robert C. “Bob” Sheets, then Director of the National Hurricane Center (1987 -1995), in his June 1990 article “*The National Hurricane Center – Past, Present, and Future*”, appearing in the American Meteorological Society’s “*Weather and Forecasting*” publication (Vol.5, No.2 – June 1990) does not mention any references toward the bet or RAF pilots, when talking about the Duckworth flights in 1943.

However, Sheet’s subsequent book “*Hurricane Watch*” (2002) with co-author Jack Williams, “*does*” mention the bet in discussions of the 1943 Duckworth flight and specifically presents details associated with British RAF pilots undergoing instrument [flight] training at Bryan Field, questioning the sturdiness (*airworthiness*) and reliability of the AT-6 Texan aircraft there.

The bet and RAF pilots’ references in this book are echoed by Jim Bell, from Houston Public Radio, that pro-

duced a radio hurricane series, that included the “1943 Surprise Hurricane” with discussion of the 1943 Duckworth flights. This 2007 radio production went on to mention the so-called bet with British RAF pilots undergoing training at the instrument flight school there in Bryan, Texas.

This 2007 Jim Bell radio show, hurricane series production, discussion of the Duckworth flights; also mentioned that Duckworth’s flight on July 27, 1943 led to the U.S. Military to initiate official hurricane reconnaissance flights in the Atlantic in 1944. This was one of the first times that this reference appeared in the public domain. Again, this Duckworth flight reference is not true and the continued perpetuation of this element of the Duckworth hurricane flight story borders on modern mythology.

From 2002 onwards, the 1943 Duckworth flight predicated on a bet raised by British RAF pilots at Bryan Field becomes a mainstay component of the Duckworth flight story in the public domain and starts to penetrate into meteorological literature as “historical fact” through mentions in technical articles by the likes of Dr. Bill Read, another Director of the National Hurricane Center (2008-2012). In May 2010, Read penned the article “the Surprise Hurricane of 1943”, with co-author Lew Fincher (a recognized free-lance hurricane consultant), that again perpetuates the mythical Duckworth story elements of the bet with RAF pilots.

This situation is further complicated by Fincher’s subsequent report that he interviewed Duckworth’s Navigator (passenger on the first flight) Ret. Lt. Col. Ralph M. O’Hair for the Surprise Hurricane article. According to O’Hair, the flight was made upon a “bet with British RAF pilots”, who questioned the airworthiness of the AAF AT-6 Texan Trainers. O’Hair is further quoted as having said the flight was based upon a bet, in other numerous public domain newspaper and magazine articles – prior to his death in December 2009.

Sometime between 2010 and today, thanks to the internet, Duckworth’s 1943 hurricane flight story has been exponentially proliferated across the international public domain, masquerading as historical fact. In recent years additional new story components have been added, transitioning the bet into a “dare” as well as other Duckworth story inaccuracies.

In an online blog, associated with NOAA’s Hurricane Research Division, entitled “27 July 2018; the 75th Anniversary of the first hurricane eye penetration” [references sourced not listed] stated:

..... by 1943 he [Duckworth] was commanding the instrument training facility at Bryan Army Air Field in Texas, teaching mostly British pilots how to fly on instruments. (It was Royal Air Force policy to fly their bombing missions at night to reduce casualties.) .....

This specific NOAA HRD blog inference, regarding the RAF historical element added into this latest version of the Duckworth 1943 hurricane flights (i.e. the RAF needing flight instrument training from Bryan Field, to enable them to fly their night bomber missions in Europe) is historically incorrect.



British RAF Link Trainer #1. (Courtesy RAF BFTS No. 1 Museum.)

The reality (of history) is that RAF Bomber Command aircraft were flying nighttime bombing missions over Europe long before the Bryan Field flight Instrument school was even thought of. The British pilots were able to fly those nighttime bombing missions because they “already had” instrument flight training.

Since the mid-1930s, the British RAF flight training regimen included instrument flight training. The British were very quick to embrace the new technology of the Link Aviation (synthetic) flight trainers, when they came on the market in the early 1930s. In fact, the British acquired a modified version of the Link AN-T-8 model that incorporated flight instruments (sync’d to the rotation of the aircraft in all three axes) to teach blind / instrument flying.

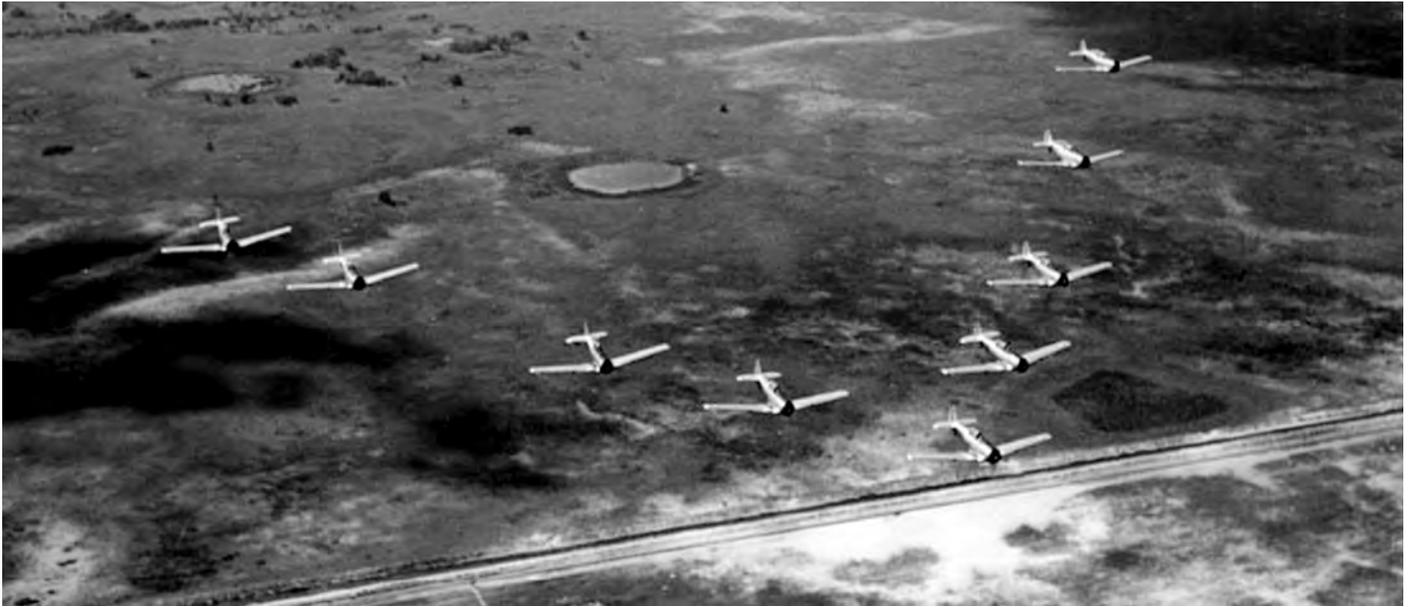
The RAF had utilized specialized [flight] instrument equipped Link flight trainers since 1934, when a Canadian Division of Link Aviation established a manufacturing facility in Gananoque, Ontario (Canada) specifically to provide specially modified versions of the instrumented Link Trainers to the Royal Canadian Air Force (RCAF) and the British RAF. Once the war started, these enhanced versions of the British (Canadian) flight instrumented Link Trainers were incorporated into WWII British RAF cadet flight training under a British flight training program conducted in North America.

Again; all British RAF pilots were trained in instrument flying before and during WWII.

Thus, any notions or references to so-called British RAF pilots, veterans of the Battle of Britain, said to have been at Bryan Field for instrument flight training is completely and historically inaccurate. By virtue of being veterans of the Battle of Britain, they would have already been instrument flight trained by the RAF itself and would not have required Duckworth’s instrument flight course to teach it to their pilot cadets.

### North American RAF Pilot Training

Besides the numerous USAAF flight training bases scattered around the U.S. in WWII, the British Govern-



RAF Students flying out of BFTS No.1, Terrell Field, Terrell, Texas, (circa 1944-45).

ment and the RAF (as an extension of their British Commonwealth Air Training Plan located throughout Canada) arranged for wartime flight (pilot) training to take place within the United States. Under a training scheme known as the “British Flight Training School program or BFTS”, this program sought to provide flight instruction to British RAF pilots cadets and aviator cadets from other British Commonwealth nations.

Due to wartime restrictions and other diplomatic policies, all BFTS flight training of British and / or commonwealth pilot cadets had to be conducted by contracted, commercial (civilian) flight instructors. One of the commercial aviation training companies under BFTS contract to train British RAF pilot cadets was Embry-Riddle (i.e. the Riddle-McKay Aero College; Riddle Field, Clewiston, Florida) Embry-Riddle maintained a number of contracted flight training facilities and airfields for the training of both USAAF and British RAF pilot cadets in the southern United States, three in Florida and one in Tennessee. (Embry-Riddle also maintained a flight training & aircraft maintenance school(s) in Brazil during the war) All manned by certified civilian flight instructors.

Under the BFTS program, seven flight training schools were established throughout southern and southwestern areas of the United States: including Terrell Field, (Terrell, Texas – aka BFTS No.1); Lancaster Field, (Lancaster, California – aka BFTS No.2); Spartan Field, (Miami, Oklahoma – aka BFTS No.3); Falcon Field, (Mesa, Arizona - aka BFTS No. 4); Riddle Field, (Clewiston, Florida – aka BFTS No.5); Darr Field, (Ponca City, Oklahoma – aka BFTS No.6) and Avenger Field, (Sweetwater, Texas - aka BFTS No. 7).

Avenger Field in Sweetwater Texas (BFTS No. 7) was established via a contract between the Canadian Government, in support of the British Commonwealth Air Training Plan (the RCAF engaged in training commonwealth RAF, RAAF, RNZAF and RAF volunteers from other countries) and the Plosser-Prince Air Academy – as part of the

BFTS program. However, the flight training school only existed between June – August 1942, time enough to graduate one class. By November 1942, BFTS training for the RAF was consolidated at Terrell Field / Terrell, Texas (BFTS No.1) and Riddle Field / Clewiston, Florida (BFTS No. 5). Avenger field was subsequently taken over by the AAF’s Air Training Command, retaining the previous BFTS civilian flight instructors to train other AAF pilots. General Hap Arnold retained these civilian instructors (under a new contract with Aviation Enterprises Inc.) to support one of his other pet projects, the flight training of the “Women’s Airforce Service Pilots or WASP pilots”. WASP training at Avenger Field began in January 1943 with civilian instructors.

Unlike the AAF flight training program, the BFTS flight training facilities conducted all basic, primary and advance flight training at the same airfields. AAF training command had all these elements of flight training conducted at different Airfields and or facilities around the US.

Not generally known is that the BFTS schools taught RAF pilot cadets instrument (blind) flying via specialized Link Aviation (synthetic) flight trainers modified for instrument flying training. The BFTS utilized a subsequent enhanced version of the British (Canadian) instrumented Link trainers incorporated into British RAF flight training under the BFTS program. With regards to BFTS flight training in Texas, BFTS No. 1 at Terrell Texas had the British variants of the instrumented Link flight trainers. All British RAF pilot cadets at BFTS No. 1 received instrument flight training there at Terrell Field.

Again; any British RAF “cadet” pilots undergoing flight training in the United States, and specifically in Texas, via the “British Flight Training School program or BFTS” would also “not” have been required to attend Duckworth’s instrument flight training school. BFTS airfields already taught instrument flight training to its RAF pilot cadets. They also would not have been allowed to attend Bryan Field for any kind of AAF flight training,



Graduation commencement for British RAF pilots at BFTS No. 5, Riddle Field, Clewiston, Florida. (circa 1944-45) (Courtesy of Embry-Riddle Aeronautical University)

due to the fact that there were no civilian flight instructors at Bryan Field – which under wartime diplomatic policies were required for the training British RAF personnel in the United States.

Thus, it's with this fuller understanding of WWII history, that one can see the small likelihood that British RAF pilots ever underwent flight training at Bryan Field. And if there were no RAF Pilots at Bryan Field, then there was no barroom bet or dare by which to predicate Duckworth's hurricane flights on July 27, 1943.

Ultimately, Duckworth's motivations to make his hurricane flights in July 1943 might just be for the reason he himself stipulated in his original August 19, 1943 hurricane flight report, that they were experimental instrument flying [demonstration] flights to impress upon his student instructors the importance of instrument flying – and nothing more than that.

Prior to the appearance of the bet or dare with British pilots' element of the Duckworth story, to suggest motivation for conducting the hurricane flights, public domain references suggested these Duckworth hurricane flights were made "on a lark" or "for fun". In an article published in the "Air Force Weather Historian" Quarterly Newsletter [magazine] (Vol. 1, No.3 Summer 2003) of the [US] Air Forces Weather History Office, William H. Jones-Burdick – the base weather officer that flew on the second Duckworth flight into the 1943 hurricane – is quoted as having said the flights were made on a lark.

So how or why were these (false) elements of the Duckworth 1943 hurricane flight story created (?) Was it just a matter of ignorance, misunderstanding of what actually happened on July 27, some 80 years ago (?) Or was it a deliberate fabrication made-up to add drama to the already misconstrued story, in order to sell books or benefit one's position somehow (?)

What's that old adage (a supposed quote attributed to William Randolph Hearst) ".....when presented with the truth and the myth; print the myth. It sells more newspapers! ....."

It's plausible that this RAF pilot "bet – later dare" component of the Duckworth story could have been a misinterpretation or mix-up, between Duckworth's operations at Bryan Field and the BFTS' RAF flight training conducted

at Terrell Field, Texas. The BFTS schools utilized AT-6 Texan training aircraft in their advance flight training phases and disgruntled RAF pilots might have voiced their misgivings as to the airworthiness of this particular aircraft, with these AT-6 comments somehow misinterpreted and / or attributed to Duckworth's school.

The historical reality however is the same, that the British RAF pilot bet – dare component of the Duckworth hurricane flight story, never happened!

There is another point to be stressed here, with regards to the Duckworth's 1943 hurricane flights. The situation is that the first thing that people will find when they stumble across the Duckworth hurricane flight story or explicitly hear on television, radio or read on internet at the beginning of each years' hurricane season, during hurricane reports, is the inaccurate, incorrect and misconstrued story posing as historical fact.

By now, given the proliferation of the Duckworth story across the internet in recent years, generations of people have been provided this false history. Even the U.S. Air Forces' (current) hurricane reconnaissance squadron, the "53rd Weather Reconnaissance Squadron" [the famous "Hurricane Hunters" ] tells the inaccurate version of the Duckworth 1943 hurricane flight story to the throngs of people and school children that parade through their WC-130J Hercules aircraft during airshows around the country and open-house days at their operating base at Keesler AFB (Biloxi, Mississippi). Not to mention the numerous U.S. Government websites such as the NOAA / National Weather Service webpages and related divisional webpages as well as the countless internet, online articles and pages that perpetuate the Duckworth story, that is now fast becoming (if it hasn't already) mythology.

In this age of "fake news" and "historical fiction" being accepted as historical fact, those times when the "truth" is readily known, it's important to point these facts out to correct the public's perception and place into the public domain the true history of these subjects, to set the record straight.

As the ancient scholars have lamented over the ages; there is a fundamental need to understand history, so as not to suffer the pains of repeating it. ■



RAF student pilots flying from BFTS No. 5, Riddle Field, Clewiston, Florida. (circa 1942).

**Fifth Generation Fighters: The World's Most Dangerous Combat Aircraft.** By David Baker. Horncastle, UK: Tempest, 2021. Pp. 267. Photographs. ISBN 978-1-911658-59-7

This is a revised issue of a book originally published in 2018, updated with the latest developments in the fast moving fifth-generation fighter field. David Baker is a prolific military aviation specialist who gathers much of his information firsthand at airshows and other venues. In this book, he covers the background and development of stealth technologies and the military and political impetus behind such programs. He also weighs the comparative costs and benefits that go into purchase decisions made by national leaders. There are discussions of the merits of the purchase of a mix of 4th- and 5th-generation fighters, and of the evolution curve of technology and tactics. For instance, stealth—both in aircraft as well as electronic design—is but one such characteristic. Many 5th gen fighters are networked nodes that receive, integrate, and send information to and from many sources. Fifth-gen technology is not confined to new-build aircraft. It can be fitted to fourth-generation aircraft as well, making them 4.5 or better.

This book is a great overall survey of the field of twenty-first-century fighter technology. It has chapters on such fifth-gen aircraft as F-22, F-35, MiG-35, Su-47, Su-57, J-20, FC-31, and even such upgraded fourth-gens (“4.5”) as the F-18E/F. The book ends with a review of 6th-gen programs, such as the USAF’s NGAD program and the UK’s Tempest. The book reads in some places like a marketing guide or a sales pitch, with capabilities and weapons described and illustrated. Baker has a deep and broad mastery of his subject, relating the political, economic, and technological story behind the development of these aircraft. His book assumes the reader is familiar with airpower concepts and technology jargon. Baker’s candid photos and loose, informal style often give the impression of standing at a rope line talking aircraft with a fellow technology buff.

The fifth-generation fighter is a popular topic. The Russian T-50/Su-57/PAK FA seems particularly popular, with two books by Hugh Harkins (2015 and 2021). Rajat Narang turned out a referential handbook on 4.5- and 5th-generation fighters in 2021. Yefim Gordon explored the Sukhoi S-37 and Mikoyan MFI (2002).

Baker feels comfortable enough with his topic to express opinions. The US is faulted for not pursuing adjustable jet engine exhaust, whereas Russian designs commonly employ it. He debates the merits of beyond-visual-range targeting versus in-close maneuverability. There is a lot of detail on weapons—bombs; air-to-air and air-to-ground missiles; and offensive and defensive electronic warfare systems, both podded and integrated. The book notes that fifth-generation technology can be more expensive to deploy and maintain throughout its life cycle

and debates the merits of the most cost-effective mix of fourth- and fifth-generation aircraft. Sometimes air forces will simply pursue a fourth-generation aircraft updated with some fifth-generation features hoping for an upgrade in capability without the overhead of a fifth-generation design.

I highly recommend this work for the reader who wants to know all about modern tactical aircraft programs and weapons, the nature of twenty-first-century air combat, and the politics of aircraft procurement.

*Steve Agoratus, Hamilton NJ*



**Ace In A Day: The Memoir of an Eighth Air Force Fighter Pilot In World War II.** By Lt Col Wayne K Blickenstaff. Philadelphia: Casemate, 2022. Photographs. Appendices. Index. Pp. 340. \$39.95 paperback. ISBN: 978-1-63624-209-5

“Blick” Blickenstaff is described as a “stalwart” of the 353rd Fighter Group. A founding member of the 350th Fighter Squadron, he rose from line pilot to group operations officer. He flew two combat tours in both the P-47 and P-51 and received credit for ten aerial victories, five of which occurred on one sortie.

The book started as a novel that included fictionalized events and names from real wartime experiences. Typically, the renamed people were involved in incidents that could embarrass them or their families. After Blick’s death in 2011, editor Graham Cross meticulously restored the real names and facts. His picture of Blickenstaff and others is detailed. Using a variety of sources, including Blick’s wartime journal, his narrative paints a story that is noteworthy for its humanity.

Blickenstaff struggled with early pilot training, having little confidence and being easily intimidated by instructors and the limitations of his aircraft’s performance. He describes a check-ride that involved basic maneuvers, including an S-turn using a road as a reference. He flew the maneuver successfully, but the evaluator complained that the maneuver was not sufficiently aggressive and that Blickenstaff failed to get the aircraft wings vertical in the turns. Angered and embarrassed, Blick reaccomplished the maneuver, violently throwing the trainer across the sky. A year later, his confidence had certainly returned. Blick found himself in the sights of two Bf 109s. He escaped his pursuers by flying a violent S-turn that the Luftwaffe pilots could not match.

The dust jacket notes describe Blick’s story as “honest and gritty.” It is all of that. He is the epitome of openness and honesty, especially when he talks about the nights he spent in Atlantic City awaiting his departure to begin his second combat tour. To say he had second thoughts is a massive understatement. And that wasn’t the only time

he bared his soul to the readers. His description of being lost and disoriented in heavy weather over England wasn't his only "Jesus, take the wheel" moment. While strafing a Luftwaffe airfield, he took a massive hit in his Mustang's wheelwell area. Did he stay with the plane or bail out? Did he crash-land at an emergency field on the coast or try to get home? When he got home, did he bail out or attempt to land with one main gear down and the other up and risk cartwheeling into a fireball?

In each of the above anecdotes, Blick's narrative is so simple, honest, and direct that the reader cannot help but be drawn into the story. His self-deprecating style could be unbelievable if not for the true heroism of his actions. Today, our society uses the term "heroic" to describe everything from first responders to sportsmen. But when you finish Blickenstaff's book, you will know what true heroism looks like.

I recommend this book without reservation. Regardless of Cross's somewhat heavy hand, Blickenstaff's honesty, bravery, and integrity shine through.

*Gary Connor, docent, Smithsonian National Air and Space Museum's Udvar Hazy Center*



**Tupolev Tu-22 Blinder: Supersonic Bomber, Attack, Maritime Patrol & Electronic Countermeasures Aircraft.** By Sergey Burdin and Alan Dawes. Barnsley UK: Pen and Sword Aviation, 2020. Tables. Diagrams. Illustrations. Photographs. Appendix. Pp. 269. \$28.95 paperback. ISBN: 978-1-5267-8341-7

For anyone interested in what has to be one of the most graceful-looking Soviet designs of the Cold War period, this is THE reference book. First published in 2005, this most recent edition provides the definitive story of the airplane's design, technical features, operations, and crew training. Burdin is a former Russian Air Force member who spent ten years amassing archival material and interviewing many former flight and maintenance personnel. Dawes, his British translator, is widely published in aviation magazines and has provided a very-readable narrative. In addition, he has added notes throughout that better explain Russian terms and also amplify some of Burdin's information.

This Tupolev design was the first Soviet supersonic bomber. *Blinder* was intended to be a great leap over the capabilities of its predecessor, the Tu-16 *Badger*. It was strictly a medium-bomber design that could carry both conventional and nuclear payloads. Even at that, its range proved to be disappointing in the beginning. Introduction of aerial refueling (hose and drogue) alleviated this problem somewhat. It ended up being built in about 20 different models with various roles and capabilities. One of these was a trainer version with a raised cockpit behind

the pilot's position similar to that in the SR-71 trainers.

Probably the most useful versions were those involved with reconnaissance. During *Blinder's* operational service period with the Soviet Air Force and Navy from 1961 through the mid-1990s, these aircraft were often used to shadow and photograph NATO naval units in the Black and Baltic Seas and elsewhere.

Crew training was initially a big problem. With only a single pilot in the three-man crew, there was a large drop-out rate of Tu-16 pilots who were used to having a co-pilot next to them in a far less complex aircraft. Like its US "counterpart," Convair's B-58 Hustler, the three crew sat in separate compartments. It turned out that Soviet fighter-bomber pilots made the transition to the *Blinder* much more easily.

The only Soviet combat use of Tu-22s was in 1988, when electronic-warfare aircraft covered the routes used during the Soviet withdrawal from Afghanistan. However, the only other countries whose air forces had *Blinders*—Libya and Iraq—did, indeed, get a lot of combat use out of their aircraft. Libya performed limited bombing missions during the Libya-Chad conflict of the early 1980s. But Iraq used them heavily during the Iran-Iraq War against both ground targets and tankers in the Red Sea.

Interestingly, a major chapter deals with a large number of accident and incident reports (a lot of these aircraft were lost in accidents)—something not often seen in books dealing with Soviet aviation.

While the content is excellent, the book is not without flaws. Pen and Sword missed when they listed an index in the table of contents, but it wasn't there. And there are two large notes, "need this picture" and "need replacement figure," both in captioned blank areas. Oops! Those gaffs aside, pilots will love the mission descriptions for their "in the cockpit" feel. Engineers will love the details of the aircraft and systems. This is your source book for Tupolev's Tu-22.

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



**F2H Banshee Units.** By Richard R. Burgess. Oxford and New York: Osprey Publishing, 2022. Illustrations. Photographs. Appendices. Bibliography. Index. Pp. 96. \$24.00 paperback. ISBN: 978-1-472846211

If you are at all familiar with Osprey books, you will know exactly what to expect with this volume in their Combat Aviation series. Rick Burgess does not disappoint. You'll find an overview of early US Navy carrier jets focusing on evolution of the Banshee from its forebear, the McDonnell FH Phantom (the original one, not the F-4 Phantom II). Burgess breaks down the war record of the F2H-2 in Korea by squadrons, in the order they were de-

ployed. This is followed by the deployment histories of the photoreconnaissance variants of the F2H-2. Another chapter covers the first night-fighter and nuclear-capable F2H-2 variants. A further chapter is devoted to operators of the substantially redesigned F2H-3 and -4 “Big Banjo” (a redesign that Burgess compares to the difference between the F/A-18C/D and F/A-18E/F in scope). Finally, the Canadian Navy and US Naval Reserve units that operated the F2H later in its career are also covered. Appendices cover carrier deployments by squadron, date, and assigned Air Wing.

As with all of the Osprey Combat Aircraft publications, this one contains many photographs (in both color and black and white) and superb illustrations by prolific Osprey illustrator Jim Laurier. This book certainly well covers one of the earliest of the Navy’s jet fighters and its contributions to the war in Korea.

*Jon Barrett, Volunteer Photographer / Researcher, National Air and Space Museum*



**Modern Taiwanese Air Power: The Republic of China Air Force Today.** By Roy Choo and Peter Ho. Vienna, Austria: Harpia Publishing, 2021. Illustrations. Maps. Photographs. Glossary. Bibliography. Pp. 94. \$31.95 paperback. ISBN: 978-1-950394-03-6

As tensions with the People’s Republic of China (PRC) have increased, this highly informative and well-illustrated monograph cannot be a timelier reference. From its opening pages, it is filled with interesting facts about the Republic of China (Taiwan) Air Force (ROCAF) and its operations and units. The rich assortment of photographs reinforce the narrative.

The ROCAF mission clearly highlights its criticality to the country’s survival in the event of a PRC assault on Taiwan. To meet its mission, the ROCAF maintains highly trained pilots and crews continually on combat air patrols (CAP) in response to PLAAF (People’s Republic of China Air Force) provocations. As well, it operates a highly sophisticated air surveillance network that includes a long-range Raytheon PAVE PAWS radar system. Operators using this can look thousands of kilometers into mainland China to provide both intelligence and early warning of missile and aircraft launches. The Air Force also operates anti-ballistic missile defenses, rounding out its role as the primary defender of Taiwan.

It is readily apparent that ROCAF fighter pilots have long been accustomed to flying combat air patrols, never knowing if and when the PLAAF will attempt to penetrate the island nation’s defenses. In past crises, they have engaged in air-to-air engagements with mainland China and have a history of incredible black operations conducted within the PRC during the Cold War.

The authors go beyond detailed descriptions of aviation assets to round out the current capabilities of the ROCAF. A highly sophisticated organization, it has continually upgraded to insure survivability in response to targeting by the PRC. Its capstone is the Joint Air Operations Center (JAOC). To enhance protection for its assets for rapid response it has hollowed out granite mountains, going deeply inside to park aircraft and support equipment. Complementing the very hard sheltering are numerous highway runways. Realizing that the PRC is fully aware of these runways, the ROCAF has highly capable rapid-repair teams trained to restore runways in hours and not days.

The ROCAF is always pursuing modernization and survivability. The threat from the PRC is real, and the mainland makes no secret of it. Because the ROC is totally dependent on its air force to survive, it pursues improvements in both its defensive capabilities and its ability to retaliate. Hence, it is armed with ballistic and cruise missiles to reach bases well inside the PRC.

The real challenge from the PRC is the overwhelming advantage it holds in its aircraft and, especially, its missile forces. Can the ROC survive an all-out assault? A November 2022 *New Yorker Magazine* article, citing current RAND wargaming, concludes that Taiwan cannot long survive alone. Hence, the United States and, possibly, Japan are game changers. Because of the importance of Taiwan to US security interests, the PRC must not miscalculate a US response. With that in mind, this monograph helps immensely in understanding the role of the ROCAF in the ongoing give-and-take between the PRC and Taiwan.

*John Cirafici, Milford DE*



**In the Claws of the Tomcat: US Navy F-14 Tomcats in Air Combat Against Iran and Iraq, 1987-2000.** By Tom Cooper. Warwick UK: Helion, 2021. Tables. Illustrations. Photographs. Notes. Glossary. Bibliography. Pp. 72. \$29.95. ISBN: 978-1-991311875-4

Helion is known for publishing large-format, soft-cover books covering a wide variety of subjects. Using the publisher’s own words, they offer books that feature “concise, incisive text, rare images and high quality colour artwork.” Having reviewed many of their publications over the years, I have to say their self-promotion is pretty much on the mark. This volume (one of the Middle East@War series) covers a relatively obscure aspect of naval air operations with a fair amount of detail and a focus that I doubt one can find anywhere but in an official history.

To say that Cooper is a prolific author is an understatement. An Austrian aerial warfare analyst and historian, he has written dozens of books (including many for

Helion) and over 1,000 articles. He also serves as the editor on five separate Helion @War series covering all corners of the globe and a variety of subjects. He seems to specialize in just these sorts of books. The consistent quality of his material shows this is a good thing.

The book's specificity makes it a work for the true Tomcat lover. It starts with a short discussion of the fleet-defense mission starting in the United States Navy in the 1930s, the culmination of which was development of the Tomcat as the ultimate interceptor. Armed with up to six of the enormous (for an air-to-air weapon) Phoenix missiles, the F-14 was intended to engage Soviet bombers long before they were able to fire their ship-killing missiles at the fleet. As it turns out, this mission was often practiced but—thankfully—never executed. The Tomcat's operational use in air-to-air combat was almost exclusively against other fighters. Cooper understands and discusses the actual opponents: MiG-23 *Flogger* and -25 *Foxbat* fighters, as well as the intended Tu-195 *Bear* and Tu-22 *Backfire* bombers. When he discusses combats between US Navy Tomcats and Middle Eastern opponents, he addresses tactics as well as equipment for both sides.

The book includes tables which list aircraft, weapons, units, bases. All photos are black-and-white, but there are color plates illustrating most of the aircraft discussed. There are good maps, some of which are in color. Cooper includes inset discussions of technical subjects dealing with such things as the impact and use of radar warning receiver gear, an Iranian Falcon jet armed with the French Exocet antiship missile, and the role of the EA-6B Prowler. He also presents an interesting discussion of a subject he refers to as soft kill—essentially airspace denial, where the Tomcat's mere presence was enough to scare off the opposition. At the end of the day, this book definitely fills a niche for the true aficionado of this great naval fighter.

*Golda Eldridge, Lt Col, USAF (Ret), EdD*



**The Allied Air Campaign Against Hitler's U-Boats: Victory in the Battle of the Atlantic.** By Timothy S. Good. Havertown PA: Pen and Sword Books, 2021. Photographs. Notes. Bibliography. Index. Pp. xii, 275. \$42.95. ISBN: 978-1-3990-9649-2

One lesson the island nation of Britain took from World War I was that the successful prosecution of a war would depend on their ability to successfully protect the shipping necessary to survive. In the Second World War, the air campaign prosecuted by the Allies was a key part of the effort to protect the necessary shipping. Good, who has an MA from the University of Durham and graduated from the Naval War College, has written “the first book-length study of the Allied air campaign against the German U-Boats in the Second World War” in an effort to

complete that picture.

Good has met his goal of a comprehensive study. He provides a short summation of a large number of aircraft-vs.-submarine actions. If a reader is interested in interactions between aircraft and U-boats, this is the book to read. If, however, one wants a more complete picture, this book falls short in a number of significant areas.

The book relies heavily on secondary sources. The only primary sources are RAF and Fleet Air Arm squadron operational histories. The narrative would have benefitted from tables illustrating aircraft ranges, flight durations, losses, and weapon loads as well as radar types and ranges. Good does mention the Mk 24 *Fido* torpedoes without a detailed explanation of their capabilities. The same applies to U-boat countermeasures to Allied search radars. An example is their Metox receivers. Another area that deserved particular mention and explanation was the contribution of operations research and its effects on weapon effectiveness, maintenance, and resource availability.

Good is in love with the B-24 in all of its versions and rightly illustrates how important the B-24 was in closing the mid-ocean gap. Although he hints that the early versions were not the answer to the U-boat problem, there is no complete explanation. He also does not discuss in detail the fight between Coastal Command and Bomber Command for resources. Other aspects of the fight between airplanes and U-boats, such as high frequency direction finding (HF/DF or Huff/Duff), and its use to provide search areas are little discussed either.

A comprehensive list of published sources is provided along with a detailed index. The index is especially helpful in that it contains listings of all U-boats; RAF, US Navy, and US Army Air Forces squadrons; and ships mentioned in the text.

Overall, Good set himself a high bar. As a listing of aircraft and U-boat encounters, his book delivers. However, as a source for the entirety of the U-boat war, there are a number of other sources such as Blair's 2-volume *Hitler's U-Boat War* and Carey's *Sighted Sub, Sank Same* and *U.S. Navy PB4Y-1 (B-24) Liberator Squadrons* that better provide the big picture.

*Al Mongeon, volunteer, National Air and Space Museum*



**Fly By Knights, Air Force A/B/RB-26 Air Commando Missions in the Vietnam War.** By Roger D. Graham, ed. Jefferson NC: McFarland and Co, Inc., 2022. Photographs. Diagrams. Maps. Index. Pp. xii, 278. \$39.95 paperback. ISBN: 978-1-4766-8680-6

Graham has put together a collection of interviews, official records, and documents of unit members and their loved ones assigned to the 609th Air Commando

Squadron, Nakhon Phanom Royal Thai AFB. Using the “Nimrod” call sign, they flew the A-26K Counter Invader. The book covers both combat and the home front.

As US involvement in Vietnam began, RB-, B-, and A-26s were used for missions over South Vietnam and Laos. However, by 1961, the USAF was searching for a plane that could better carry out operations against supply and troop movements on the Ho Chi Minh trail. B-26 accidents occurred during this period at Eglin AFB and during Farm Gate operations in South Vietnam. These caused USAF leaders to rethink how to make the A/B-26 more lethal in counter-insurgency operations. Forty planes were sent to On Mark Engineering in Van Nuys, California, for re-manufactured wings and upgrades to engines, propellers, brakes, and wing fuel tanks. The result was the A-26K Counter Invader.

This book is a true story, told by men who maintained and flew these planes on nightly combat missions. They are personal recollections of 37 pilots, navigators, maintenance and armament personnel, and—importantly—family members. Graham interviewed people who could describe, in detail, the unforgettable missions flown. They flew A-26s from 1966 to 1969—high stress, night, attack sorties in Operations Steel Tiger and Barrel Roll and along the Ho Chi Minh Trail. A-26Ks and their crews proved to be deadly truck killers. In 1966, for example, they accounted for 64 percent of the 195 trucks killed.

Graham gives the reader an insight into what life was like, night-after-night, in a unit dedicated to destroying enemy logistics capabilities. The unit’s personnel spent their entire tours in an environment where flashes of light triggered adrenaline. Lines of tracers flashed up from anti-aircraft artillery virtually every time they flew. The unit was awarded the Presidential Unit Citation for “extraordinary gallantry in connection with military operations in Southeast Asia.” The Nimrods received recognition as the best truck killers of the war.

The last three chapters of this book cover a wide range of topics—historical records, a listing of those killed, family reflections several decades after the war, and finding and restoring an A-26. Thanks to the A-26 Legacy Foundation, made up of a small group of sons and daughters of Nimrod crewmembers, the last airworthy aircraft of its type is now flying across the US. The mission of this aircraft is to fly in honor of the Nimrods, giving the public the opportunity to learn about their clandestine, but heroic, mission. In the family reflection section, there are seven stories that speak to the war’s impact on those left behind.

This is an accurate historical collection of remembrances by Nimrod combat crews, their training and combat missions, and their loved ones. It is a book worth reading.

*Joseph D. Yount, USAF (Ret), and docent, National Air & Space Museum*



**The United States Space Force and the Future of American Space Policy: Legal and Policy Implications.** By Jeremy Grunert. Leiden, Netherlands: Brill Nijhoff, 2022. Appendices. Bibliography. Index. Pp. xiv, 298. \$159.00. ISBN: 978-90-04-52312-8.

Major Grunert, Assistant Professor of Law at the US Air Force Academy, posits that with creation of the US Space Force (USSF), “the question of how past, current, and future activities in space will contribute to militarization and instability in outer space has once again come to the fore.” Are accusations that the United States, by creating a Space Force, is contributing to militarization and instability in outer space naïve or misguided? Is it dangerous for the US or any nation not to take steps to better protect its space assets and to prepare for conflict in outer space?

After reviewing, in analytical detail, how international treaties and other agreements—most dating from the 1960s and early 1970s—established an enduring commitment to peaceful uses of outer space, Grunert delivers a useful summary of the evolution of US space security policy from Eisenhower to Biden. He assesses the extent to which American space policy, over past decades, has adhered fundamentally to internationally accepted principles, despite the lack of definitional clarity in some of the 1967 Outer Space Treaty terminology. From the standpoint of international law, he concludes the United States has long had a wide range of acceptable options for space-based military—including warfighting—activities.

In his discussion of President Trump’s promulgation of Space Policy Directive 4 (SPD-4) and the subsequent establishment of the USSF, Grunert notes how the key priorities in SPD-4 “heavily emphasize American space superiority” but remain dedicated to the traditional outer space legal framework. Nonetheless, he acknowledges opposition to creation of the USSF and admits, “From a policy perspective, there are certainly grave consequences to increased space militarization and weaponization.” But he thinks it fair to question whether the United States is “causing the militarization of space or merely responding, along with other actors within the international system, to a natural—though tragic—development of a new domain.”

To explore more deeply whether the American quest for “space control” or “space superiority” makes space warfare inevitable, Grunert applies John Herz’s “security dilemma” concept. One state taking steps to increase its security can lead to uncertainty among other states, causing the latter to fear for their own security. Consequently, security-increasing measures by one might generate heightened tensions and even conflict with others—an outcome no party desires. Grunert explains how acceptance of international law during the Cold War years dampened the security dilemma, but he suggests the end of the Cold War prompted a significant re-examination of

international law and lessened its role in the behavior of nations. The spacefaring rise of China, smaller states, and private entities, he observes, has rendered behavior in outer space more anarchic.

While he admits outer space tensions between China and the US foreshadow the possibility of space warfare, Grunert does not view it as inevitable. He asserts that “the Space Force is at least at the moment framed squarely within the limits of existing international outer space law”. Furthermore, the more interconnected, globalized world of the twenty-first century makes it feasible to believe, as during the Cold War years, that “conflict in outer space could continue to be averted.” On the other hand, he cautions that “the cause-and-effect relationship between the United States’ perceived desires in outer space and other states’ reactions should not be discounted either.” The future remains uncertain.

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



### **The RAF Battle of Britain Fighter Pilot’s Kit Bag.**

By Mark Hillier. Barnsley UK: Frontline Books, 2018. Photographs. References. Bibliography. Pp. xi, 114. \$28.95. ISBN 978-1-47384-999-0

This book is a detailed description of equipment RAF crews wore just before and during the Battle of Britain (1939-1940). Hillier is an aviation enthusiast and collector who has a special interest in the Battle of Britain and aircrew personal equipment. The book is well-researched and includes an excellent, supportive collection of photographs. Hillier organizes his tour of aircrew flight gear from top to bottom: helmet, parachute, uniforms, down to boots. The photographs combine current-day pictures of surviving articles as well as period photos which identify various types.

The Battle of Britain era was a period of aviation transition. Aircraft went from open cockpit, fabric-covered, underpowered “crates” to slick, metal, high performance thoroughbreds in a few years. Aircrew personal equipment was forced to transition along with the aircraft. Because of wartime conditions, the transition was a bit ragged. This resulted in RAF pilot uniforms not quite being “uniform.” Regulations recognized potential equipment shortcomings and allowed for pilots to purchase non-government-issue items for personal use. Hillier gives good descriptions of equipment evolutions and the reasons why, along with some interesting anecdotes. Three interesting examples illustrate equipment trying to catch up with technology:

In open cockpits, goggles were a must, but not so much in a closed-cockpit fighter. Something as simple as the strap had to be redesigned to accommodate the new bulge of radio earphones in helmets. Comfort, sun pro-

tection, and distortion all resulted in individual personal preferences and a variety of goggles used in any given squadron.

Flying in service dress uniform (jacket, shirt, tie, trousers, and low-quarter shoes) vice the more traditional one-piece flight suit. Some pilots preferred the uniform (sometimes with a sheepskin jacket) because flight suits were bulky, hot, and heavy. The shirt and tie eventually gave way to turtleneck sweaters and silk scarves. Douglas Bader, the famous squadron leader who had lost both legs in a pre-war crash preferred the flight suit, since he could leave his artificial legs in the suit. Putting on his suit for a scramble was easier.

Many pilots preferred low-quarter shoes for the simple reason that issued boots fit loosely and tended to fall off during a bail out.

This book will most likely appeal to collectors and Battle of Britain buffs. It can be quite useful for getting minute details right. As an aviation artist, I can verify that, far too often, when posting an illustration on social media, no matter how obscure the aircraft, someone will find something to criticize regarding some technical detail in the image!

While the book is a fine compendium and fills a void in aviation history, it would have been much more enhanced with some conclusions. Hillier merely goes from his closing section on badges to an abrupt end. Though some discussion of manufacturers was included, a summary section might have resolved some lingering questions: Did reissued equipment always solve problems? How were equipment changes managed? Was the RAF system in place to resolve equipment problems adequate for wartime? Still, the book is an excellent resource for aviation historians, artists, and collectors.

*Lt Col Paul Jacobs, USAF (Ret), National Air & Space Museum docent*



### **Supermarine Southampton: The Flying Boat that Made R.J. Mitchell.**

By Jo Hillman and Colin Higgs. Barnsley UK: Air World Books, 2020. Map. Diagram. Illustration. Photographs. Index. Pp. 229. \$42.95. ISBN: 978-1-52678-494-0

Higgs is the author of several books on British aviation. Hillman works with him at his aviation history enterprise, A Flying History, which holds the Peter Keating and John Stroud photographic collections as well as numerous oral histories.

The Supermarine Southampton was the first post-World War I flying boat acquired by the Royal Air Force. Entering service in 1925, it was the second-longest serving

flying boat in the RAF inventory, trailing only the Short Sunderland. Primarily a picture book, this volume features more than 200 photographs.

The authors briefly discuss the emergence of Supermarine and the influence of R.J. Mitchell, best remembered for designing the Spitfire fighter. Before there was a Spitfire, however, Supermarine received its first mass-production order from the Royal Air Force for the Southampton.

Numerous construction photographs detail how the company built the Swan (essentially a prototype for the Southampton) and the Mark I with their wooden hulls. The more widely built Mark II featured a metal hull. Most of the Mark Is would eventually be converted to the Mark II configuration.

Six squadrons utilized the Southampton in the late 1920s and early 1930s before the type went out of service in 1935. The Seaplane Training Flight and the Felixstowe Development Flight also used Southamptons. On several occasions, the RAF showed off the Southampton by flying several aircraft in formation to various parts of the British Isles.

Without question, the Southampton's greatest claim to fame was a mass flight of four that flew 27,000 miles from Britain to Southeast Asia, Hong Kong, and Australia in 1927.

Argentina purchased eight Southamptons and continued to operate them until 1948, while the Royal Australian Air Force operated two. The Japanese navy acquired one, which later was used in civilian service. The Turkish navy obtained six Southamptons.

The Royal Air Force at various times modified six Southamptons for experimental purposes. Ultimately, the RAF would direct Supermarine to develop what initially was identified as the Mark IV, but in production this type was called the Scapa. It served from 1935 to 1939. Because of an aircraft shortage, Imperial Airways briefly used an RAF Southampton on the Baghdad mail run.

Readers familiar with Arcadia Publishing's *Images of Aviation* series will find this volume to be an up-scale version of that format. The text provides sufficient context, but there are considerably more photographs. The price, understandably, is about twice as much. This work is highly recommended to flying-boat specialists and, possibly, modelers as well.

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



**Jet: The Engine That Changed the World.** By Graham Hoyland. Stamford UK: Key Publishing, Ltd., 2022. Bibliography. Photographs. Illustrations. Pp. 288. \$34.95. ISBN 978-1-80282-253-3

Graham Hoyland is a best-selling author, mountaineer, sailor, and producer/director of adventure films.

He was the fifteenth Briton to climb Mount Everest and has circumnavigated the world by yacht. Hoyland is the author of *Merlin: The Power Behind the Spitfire, Mosquito and Lancaster* (2020), *YETI: An Abominable History* (2018), *Walking Through Spring* (2016), and *Last Hours on Everest* (2013). He has worked on science, ethnographic and natural history films, and on a BBC2 business series. He also currently writes for an online magazine dedicated to everything about Mount Everest.

Hoyland begins with describing the invention of the jet engine, a device which has had a profound social effect on the world. Commercial jet aircraft revolutionized travel, opening up every corner of the planet. Jet engines came on the scene just when conventional piston engines (with their thousands of jerking, reciprocating, and overheating components) had reached their physical limits. In a masterstroke of simplification, the jet engine replaced all of these with one major moving part!

The book's first chapters deal mainly with the efforts and tribulations of early engine inventors and developers Whittle, Ohain, and Griffith. These creative geniuses had to deal not only with new technologies but also with uninformed politicians. Hoyland goes on to describe early pairings of engines to aircraft by several nations at the end of World War II and the Korean War. He then switches to developing, testing, and using jet-powered aircraft. These aircraft of the late 1940s through the 1960s include the Comet, 707, British V-bombers, Concord, 747, B-52 (the Stratosaurus Rex), and others. Vignettes of normal operations and accidents, both military and civilian (including skyjacks) are sprinkled throughout the text. Hoyland even gives a nod to ground and sea applications of the jet engine.

This book is definitely slanted toward British involvement in jet engine and aircraft developmental progress. Who knew that the British were responsible for both centrifugal- and axial-flow compressor designs, delta-wing bombers, antilock brake systems, supersonic aircraft, the bypass turbofan, carbon-fiber fan blades, and even the atomic bomb? Hoyland, pointing at politicians during the past seven decades, laments the fact that never before in the history of technology was so much [British developed knowledge] given away by those who understand so little.

This book is an interesting read. It provides a quick overview of the need for, development of, and operation of jet engines and related aircraft, along with the technology's societal impact. While some in-depth technical descriptions are included, the book remains an easy read even for those uninitiated in aeronautical science. As this work contains no index, it is not an especially good reference book. The reader is advised to have a highlighter ready and to make notes in the margins!

*Frank Willingham, docent, National Air & Space Museum*



**Fallen Tigers: The Fate of America's Missing Airmen in China During World War II.** By Daniel Jackson. Lexington KY: University Press of Kentucky, 2021. Maps. Tables. Photographs. Notes. Appendices. Bibliography. Index. Pp. xx, 272. \$29.95. ISBN: 978-0-8131-8080-9

Jackson opens his introduction by stating that the book's purpose is to determine the true military and social dimensions of the American airmen lost during combat operations in World War II China. Over the course of 16 chronologically organized chapters, Jackson's clean, concise prose delivers an unsung story of cooperation and fraternity in wartime, between American airmen and the Chinese men and women who selflessly risked their lives to return the fallen tigers safely back to friendly forces.

Over the course of the war, American air power in China remained limited in scale compared to Army Air Forces operations in Europe or the Mediterranean. But to the Chinese citizen—whether communist or nationalist—American air operations provided a boost in morale through the irrefutable proof Japan had not won, and Chinese resistance continued. As Jackson emphasizes at multiple points, while underground organizations in Europe delivered only 25 percent of surviving downed airmen back to Allied control, over 90 percent of those who survived bailout in China returned to friendly territory, thanks to the largely unknown, selfless heroism of Chinese soldiers and civilians.

*Fallen Tigers* is accessible to a wide audience of readers, from students to seasoned scholars. While military and air power historians will gravitate to the book, Jackson deftly positions narrative vignettes and the air war in China and Southeast Asia within the wider strategic conflict between the Chinese, Japanese, and Americans while also including Thai and Vietnamese voices. His analysis is succinct and clearly integrated into his narrative, strengthening the overall manuscript. A fine selection of maps and photographs, together with helpful appendices, including a timeline from 1937 to 2019 and another on Chinese transliteration in the text, aid in comprehending the likely unfamiliar subject matter.

Jackson is a graduate of the USAF Academy with a major in military history and a minor in Chinese; *Fallen Tigers* is his third book relating to the war in China and the Fourteenth Air Force. He skillfully weaves together archival primary sources, oral histories, and correspondence with American and Chinese veterans and relatives, unpublished memoirs, and published secondary works. Key to the book is an incredible database Jackson constructed listing all 680 aircraft and 1832 airmen reported missing on missions over China, Indochina, and Thailand (freely available at <http://www.forgottensquadron.com>).

*Fallen Tigers* is a welcome and belated addition to the historiography of the Pacific War, especially in the field of English-language literature on the war in China and Southeast Asia. Perhaps most important of all, Jackson

places his history into contemporary American-Chinese relations. As he concludes, the shark-mouthed P-40 ultimately represents “something that transcends governments or politics: it is the symbol of cooperation and fraternity between ordinary Americans and Chinese. Both sides sacrificed—not for anything political or partisan but for the liberation of an oppressed people. This, more than anything, is the lesson we learn from the fate of America's missing airmen in China during World War II: two vastly different peoples came together to fight inhumanity and injustice.”

*Dr. Frank A. Blazich, Jr., Curator of Modern Military History, National Museum of American History*



**25 days to Aden: The Unknown Story of the Arabian Elite Forces at War** (pre-publication edition). By Michael Knights. London: Profile Books, 2022. Maps. Index. Pp. 220. \$21.99. ISBN: 978-1-80081510-0

This well-written book, rich in essential details and backdrop, brings to light so much about the effort to contain Iran's ever expanding sphere of influence in the Arabian peninsula and the separate struggle against Ben Laden's al Qaeda operations in Yemen. For the US, the al Qaeda threat was real. Americans in particular were targeted again and again by al Qaeda from Yemen. Two of the three team leaders who hijacked aircraft on 9-11 were Yemenis. The Navy's USS *Cole* and the USS *Sullivans* were on separate occasions attacked in Yemen's Aden harbor with 17 *Cole* sailors killed. Ben Laden's roots were Yemeni and one his most successful groups—Al Qaeda in the Arabian Peninsula (AQAP)—has been based in Yemen.

The book opens in 2015 with the complicated power struggles that had been ongoing for decades in Yemen. The Houthis—a Shia Muslim movement with a political agenda, and armed, trained, and advised by Iran's Quds Force—were rapidly advancing from their base in the north on Aden, the major city in the Sunni south and a very important port on the Arabian Sea. They had to be stopped. The question was, by whom? US Special Operations Command had a detachment based just north of the city to fight the AQAP. They were immediately evacuated rather than become entwined in the Yemeni civil war or complicate ongoing US-Iran nuclear negotiations. They returned only after fighting ended in Aden.

The Sunni states on the Gulf had been under threat by Iran since the Islamic Republic came into power and sought dominance over the Straits of Hormuz. Now, the Gulf states (Bahrain, Qatar, the United Arab Emirates (UAE), Kuwait, Oman, and Saudi Arabia) were about to be outflanked to their west by Iran, which was in a position in Yemen to dominate the southern approaches to the

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Suez Canal. The members of the Gulf Cooperation Council (GCC) agreed to aid Aden, but how?

This is what the book is primarily about. The following chapters describe a losing struggle by the resistance in Aden to stop the well-armed Houthis. Then, at a critical moment, members of the GCC and allies commenced an air campaign against the Houthis, emulating in many ways the Gulf War's air campaign. In fact, the coalition called their operation *Decisive Storm*. The UAE took the lead. They inserted special operation forces (SOF) to direct air strikes and, later, naval gunfire for greater effectiveness; and they had teams in eastern Yemen to combat AQAP. Equally impressive was the expertise of its CH-47 Chinook crews flying night insertion missions, its navy, and its C-17 aircrews maintaining an airbridge. The UAE's professional standards in mission planning and execution were equal to those of the US military. To follow the detailed narrative, Knights included a number of very useful maps.

Readers will appreciate the combat capabilities of the Gulf states—especially when they run the show. They will also understand a conflict on the Arabian Peninsula and, ultimately, better appreciate what it should mean to US policy makers. The UAE deputy supreme commander ordered his ground commander to end the war in 25 days—before the month of Ramadan ended. The UAE fully committed armor, troops, and equipment to that end.

*John Cirafici, Milford DE*



**Brotherhood of the Flying Coffin**, By Scott McGaugh, Oxford UK: Osprey Publishing, 2023. Illustrations. Glossary. Index. Bibliography. Notes. Pp. 288. \$30.00. ISBN: 978-1-47285294-6

McGaugh is a veteran journalist and published author of several other books. His stated intentions were to focus “more on the glider pilots’ experiences, rather than unit identifications and military orders of battle . . . Likewise, rank can become muddling at times. With few exceptions, glider pilots held a Flight Officer, 2nd Lieutenant or 1st Lieutenant rank . . . So, in the interest of clarity, I’ve included a documented rank reference generally in the first or second detailed combat inclusion and then ‘glider pilot’ thereafter.”

As McGaugh intended, this kind of focus on the glider pilots’ experiences rather than their organization ensured that the glider pilot’s voices are heard. However, I was sometimes confused as to who was saying what, and when and where it was being said. The book never clearly states that the glider pilots’ job after delivering the troops and materiel in their gliders was to somehow get out of the combat zone and find their way to some collection point to be returned to their bases for further missions, though it

was ultimately implied. Near the end of the book, there is a brief mention of *Operation Thursday* in Burma. Otherwise the book is completely focused on glider-pilot training in the US and operations in the European theater.

With these caveats, McGaugh gives a good picture of the chaos and confusion felt at the level of the person on the ground in a combat zone. While, as with many readers, I was familiar with the use of gliders in the invasion of Sicily, the Normandy invasion, and the crossing of the Rhine, their use in the relief of Bastogne was new to me. There were three missions. On 26 December 1944, one glider carried medicine and doctors and was an uneventful success. This was followed almost immediately by 10 gliders carrying gasoline, again an almost uneventful success. The way pilots were chosen for this mission was enlightening. An officer walked into the pilots’ bunk room and said, “Who needs flying time?” When an affirmative answer was received, the reply was, “Get your combat gear. Draw ammo and three days’ rations and report to the briefing room at 10 AM.” The final mission, with 50 gliders, was flown on 27 December. Because of bad planning abetted by poor communication, 29 did not reach their landing zone successfully.

This book achieves what it set out to do: give voice to World War II glider pilots. But it does so at the expense of some structure that would help the reader understand what the mission objectives were. The Bastogne section was very informative, because McGaugh presented at least as much about the mission and its objectives as he did on individual experiences.

*Brotherhood* is scheduled for a March 2023 release. I had a pre-publication edition without illustrations, index, or maps. I hope all will be included. The glossary and endnotes were quite good. This will be an interesting and informative book to read.

*Leslie C. Taylor, docent, Smithsonian’s National Air and Space Museum*



**The Origins of Surface-to-Air Guided Missile Technology: German Flak Rockets and the Onset of the Cold War**. By James Mills. Havertown PA: Casemate, 2022. Map. Tables. Illustrations. Diagrams. Photographs. Tables. Notes. Appendices. Glossary. Bibliography. Index. Pp. xvi, 247. \$34.95. ISBN: 9-781-63624-277-4

Mills, who recently earned his Ph.D. in history from Monash University in Melbourne, Australia, previously published two articles on how the Allies exploited German technology in the years immediately following the end of World War II. The first—“An Anglo-American intelligence operation in 1947 to recover guided guided-weapon technical documentation buried in Germany” co-authored with Graeme Johansen, an adjunct professor at Monash—ap-

peared in *Intelligence and National Security* in 2019. The second, “The transfer and exploitation of German air-to-air rocket and guided missile technology by the Western Allies after World War II,” appeared in *The International Journal for the History of Engineering & Technology* in 2020.

In his opening chapter, Mills reviews Germany’s development of anti-aircraft rockets and missiles during World War II. He points out that German scientists and engineers were several years ahead of the Allies. However, Germany’s diminishing resources as the war neared its conclusion prohibited the country from ever fielding an operational system, despite the claims of some Allied bomber crews. Chapter Two complements the first chapter by examining American and British progress in the field during the war.

Chapter Three details how various American and British intelligence officials discovered frequently hidden documents and also examined various test facilities, laboratories, and wind tunnels. At the same time, they began to interrogate German officials and ultimately relocate them to the host nation.

In the next three chapters, Mills discusses how the American, British, and French governments transferred and utilized the documents, research equipment, and knowledge of German personnel. Because of its far greater resources, the United States had a decided advantage in terms of quantity, if not quality. Not surprisingly, there was reasonably close cooperation between the Americans and British when it came to sharing information. However, both nations were somewhat reluctant, at least initially, to work with the French. By the late 1950s, US companies had triumphed; both the British and French militaries bought US systems.

Mills concludes by noting that, while the Germans contributed in many significant fields including aerodynamics, fuels, and engines, they trailed the Allies in electronics. This limited their missiles’ capabilities to accurately target enemy aircraft.

The three appendices cover German missile characteristics, key German scientists, and the Soviet Union’s efforts in this arena. By the late 1950s, the Soviets would deploy the S-75 (best known in the West as the SA-2), the missile that shot down two Lockheed U-2s during the Cold War and tormented American aircraft attacking North Vietnam in the 1960s and early 1970s.

For anyone with a serious interest in surface-to-air missile development, this is a must read and a worthy addition as a reference volume.

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



**Flights from Fassberg: How a German Town Built for War Became a Beacon of Peace.** By Wolfgang W. E.

Samuel. Jackson MS: University Press of Mississippi. 2021. Glossary. Index. Bibliography. Photographs. Illustrations. Pp. 233. \$28.75 paperback. ISBN: 978-1-49683364-8

I have read most of Samuel’s books, and I was happy to receive this latest work. While a bit formulaic, his works are a pleasure to read. His comfort with the English language is extraordinary for a non-native speaker. Samuel always builds his stories around his own experiences; his life has been so amazingly colorful that the stories and anecdotes flow easily. He conducted detailed interviews with folks who shared a particular experience or place to add variety and color. And he is lavish in his praise for his adopted country. *Flights From Fassberg* follows the recipe with one new ingredient: Samuel brings his humanity front and center.

The book follows Samuel through the end of the war in Europe. The reunification of his family and their harrowing journey out of the Russian Zone to the “safety” of the British Zone and the town of Fassberg. Samuel doesn’t pull any punches describing life under the Russians, where extrajudicial murder, rape, kidnapping, and hunger were the way of life. Life in Fassberg was initially difficult; hunger and the black market ruled everyone’s lives. He is not hesitant to share his fears and nightmares and is very honest in describing the plight of German women. Many were forced to consider themselves as chattel to be bargained to get scraps of food to feed their families and maybe themselves. Samuel’s mother was one of those women, and he tells her story with honesty and love. The moral dilemma he faced as a 12-year-old will make readers grateful that they weren’t in his shoes—shoes made from scraps of wood, plastic, and cut-up Luftwaffe tires.

Eventually the US Air Force came to Fassberg to support the Berlin Airlift. The Americans brought jobs, chewing gum, and stability. An American sergeant took an interest in Samuel’s mother. This presented a wide variety of opportunities for Samuel to learn and experience a world of plenty. The sergeant took him back to his shared quarters and introduced him to a hot shower for the first time. Samuel paints a fascinating picture of wonder and embarrassment. Germany is a bath culture not a shower culture, and it took him a moment to discover the wonder of a hot shower, even if taken while wearing underwear he was too embarrassed to remove. Later the sergeant was transferred to another base in Germany and asked Samuel’s mother to come with him, leaving Samuel to fend for himself and his elderly grandparents in the dead of winter. He uniquely conveys the fear he felt and the understanding that it was his mother’s chance to find a better future. Little did he know, but that future would include him and take him from a bakery apprenticeship to a USAF commission.

I really like this book. It shows a side of Samuel that he hinted at in earlier works. This story puts him and his

humanity at center stage. The vignettes on the Berlin Airlift (and especially his relationship with the “Candy Bomber,” Col Gail Halvorsen) contribute to the narrative, but they do not carry the emotional impact of the story Samuel tells about his “tweenaged” years.

*Gary Connor, docent, Smithsonian National Air and Space Museum’s Udvar Hazy Center*



**Kamikaze: Japan’s Last Bid for Victory.** By Adrian Stewart. Barnsley UK: Pen & Sword Aviation, 2020. Photographs. Diagrams. Maps. Bibliography. Pp. 262. \$35.00. ISBN: 978-1-52674-803-4

British author Adrian Stewart has written several books on World War II British naval and aviation warfare. His latest book well captures the ethos of pilots of the Imperial Japanese Naval Air Force known as *Kamikazes*. The overarching theme is his interpretation of events between Japanese and Allied forces. The introductory chapter describes Japan’s entry into World War II, opening with the first two *Kamikaze* (although not known as such at the time) attacks at Pearl Harbor: Lieutenant Suzuki flew his damaged *Val* dive bomber into the USS *Curtiss* (AV-4) but did not inflict serious damage. Later, Lieutenant Iida crashed his A6M *Zeke* fighter into an aircraft hangar, demolishing it.

After a brief narrative about feudal Japan and its extensive warlord conflicts, Stewart explains how the Way of the Warrior (*Bushido*) code emerged. Applying to all military ranks, it stressed duty and loyalty to the warrior’s Lord. “Death is lighter than a feather, while duty is weightier than a mountain” was the base for this code. The warrior who surrendered was considered dishonorable, and his family would suffer this as well. The *Bushido* code is one explanation as to why Japanese never surrendered, continued to fight, inflicted as many casualties as possible, and then committed suicide.

Stewart presents a history of the Pacific war in the background while describing the *Kamikaze* origins, development, and deployment. Throughout the book, he provides vivid details of all military forces (US, British, Australian, and Japanese) and their political leaders. Most of the *Kamikaze* attacks occurred during the battles of Leyte Gulf, Iwo Jima, and Okinawa. Fully one-third of his work in three separate chapters chronicles this final period of the Pacific war. The staunch fan of military history will find these passages of great interest.

Stewart’s writing style is a bit confusing. He illustrates how the *Kamikaze* corps arose and performed their jobs, then jumps to 12th-century feudal times, and then returns to the war’s last years. He focuses almost exclusively on propeller airplanes, with a very short mention of other vehicles used in suicide attacks (*Ohka* aircraft,

*Kaiten* torpedoes, and *Shin’y* speedboats). Vignette lengths vary from two paragraphs to ten-plus pages. Stewart quotes from many sources but generally does not cite specific pages, so it is not clear if he is taking creative license or using direct quotes. He extrapolates from this plethora of quotes to explain pilots’ behaviors (an arm-chair-psychology approach), illustrating the distinction between US and Japanese military motivations and actions. Some details about individuals and events are interesting but do not provide greater insights about this part of the war. His last chapter, however, provides a well written synthesis about the significance of the roles of the *Kamikazes* in World War II.

In general, this book is very professional in appearance; and its grammatical style, spelling, and photo captions are well done, without any errors or mistakes. The book uses high-quality paper and black-and-white photographs. The main sources are principally other history books, with few first-hand documents or citations. There is no index. The book should appeal to history enthusiasts who will appreciate the details about the *Kamikazes*. However, this level of detail may be too elaborate for the general reader to stay interested or engaged throughout the text.

*P. E. Simmons, Ph.D., docent, Smithsonian’s National Air & Space Museum*



#### PROSPECTIVE REVIEWERS

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

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### Lt. Gen. Nicholas B. Kehoe, III May 1943 - December 2022



Lt. Gen. Nicholas B. Kehoe III (USAF, Ret.), 79, of Falls Church passed away on December 18, 2022, after a year and a half-long battle with blood cancer. He handled it like he did everything, with a quiet strength, determined not to let it make his world any smaller. He will forever be remembered as an honorable, kind, and generous man; one who valued service, mentoring, and good character. To know Nick was to respect and admire him.

Nick is survived by Paula, his wife of 55 years; his daughters, Elizabeth Hartzler (Shane) and Jennifer Whyte (Mike) and his grandchildren, Jacob, Emma, and Rachel Hartzler, and Nathan and Katherine Whyte. His siblings, Mike Kehoe (Becky), Kathy Christopher, Patti Soike, Barbara Kehoe, Maureen Reiniger (Peter), Noel Perry (Keith), Nancy Sullivan, Gail Sullivan, Tommy Sullivan (Valerie), Jimmy Sullivan, Marianne Sullivan, and Paul Sullivan (Nora), as well as many nieces and nephews also survive him. He is reunited with his parents, his sister Chris Jones, and a host of good friends who went before.

Nick, the first child of Nicholas B. Kehoe Jr., his namesake, and Mary C. Kehoe Sullivan, was born at Langley AFB in Virginia. An Air Force family, they resided across the U.S. in 9 different states until they settled in Rochester, New York where Nick lived until

college. When Nick was 12 years old, his dad passed away. As the oldest of 14 children, he was a much looked up to older brother and father figure. He was a devoted son and the apple of his mother's eye.

Inspired by his father, Nick also chose a military path. He attended the U.S. Air Force Academy, graduating in 1966. Shortly thereafter he met his wife Paula and with her (and later his two daughters) by his side, he embarked upon a military career that was impressive by any standard. Highlights include two tours in Vietnam; time spent overseas in Germany at Ramstein AB and in England at the Royal Air Force War College and British Joint Warfare Wing; being Vice Wing Commander at Langley AFB and Wing Commander at Randolph AFB; Commanding the 19<sup>th</sup> Air Force; more overseas time in Belgium at Supreme Headquarters Allied Powers Europe and as the NATO Military Committee Deputy Chairman; and finally, acting as the USAF Inspector General. After 34 years of distinguished service, he went on to serve as the National Commander of the Order of Daedalians, as well as the President and CEO of the Congressional Medal of Honor Foundation. Both organizations were so important to him. He made an indelible mark on each of them and stayed involved in various ways even after he stopped working.

In retirement, Nick remained busy with his favorite causes and kept in touch with many people from his past. He spent a lot of time training to be a docent at the National Air and Space Museum, but sadly due to Covid and then declining health, never got a chance to give a tour. Running errands was part of his daily routine, as was spending time with his beloved pup, Cooper, who he spoiled with at least 4 walks a day and way too many scraps of people food. When he was home, Nick could most often be found in his office, hunched over his desk with his piles of paperwork, resting in his easy chair, or sitting in front of a TV tuned into the news or a sport. He loved sports of all kinds, both college and pro, and was an avid supporter of all the Washington teams. He was a faithful watcher of the nightly news, and he never went far without his newspaper, his sudoku puzzle, and his briefcase (affectionately referred to as the football by his family).

Though a good husband and Dad to be sure, he truly excelled at Grampy. He loved his grandchildren fiercely and his pride in each of them was evident. Every day before he left the house he would don a UVA, JMU, or UT baseball cap that he wore to represent each of their respective colleges. He supported their causes and whatever was important to them was important to him. He was a super fan in the stands locally and a regular at other events too and would fly to Texas in a flash to see a band concert or soccer game or just to visit. Nick loved his family, supported all of them in their endeavors, and until his last breath was worried about everyone else's welfare over his own.

Nick was easy to love, easy to be proud of, and the very best at staying humble and giving others a chance to shine. The interest he took in the people whose paths he crossed was extraordinary and he truly had a way of making others feel heard and important. He quietly taught lessons on how to give back in this great big world by just extending his warm friendly smile and his big, beautiful, kind heart. He will certainly be missed, but his legacy will live on in all who knew him.

# Coming Up



Compiled by  
George W. Cully

In light of the coronavirus pandemic, events listed here may not happen on the dates listed here, or at all. Be sure to check the schedules listed on the individual organization's web sites for the latest information.

### March 23-26, 2023

The **Society for Military History** will hold its 89th Annual Meeting at the Hilton San Diego Bayfront hotel in San Diego, California. For registration and other details as they become available, see the Society's website at Call for Papers | The Society for Military History (smh-hq.org).

### March 30 – April 2, 2023

The **Organization of American Historians** will gather for the first, in-person portion of its annual conference at the Westin Bonaventure Hotel in Los Angeles, California. A second, virtual session will take place on April 13-4 May. The theme of this year's event is "Confronting Crises: History for Uncertain Times." For registration and other attendance information, see the Organization's website at 2023 OAH Call for Proposals | OAH.

### April 12-15, 2023

The **National Council on Public History** will hold its first in-person gathering since 2019 in Atlanta, Georgia. For more information as it becomes available, see the Council's website at 2023 Annual Meeting | National Council on Public History (ncph.org)

### April 17-20, 2023

The **Space Foundation** will hold its annual Space Symposium at the Broadmoor Hotel in Colorado Springs, Colorado. For registration and other details, see the Foundation's website at 38th Space Symposium – April 17 – 20, 2023 – Join Us April 17 – 20, 2023.

### April 26-28, 2023

The **Army Aviation Association of America** will hold its annual convention and symposium in Nashville, Tennessee. For more information as it becomes available, see the Association's website at Home (quad-a.org).

### May 6-8, 2023

The **Association for Uncrewed Vehicle Systems International** will present Xponential 2023, its premier annual event. The theme of this year's gathering is "the Blueprint for Autonomy", and it will be held in Denver, Colorado. For details as they are announced, see the Association's website at Association for Uncrewed Vehicle Systems International - XPONEN-

TIAL 2023: Call for Presentations (secure-platform.com).

### June 7-9, 2023

The **Institute for Political History** and the **Arizona State University Center for American Institutions** will co-host a Policy History Conference in Columbus, Ohio. For registration and other details, see the Institute's website at Policy History Conferences | Journal of Policy History (asu.edu).

### August 14-18, 2023

The **International Committee for the History of Technology** will hold its annual meeting in Tallinn, Estonia. The theme of this year's meeting is "Interdependencies: From Local Microstories to Global Perspectives on the History of Technology." For registration and other information, see the Committee's website at Annual Meeting (icohtec.org).

### August 24-26, 2023

The **Tailhook Association** will hold its annual gathering at the Nugget Casino in Reno, Nevada. For additional information, see the Association's website at The Tailhook Association | Tailhook Education | United States.

### September 9-13, 2023

The **Air and Space Forces Association** will hold its annual National Convention and Symposium immediately followed by its annual Air, Space and Cyber Conference and Symposium at the Gaylord National Resort in National Harbor, Maryland. For registration and other information, see the Association's website at AFA National Convention | Air & Space Forces Association.

### September 15-19, 2023

The **Air Force Historical Foundation** will hold its Annual Symposium and Air and Space Museum Conference at the Hyatt Denver and Wings Over the Rockies Museum. Further information will be forthcoming at [www.afhistory.org/events/](http://www.afhistory.org/events/).

### September 27-30, 2023

The **Society of Experimental Test Pilots** will host its 67th annual Symposium and Banquet at the Grand Californian Hotel in Anaheim, California.

Additional information can be found at the Society's website at Annual Symposium & Banquet | Symposium/Meetings (setp.org).

### October 12-13, 2023

The **NASA History Office** and the **National Air & Space Museum** will jointly sponsor "Discover@30 and New Frontiers@20: a Symposium on NASA's Discover and New Frontiers" space exploration programs. This event will be held in Washington, D.C. +++ need details ++++

### October 25-27, 2023

The **American Astronautical Society** will host its 16th annual Wernher von Braun Memorial Symposium at the University of Alabama at Huntsville in Huntsville, Alabama. For more details as they become available, see the Society's website at Wernher von Braun Memorial Symposium | American Astronautical Society.

### October 25-29, 2023

The **Society for the History of Technology** will hold its annual meeting in Long Beach, California. For more details as they become available, see the Society's website at News – Society for the History of Technology (SHOT).

### November 9-12, 2023

The **History of Science Society** will hold its annual meeting in Portland, Oregon. For more details as they become available, see the Society's webpage at History of Science Society (hssonline.org).

### December 11-13, 2023

The **Association of Old Crows** will hold its 60th Annual Symposium and Convention at the Gaylord National Resort & Convention Center in National Harbor, Maryland. For more information, ping a Crow at AOC 2023 (crows.org).

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

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The other U.S. Air Force aircraft named after an actual person or group of people is the B-25 Mitchell. Manufactured by North American Aviation, the B-25 Mitchell was named as a tribute to Airpower advocate Billy Mitchell. The North American Aviation B-25 *Mitchell* was a twin engine, gull-winged medium bomber. Gull-winged refers to the *Mitchell*'s wings having a noticeable bend of the inner part of the wing between the fuselage and the engine. This results in the aircraft's wings resembling the wings of a seagull.

First flown in August of 1940, the B-25 served in every combat theater during World War II. The B-25 *Mitchell* was also the plane flown by the Doolittle Raiders on their historic mission. Ultimately over 9,800 of the versatile bomber, thus making it the most produced twin-engine combat aircraft during the war. The B-25 Mitchell would not retire from the Air Force until 1957.

Airpower advocate Billy Mitchell is often referred to as the "Father of the Air Force." Born in 1879, Billy Mitchell enlisted and later was later commissioned at the beginning of the Spanish-American War. The war ended before his unit made it to Cuba. Mitchell earned his Junior Military Aviator badge in 1917 while in France observing the war on the western front (World War I). After the United States entered the war, Mitchell would go on to lead a force of

1,481 aircraft during attacks on the St. Mihiel salient in 1918. After the war, in 1921, led the test aerial bombardment of the German battleship *Ostfriesland*, proving that capital ships could be sunk by airpower. In 1925, his comments regarding the crash of the U.S. Navy's airship *Shenandoah* resulted in his being found guilty at court-marshal. Rather than service the sentence of being suspended from the service for five years with half pay, Mitchell resigned his commission.

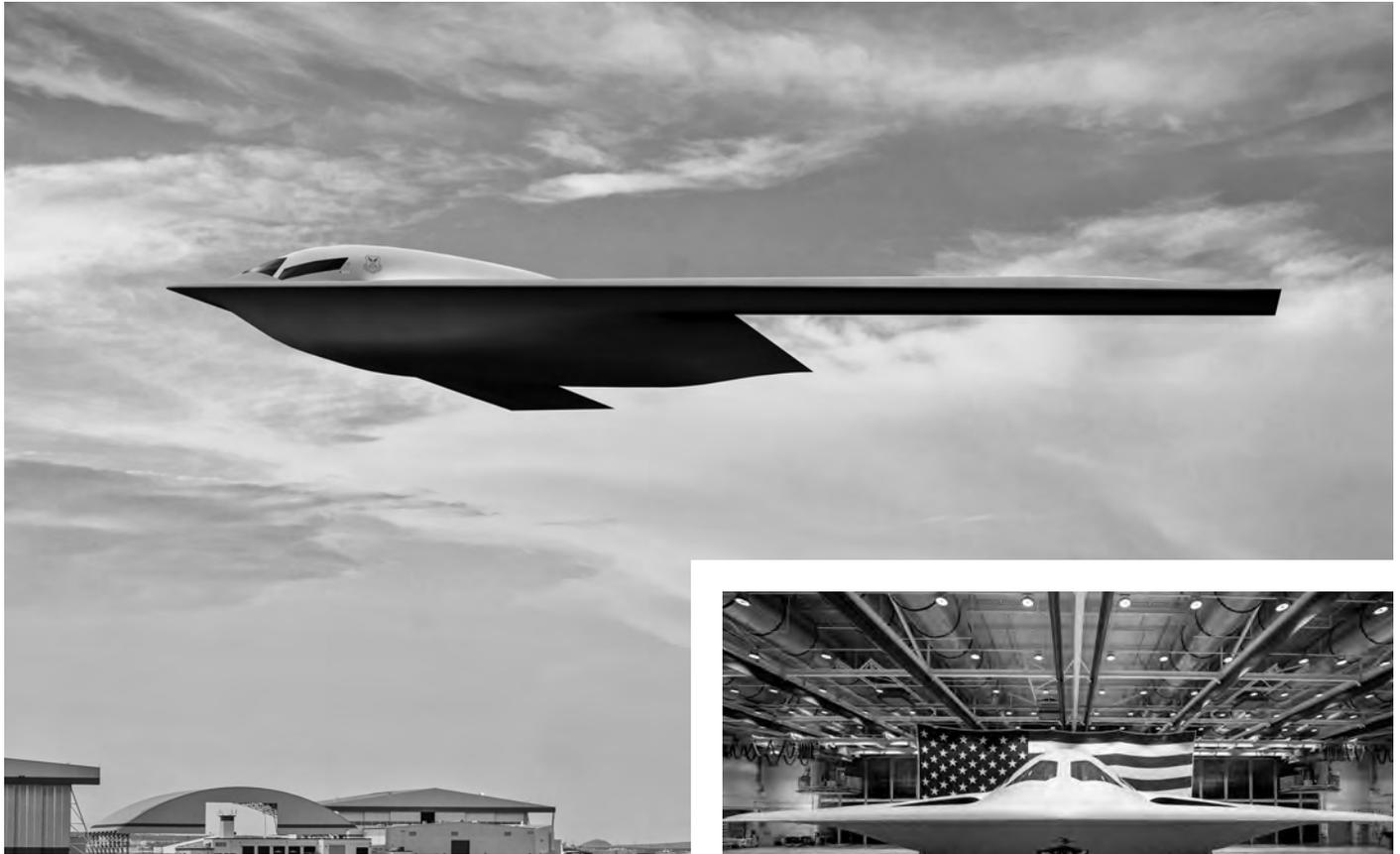
To learn more:

**B-21 Raider:** <https://www.af.mil/News/Article-Display/Article/3235250/b-21-raider-makes-public-debut-will-become-backbone-of-air-forces-bomber-fleet/>

**The Doolittle Raiders:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196211/doolittle-raid/>

**Billy Mitchell:** *Billy Mitchell: Stormy Petrel of the Air:* <https://media.defense.gov/2010/May/25/2001330275/-1/-1/0/AFD-100525-082.pdf>

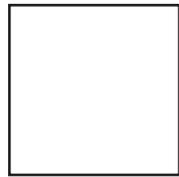
**B-25 Mitchell:** <https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196310/north-american-b-25b-mitchell/>



**This Issue's Quiz:** On April 18th, 1942, a group of airmen who became known as the Doolittle *Raiders* flew bomber aircraft from the deck of the aircraft carrier USS *Hornet* to bomb the Japanese mainland. Their surprise raid proved successful in both improving U.S. morale and striking a psychological blow to the Japanese. Eighty years later, on December 2nd, 2022, the U.S. Air Force publicly revealed the world's first fifth-generation bomber, the B-21 *Raider*. Manufactured by Northrup Grumman, the B-21 *Raider* is named as a tribute to the Doolittle *Raiders*. The name was selected as part of a contest to name the aircraft. The B-21 *Raider* is the second U.S. Air Force (this includes the Army Air Corps and U.S. Army Air Forces) aircraft to be named after an actual person or group of people. Can you name the first aircraft? If you need a hint, this aircraft has a linkage to the Doolittle *Raiders*.



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