

AIR POWER

SPRING 2016 - Volume 63, Number 1
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History





The Air Force *Historical* Foundation

Founded on May 27, 1953 by Gen Carl A. “Tooey” Spaatz and other air power pioneers, the Air Force Historical Foundation (AFHF) is a nonprofit tax exempt organization. It is dedicated to the preservation, perpetuation and appropriate publication of the history and traditions of American aviation, with emphasis on the U.S. Air Force, its predecessor organizations, and the men and women whose lives and dreams were devoted to flight. The Foundation serves all components of the United States Air Force—Active, Reserve and Air National Guard.

AFHF strives to make available to the public and today’s government planners and decision makers information that is relevant and informative about all aspects of air and space power. By doing so, the Foundation hopes to assure the nation profits from past experiences as it helps keep the U.S. Air Force the most modern and effective military force in the world.

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The Air Force Historical Foundation



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AIR POWER *History*

The Journal of the
Air Force Historical Foundation
Spring 2016 Volume 63 Number 1

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Air Power History (ISSN 1044-016X) is produced for Spring, Summer, Fall, and Winter by the Air Force Historical Foundation.

Prospective contributors should consult the **GUIDELINES FOR CONTRIBUTORS** at the back of this journal. Unsolicited manuscripts will be returned only on specific request. The Editor cannot accept responsibility for any damage to or loss of the manuscript. The Editor reserves the right to edit manuscripts and letters.

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Periodicals postage paid at Clinton, MD 20735 and additional mailing offices.

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

As Spring approaches, and the time for new beginnings, the Air Force Historical Foundation finds itself with a new Web site and email addresses. We are now www.afhistory.org. It's a simpler way to find the same great subject matter. The new email addresses are on page 2 (facing) and on page 61. Hope to see you and hear from you.

We have four articles this issue, starting with an article that won first place at the Air Force Academy. Adam Thomas has provided a story about the development of the modern British society in the ashes of the Battle of Britain. He links the survival of the United Kingdom in World War II with the replacement of the older, more stratified society. It was the best academic paper in the history department in 2015.

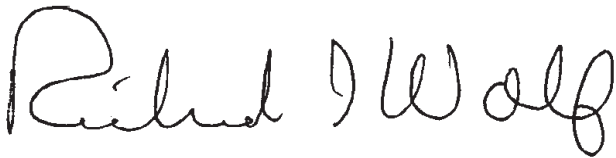
In the second of our four articles, we have A. D. Harvey providing a story of the RAF's flirtation with the P-39 Airacobra, when it was compared with the Spitfire in the early years of World War II. Of course, everyone knows the Spitfire won that contest, and the Airacobra went on to be highly regarded in the Soviet air forces. The P-39 was somewhat unique, with the engine location in the center of the aircraft, but it did not win out for the RAF.

Our third article moves to the modern era with a story by Forrest Marion about U.S. training for the Afghan Air Force. It is not often covered, since most Afghan military news seems to be ground-based, but the continued survival of Afghanistan as an independent nation will rely on air forces as well as ground forces.

Our final article, by Christopher Rein, is about the transformation in the utilization of observation aircraft in World War II, as the theories of how best to utilize observation aircraft becomes a new doctrine of tactical reconnaissance. It's a very interesting change.

Of course, we have our customary lot of book reviews once again, twenty-one in this issue, starting on page 46. We also continue to list upcoming events of an historical nature starting on page 58, reunion happenings on page 60, and we note the passing of a couple of notable figures from World War II on pages 62 and 63. As always, we finish up with our New History Mystery on page 64. A full and, we hope, a fascinating issue for you.

Our final note is more somber, as we mark the passing of a former President of the Air Force Historical Foundation, Gen. William Y. Smith (see page 4). From 1996 to 2003, General Smith led us through an uncertain time. He will be missed.



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General William Y. Smith, USAF (Ret.) (1925-2016)



General William Y. Smith passed away on January 16, 2016, at the age of 90. General Smith led the Foundation from 1996 to 2003, and remained a staunch supporter after he left office.

General Smith was born in 1925, in Hot Springs, Ark. After graduating from high school in 1943, He spent one year at Washington and Lee University Va., then entered the U.S. Military Academy at West Point, N.Y. He graduated in 1948, among the first academy graduates commissioned directly into the newly established Air Force.

His first assignment was training recruits at Lackland Air Force Base, Texas. Subsequently he went through flight training at Randolph Air Force Base, Texas, and Williams Air Force Base, Ariz., receiving his pilot wings in September 1949. He then served as a pilot with the 20th Fighter-Bomber Group at Shaw Air Force Base, S.C.

In March 1951 General Smith was assigned to the 27th Fighter Escort Group at Itazuke Air Base, Japan, and flew combat missions over Korea in F-84 Thunderjets. He spent two months as a forward air controller with the U.S. Army's 25th Infantry Division. He next joined the 49th Fighter-Bomber Group and served as operations officer for combat crew training at Itazuke, then as assistant group operations officer at Taegu Air Base, South Korea, flying combat missions until hit by flak and wounded on his 97th mission.

After prolonged hospitalization, General Smith attended Harvard University for graduate study, receiving an M.P.A. in 1954 and a Ph.D. in political economy and government in 1961. From

August 1954 to July 1958, the general taught government, economic and international relations, and attained the rank of associate professor at the U.S. Military Academy. He attended the Air Command and Staff College from August 1958 to June 1959. He spent that summer on special assignment with the president's committee to study the U.S. Military Assistance Program, the Draper Committee, then became a planning and programming officer with the deputy director of war plans in the Office of the Deputy Chief of Staff, Plans and Programs, Headquarters U.S. Air Force, Washington, D.C.

In July 1961, he moved to the White House as Air Force staff assistant to General Maxwell D. Taylor who was then military representative to President John F. Kennedy. When General Taylor became chairman of the Joint Chiefs of Staff in 1962, General Smith worked in a dual capacity as an assistant to the chairman, Joint Chiefs of Staff, and as a staff member on the National Security Council under McGeorge Bundy.

General Smith went to the National War College in August 1964 and after graduation in June 1965, was assigned to Headquarters U.S. Air Forces in Europe, Lindsey Air Station, Germany. He worked first in the Policy and Negotiations Division and later as chief, War Plans Division, both under the deputy chief of staff for operations. In July 1967 he became commander of the 603rd Air Base Wing at Sembach Air Base, Germany.

Following his return to the United States in July 1968, he became military assistant to the secretary of the Air Force, serving first with Secretary Harold Brown and subsequently with Secretary Robert C. Seamans Jr. In this position it was General Smith's job to advise and assist the secretary on matters of substance, particularly operational, budgetary, joint-service and system acquisition matters. In addition he carried out special projects for the secretary. He was appointed vice commander of the Oklahoma City Air Materiel Area, now the Oklahoma City Air Logistics Center in August 1971, and become commander in June 1972. The center provided logistics support for U.S. Air Force weapon systems that includes B-52s and associated missiles, A-7D's, C-135s and its configurations ranging from tankers to airborne command posts, command control communications systems, aircraft engines for Major Air Force combat and airlift aircraft, and component parts for various Air Force equipment.

In October 1973 General Smith transferred to Air Force headquarters and served as director of doctrine, concepts and objectives in the Office of the Deputy Chief of Staff, Plans and Operations. In July 1974 he was appointed director of policy plans and National Security Council affairs, Office of the Assistant Secretary of Defense for International Security Affairs. He became assistant to the chairman, Organization of the Joint Chiefs of Staff, in September 1975.

The general returned to Europe in July 1979, as chief of staff for Supreme Headquarters Allied Powers Europe, Belgium, and became deputy commander in chief, HQ European Command in June 1981. He retired July 31, 1983.

From the President

Dear Foundation Members and Friends:

What a difference a year makes! Your Foundation enters 2016 with the optimism of new possibilities. For the first time in years we have a substantial investment portfolio working for our organization. The funds have been prudently invested to provide a solid footing for growing our organization for years to come, enable us to not only pursue our mission of educating senior leaders and the public, and help expand our services and outreach.

But let's not kid ourselves, there remains much to be done. Non-profits, across-the-board, including ours, continue to have trouble gathering needed resources in today's tough economic environment. With the Board's continued leadership, we need your support with the following:



- First, we need to reach the break-even point for an annual budget in terms of expenses versus income—something that we've not accomplished for years. If we fail to do this, it's only a matter of time before we put our investment portfolio at risk and into a downward spiral. Due to the generosity of one of our long-term members, we've been given the opportunity that few organizations ever realize—a chance to reset our financial horizon and validate our long-term value to the Air Power community. In that vein, we must review our activities and member services, and establish new sources of income so that our Foundation remains vibrant, relevant, and financially sound.
- We must enhance our recognition throughout the greater Air Power community as THE source of its written history and heritage. We have learned over the years that, for most, to know us is to embrace our mission. While this has been accomplished to some degree over the years, too often we encounter those who should be aware of us say, "I never heard of you." As members, we all have a responsibility to promote our Foundation and to spread the word, to include using social media. If you do not already, or know someone who doesn't, anyone can follow us on Twitter at @AFHF, or Facebook at AF HistFound.
- Finally, our brand of "know the past, shape the future" is sacrosanct. Our success has been earned by the quality of our work and a well-deserved reputation for scholarly excellence. Let me share the words of one of our life members, as he described our journal, *Air Power History*:

"When poring through the past issues, one is both amazed and comforted that virtually every aspect of the Air Force has been covered: the people, the machines, the planning, the effort, the dollars spent, the failures, the successes. Carefully researched, peer reviewed, this literature stands the test of time. Absolutely unique among the service branches, it has earned its reputation as a repository of thought...."

As always, let me thank you for the part that each of you played in the history and legacy of Air Power, and for your support. It makes our role that much easier, knowing you stand behind us. This is your Foundation. We need to hear your comments and suggestions as we continue to grow in the coming New Year. "Come up on voice"—ANYTIME!

A handwritten signature in dark ink, reading "Dale W. Meyerrose". The signature is fluid and cursive, with a long horizontal line extending from the end.

Dale W. Meyerrose, Maj Gen, USAF (Ret.)
President and Chairman of the Board



From Depression to Victory: A Record of Growing British Determination during the Battle of Britain



Adam Thomas

(Overleaf) Observer Corps aircraft spotter on the roof of a building in London during the Battle of Britain, with St. Paul's Cathedral in the background.

EARLY IN
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If political measures do not succeed, England's will to resist will have to be broken by force" — German General Alfred Jodl, chief of the operations staff of the German armed forces high command.¹ Early in World War II, the Germans realized that Great Britain would not give in lightly and that the will of the British people would ultimately determine the fate of the British Isles. The German focus on the Giulio Douhet-inspired principle of bombing civilian centers meant they had to force the British people to lose their will to fight. This never actually happened, as the British came together with their staunch determination, which became the driving force behind their eventual victory in the conflict. At a low point during the unemployment-ridden, socially fragmented 1930s, the British peoples' morale grew as a result of the frequent, powerful speeches from Winston Churchill and from mundane, daily activities that diverted their minds away from the destruction around them. These factors, combined with faulty *Luftwaffe* tactics that focused on unsuccessful terror bombing, coupled with the growing ability of the British people to resist oppression and incredible odds, allowed for their survival and eventual victory in the Battle of Britain.

The *Luftwaffe*'s goal throughout its campaign against Britain was to break the will of the people so that they would give in without conflict on the ground. A prominent operational effort by the German air force was its employment of terror bombing.² The Germans based this idea on the early airpower advocate Giulio Douhet and his teachings on bombing strategy. The Germans knew that, in the coming aerial battle, "all of [Britain's] citizens will become combatants, since all of them will be exposed to the aerial offenses of the enemy. There will be no distinction any longer between soldiers and civilians."³ This means that the Germans were willing to bomb anything, as all of the British people were viable targets under the Douhet model. The Germans used this model in developmental planning for operational victory in the Battle of Britain; however, they underestimated how strong the will of the people would become in the months between the Battle's beginning in July 1940, and its suspension the following October.

Widespread unemployment started in Great Britain in the 1920s and grew more prevalent in the

Editor's Note: *This article is adapted from the prize-winning research paper of the same title that received the award granted to a cadet in the First Class (Senior) at the U.S. Air Force Academy who writes the "most significant research paper for the academic year contributing to an understanding of air power."*

Adam Thomas graduated from the U.S. Air Force Academy in May, 2015, and is currently stationed at Laughlin Air Force Base, Texas, awaiting pilot training. His father is an Air Force officer and his sister graduated from the Air Force Academy in 2013. His enthusiasm for focusing on the societal aspects of history came from his family's eleven military changes of station and he hopes to learn more about the people of the world in his beginning Air Force career.

1930s.⁴ Large cities such as Liverpool and Glasgow endured a "culture of poverty" that impeded their competition with cities that had more efficient working populations.⁵ The Pilgrim Trust, a national trust funded by American Edward Steven Harkness (a Rockefeller associate) that began only a few years earlier, encountered an underclass that counted their "series of failures" in getting a job by years.⁶ The dim outlook toward employment during the years before the *Luftwaffe* attacked, led to a widespread feeling of destitution among the British people. The first bombs that fell during the Battle of Britain instigated a "social reconstruction" of society in which people strove to improve the country and dig themselves out of their beleaguered state.⁷ The Battle of Britain put people to work and inspired their dedication toward Great Britain as a powerful and unified nation, a nation capable of defeating the German juggernaut at their doorstep.

The dim outlook toward the beginning of the war, due to the previous depression, recent French surrender, and apparent "dead minds and pro-Fascists" in British government, had to change if Britain was to have a chance against the Germans.⁸ British novelist and journalist George Orwell wrote diary entries nearly every day during the Battle of Britain, as well as during the period leading up to the conflict. The earlier diaries, recounting France's surrender and the resultant British lack of confidence in their own leaders, described a society that should not have won against the *Luftwaffe*. Commenting on the British outlook toward the war in these preliminary days, Orwell wrote, "Growing recognition that the only thing that would certainly right the situation is an unsuccessful invasion."⁹ Orwell, knowing that the British navy could keep out any attempted seaborne invasion from Germany, secretly hoped for the *Luftwaffe*'s arrival to the skies of Britain. Orwell continued by commenting on the political notion that "the London 'left' intelligentsia are now completely defeatist, look on the situation as hopeless and all but wish for surrender."¹⁰ Orwell's summary of British sentiment toward war derived from the mix of 1930s depression and the inevitable fact that the Germans were about to attack the British Isles.

Contrary to the bleak outlook held by Britons before the Battle of Britain, morale improved in the country once the *Luftwaffe* began its attacks. A member of Parliament during the time of the Second World War, Harold Nicolson wrote about the collective feeling toward war as a member of the upper tier of society.¹¹ Despite "pretty bad" bombings of ports in the British Isles, Nicolson described the morale of the people as "perfect."¹² He even described his own "cocky" outlook toward the whole

St Paul's Cathedral survives the London Blitz in this photo taken on December 29, 1940.



BRITISH
PEOPLE CONTRIBUTED TO
THE SURVIVAL OF THE
COUNTRY FROM THE
ONSET OF WORLD WAR
II THROUGH THEIR
MARITIME EFFORTS

war: in his view, there was no possible way Hitler's goal of a ground invasion the first weekend of the battle would conceivably happen.¹³ On July 20, ten days after the battle began, Nicolson states, "I think Hitler will probably invade us within the next few days.... We know that we are faced with a terrific invasion. We half-know that the odds are heavily against us."¹⁴ In these words, he seems worried about the impending mass invasion by the Germans, though his previous confidence shows through: "Yet there is a sort of exhilaration in the air But we are really proud to be the people who will not give way."¹⁵ Britons this early in the battle still suffered from the gloom of the 1930s, though Nicolson believed that the determination of the people grew with the notion that Britain would not fall.

The common British people contributed to the survival of the country from the onset of World War II through their maritime efforts. Before, during, and after the Battle of Britain, came the Battle of the Atlantic, during which British merchant vessels worked around the clock to deliver agricultural supplies to the people of the British Isles.¹⁶ The agricultural capacity of the British grew substantially in the early years of the war; there were increases from thirteen million cultivated acres to nineteen million in 1939, from 1.5 million to 1.9 million tractors employed from 1940 to 1943; and in agricultural yield, per acre, of thirteen percent from 1940 to 1942.¹⁷ British farmers could not keep up with the agricultural demand of the populace without help from the Merchant Navy and its supply of invaluable resources necessary to keep up this high level of productivity.¹⁸ The *Luftwaffe* sought to stop these merchant seamen and supplemented its attacks on civilian merchant ships with terror bombings of

cities.¹⁹ The closure of the English Channel to shipping gave the Germans fewer areas to attack.²⁰ The civilian merchant ships under fire from the Germans had to perform their duties day after day with utmost fortitude, as their work brought the people of Britain necessary supplies to remain in the fight. These maritime heroes of Britain helped lay the groundwork for the eventual British mindset of doing business as usual in the midst of persistent bombings and deteriorating conditions.

Winston Churchill came into office on May 10, 1940, and set to work inspiring his people and helping them develop and solidify their mental fortitude. His speech to the British House of Commons on June 4, 1940, came at the end of the evacuation of the allied forces at Dunkirk.²¹ This speech was the key moment that told the British people that it was time to stop holding on to their depression and take the reins to fight back against the Germans. Churchill ordered, "We shall go on to the end, we shall fight in France, we shall fight on the seas and oceans, we shall fight with growing confidence and growing strength in the air."²² Churchill's prediction of war on in every theater told people not to be afraid of the German war machine and inspired their resolve against the Nazis. Surrender was not an option under Churchill's jurisdiction, as he continued, "We shall defend our Island, whatever the cost may be, we shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills."²³ He instructed the British to fight to the last person in every area of the British Isles. This speech came before the beginning of the Battle of Britain, as the *Luftwaffe* began its raids a little over a month later. Pride grew from Churchill's words, as the people



MEN WILL STILL SAY, THIS WAS THEIR FINEST HOUR

began to realize that no one would help them through this conflict, and it was up to their own fortitude to survive.

Churchill presaged the imminent Battle of Britain in another speech in the House of Commons on June 18. In it, he said, “the Battle of France is over ... the Battle of Britain is about to begin Upon it depends our own British life, and the long continuity of our institutions and our Empire. The whole fury and might of the enemy must very soon be turned on us.” He finished with, “men will still say, This was their finest hour.” In that, he was correct.

Some historians believe that the Battle of Britain began on July 10, 1940. The British carried on defending their homeland, and on July 14, Churchill gave another speech to rally his people.²⁴ In this speech, Churchill recognized the defeat of France but remained hopeful that the French people would one day regain their statehood and help drive back the German military.²⁵ He continued with unyielding fortitude against the Germans, stating, “we shall seek no terms, we shall tolerate no parley; we may show mercy—we shall ask for none.”²⁶ Churchill takes a more descriptive approach to his inspirational effort, telling his people that he would prefer London razed to the ground than its citizens enslaved by the Nazi regime.²⁷ There would be no “placid lying down of the people in submission” as had happened recently in other countries.²⁸ He concluded the speech by calling on “Unknown Warriors” in Britain and elsewhere to strive to keep the “dark curse of Hitler” from encompassing the earth. The British people took this call-

ing to be Unknown Warriors and join as one against the German war machine.

The raids carried out by the *Luftwaffe* continued into August, and concurrently the British people grew more at ease with their situation. A content outlook toward the bombing raids developed into optimism as the Battle of Britain continued. On August 16, Orwell wrote of “stupendous German losses” that tore the *Luftwaffe* to pieces and of the reports on the days before when British pilots scored heavily.²⁹ The success of the Royal Air Force pilots combined with the relatively low damage to British cities to create an atmosphere and a view that life during the Battle of Britain was not actually as bad as the common people had previously anticipated. This fact emerges in Orwell’s recounting of August 19, when he gained some insight into the effects of bombing on other cities:³⁰

A feature of the air raids is the extreme credulity of almost everyone about damage done to distant places. George M. arrived recently from Newcastle, which is generally believed to here to have been seriously smashed about, and told us that the damage there was nothing to signify. On the other hand he arrived expecting to find London knocked to pieces and his first question on arrival was “whether we had had a very bad time.” It is easy to see how people as far away as America can believe that London is in flames, England starving, etc., etc.

Orwell and his British compatriots saw this occurrence as good for the British Isles.³¹ Orwell’s comments were backed up in an article on damage

BRITISH
NEWSPA-
PERS
PRINTED
DURING THE
BATTLE
HELPED THE
PEOPLE
STAY
POSITIVE



in London, published on October 1 in *The Daily Mail*. The article stated, “In a north-eastern suburban district [of London] a number of houses were destroyed and casualties caused, but reports indicate that damage generally has not been extensive nor the number of casualties large.”³² British defiance grew in the face of these uncertainties and allowed for the slow cohesion to develop amongst the common people, as they knew that the Germans could damage their cities only to an inconsequential degree.

Other British newspapers printed during the battle helped the people stay positive. On August 1, the *Nottingham Evening Post* ran an upbeat headline, “R.A.F. ‘Plaster’ Enemy.”³³ Other articles further described British success under titles like “British Plane Output Now Exceeds German Production and Steadily Increasing,” and, “R.A.F. Get Two More Craft; Attack Successes in the Mediterranean.”³⁴ Each of these titles appeared on the front page of this particular newspaper, showing that its editors wanted to broadcast British successes to the general populace. Newspapers eventually changed their reporting subjects throughout the course of the battle, though they still focused on keeping the people upbeat. The latter weeks of the battle saw many more reports on British bombings of German mainland targets. One such report was published on October 1, titled, “R.A.F. Bombs Berlin, West Germany and the Invasion Ports.” The article went on to brag about how the German people were in bomb shelters for five hours.³⁵ On October 15, another publication wrote of a “Heavy attack on Stettin and other oil plants” in Germany.³⁶ Overall,

British newspapers were dedicated to the prosperity of the people and praised the actions of the Royal Air Force in fighting the *Luftwaffe*.

Winston Churchill’s powerful yet calm demeanor put many Britons at ease throughout the Battle of Britain. On October 17, Nicolson wrote about his experience with the prime minister when taking a break from his governmental duties: “I go to the smoking-room...Winston [Churchill] is at the next table. ‘How are you?’ he calls gaily to the most obscure Member. It is not a pose. His very presence gives us all gaiety and courage.”³⁷ Churchill cooled the nerves of the members of Parliament and the people at large so that these people would see him as a calm and collected leader. During this same break, the members prodded Churchill to bomb German cities in revenge for the months of bombing of Britain.³⁸ Churchill rejected the idea and argued for a focus to destroy German military objectives.³⁹ Churchill closed the argument by stating, “I quite appreciate your point. But my motto is ‘Business before Pleasure.’”⁴⁰ This resolve to deal with the German military before taking revenge on the citizens under the Nazi regime helped keep Churchill’s, and consequently the common people’s, focus on winning the Battle of Britain. This focus allowed the people to hold out even in these closing weeks of the battle and remain strong in the face of a powerful German military.

The Battle of Britain and the unity it inspired in the common people helped British society grow as a whole. The “Social Revolution” during the years 1940-1945 exemplified the period of reform after the Battle of Britain and prepared the British people for

THE BATTLE
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THE BATTLE OF BRITAIN DEFINED WHAT IT MEANT TO BE BRITISH

the changes that occurred in the years following the end of the Second World War.⁴¹ This revolution came as a result of the people's realizing that political bickering, unemployment, and a poor economy were terrible things for a modern society. It grew from the day-to-day living under the showers of bombs that the *Luftwaffe* dropped on Great Britain and the resultant numbness the common people felt as a result of such persistent danger. A summation of correspondence between George Orwell's associates Eileen and Norah Miles shows just how normal the raids became: "Mental condition—temporarily improved by air raids which were a change, degenerating again now that air raids threatened to become monotonous."⁴² She continued with a further description of daily life: "Events since the [Battle of Britain]—daily work of inconceivable dullness; weekly efforts to leave Greenwich always frustrated; monthly visits to the cottage which is still as it was only dirtier."⁴³ The lives of the people living in London and other cities during the Blitz were monotonous, as there was little to do besides sit and wait for the bombs to stop falling. Most importantly of all, the battle gave them time to think. The British people realized that their new unity and the ineffectiveness of the German bombers allowed them the chance to win the battle and eventually the war.

Part of British determination lent itself to the ability of British city-planners, led by the nationally designated Barlow Commission, to get ready for the future. Before the war, suburbs began creeping fur-

ther and further into British farmland, a process that angered British farmers.⁴⁴ The German aerial bombardment of Britain and its concurrent use of terror-bombing to destroy civilian centers wrought periodic damage to these suburbs.⁴⁵ This damage nudged the Barlow Commission's goals into the spotlight as "collectivist sentiments" grew and "widespread interest in reconstruction" spread amongst the British people.⁴⁶ Architects such as Maxwell Fry promoted the creation of new modern areas for civilian settlement where people could live in "cheerful, health conditions, which only proper planning (could) ensure; an attack on the slums to begin immediately after the war."⁴⁷ The early planning for a new, modern Britain gave people something to look forward to during the war and allowed some hope for a future that seemed far away. These reconstruction planners under the Barlow Commission did not sit around, depressed by the destruction of their cities; they simply turned the bombings into an opportunity to change British society for the better.

The Battle of Britain defined what it meant to be British: a unified people that would not fall in the face of evil and certain death. Fortified by the calm and inspiring Winston Churchill, and as recorded by George Orwell and Harold Nicolson, the British people developed from a downtrodden collection of disparate classes during the 1930s to the unified bulwark they became during the rest of the war, though the period after was politically tumultuous. Unemployment, economic depression, and political

disunity contributed to the troubling mentality that plagued the British public before the war. Britons did not have the capacity to defeat the Germans at that time, though the fall of their European mainland neighbors forced them to reevaluate their perspective. Civilians began their role in the war working with the Merchant Navy in an effort to supply the rapidly developing British infrastructure. The resilience of these maritime workers laid the benchmark for British resilience in the coming years, as hundreds of *Luftwaffe* planes made their way to British cities in an effort to destroy the will of the people. Nicolson spoke of an excitement that existed

as a result of the challenge of this new enemy and the potential to actually bring Britain out of its abysmal state. Orwell recounted how the Battle of Britain progressed little as expected due to the inaccuracy of facts spread throughout the country. British newspapers from all over the country supported both men in their claims. Churchill inspired his people to say no to their German opponents and encouraged them to believe that honor resided in fighting together until the last man fell. These circumstances allowed the British people to thrive in the face of aggression, to defy the odds, and to endure the German threat. ■

NOTES

1. Richard North, *The Many Not The Few: The Stolen History of the Battle of Britain* (London: Continuum, 2012), Kindle Location 384. Jodl was an influential proponent for the Battle of Britain and was optimistic about the potential success in bombing Britain.
2. *Ibid.* The Germans began bombing airfields and switched to industrial centers soon after. Both of these efforts were unsuccessful so they switched to bombing civilian centers; an attempt that carried on until the end of the battle.
3. Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (Washington D.C.: Air Force History and Museums Program, 1998), p. 10. In the context of Douhet's work, this quote implies that the *Luftwaffe* would be able to destroy all of Great Britain. This did not occur as Scotland, Ireland, and Northern England remained relatively immune to German bombing capabilities.
4. *Ibid.*, p. 293.
5. John Stevenson, *British Society, 1914-45* (London: Pelican Books, 1984), p. 294.
6. *Ibid.*, p. 294. This information comes from Stevenson's direct quotation of the Pilgrim Trust's findings. This trust collected copious information on the status of unemployed workers across Britain and directly involved itself in working toward fixing the popular outlook toward the unemployed.
7. *Ibid.*, p. 295.
8. Peter Davison, ed., *George Orwell: Diaries* (London: Harvill Secker, 2009), p. 267. This collection of diaries from throughout Orwell's life documents his efforts surviving in London during the Battle of Britain.
9. *Ibid.*, p. 267.
10. *Ibid.*, p. 269.
11. Harold Nicolson, *The War Years: Diaries & Letters, 1939-1945*, ed. Nigel Nicolson, First (Kingsport, Tennessee: Kingsport Press, Inc., 1967), p. 101. Nicolson's unadulterated thoughts come from this primary source as he describes what happens to London and the concurrent effects of the Battle of Britain on the people around him.
12. *Ibid.*
13. *Ibid.*
14. *Ibid.*, p. 103.
15. *Ibid.*
16. North, *The Many Not The Few: The Stolen History of the Battle of Britain*, Kindle Location 359.
17. *Ibid.*
18. *Ibid.*
19. *Ibid.*
20. G. H. Bennett and R. Bennett, *Survivors: British Merchant Seamen in the Second World War* (London: Hambledon Press, 1999), p. 32.
21. "We Shall Fight on the Beaches" (The House of Commons: BBC, June 4, 1940). Source is from the iTunes Album *Sir Winston Churchill Speeches*. This album holds all of Churchill's speeches originally broadcast over the BBC during his term in office.
22. *Ibid.*
23. *Ibid.*
24. "War of the Unknown Warriors" (London: BBC, July 14, 1940). This radio broadcast also comes from the aforementioned album of collected Churchill Speeches.
25. *Ibid.*
26. *Ibid.*
27. *Ibid.*
28. *Ibid.*
29. Davison, *George Orwell: Diaries*, p. 272.
30. *Ibid.*, 273.
31. *Ibid.*, 273.
32. "Damage Not So Extensive," *The Daily Mail*, October 1, 1940, sec. 1.
33. "R.A.F. Plaster Enemy," *Nottingham Evening Post*, August 1, 1940, sec. 1.
34. *Ibid.*, 1.
35. "R.A.F. Bombs Berlin, West Germany and the Invasion Ports," *The Daily Mail*, October 1, 1940, sec. 1.
36. "R.A.F. Over Berlin; Heavy Attack on Stettin and Other Oil Plants," *Evening Telegraph and Post*, October 15, 1940, sec. 1.
37. Nicolson, *The War Years: Diaries & Letters, 1939-1945*, p. 121.
38. *Ibid.*, 121.
39. *Ibid.*, 121.
40. *Ibid.*, 122.
41. Francois Bedarida, *A Social History of England, 1851-1975*, trans. A. S. Forster (New York, New York: Methuen & Co. Ltd., 1979), p. 190.
42. George Orwell, *A Life in Letters*, ed. Peter Davison (London: Harvill Secker, 2010), p. 188.
43. *Ibid.*
44. Stevenson, *British Society, 1914-45*.
45. *Ibid.*, p. 237.
46. *Ibid.*, p. 238.
47. *Ibid.* This information comes from a block quote in *British Society, 1914-1945*. Stevenson utilizes Maxwell Fry as the resident authority on reconstructing Britain after the devastation that occurred during the *Luftwaffe* raids. This quote originally came from the image-based magazine *Picture Post* in January, 1941.

The Bell P-39 Airacobra



: The British Perspective



A. D. Harvey

PERHAPS
THE MOST
INNOVATIVE
DESIGN OF
ITS TIME...
A SINGLE-
ENGINED
WARPLANE
WITH ITS
ENGINE
BEHIND THE
PILOT

The Bell P-39 Airacobra presents one of the most striking paradoxes of air combat in World War II: a disappointment in the hands of American pilots, it was the favourite aircraft of several Soviet air aces, including two of the three highest scorers, Aleksandr Ivanovich Pokryshkin and Grigori Andreevich Rechkalov.¹ The brief career of the Airacobra in Britain's Royal Air Force (RAF), with which the type first saw action months before its combat debut with the USAAF and Soviet VVS, may not explain the difference in U.S. and Soviet estimates of the aircraft's capabilities but provides a sidelight into how it came about.

Perhaps the most innovative design of its time for a single-engined warplane with its engine behind the pilot and nose-wheel undercarriage, the Airacobra first flew in April 1939, and was ordered for the U.S. Army Air Corps later in the same year.² On April 10, 1940 the Anglo-French purchasing board ordered 165 Airacobras for the French *Armée de l'Air*; this being only one item in a stack of contracts, for a total of 4,600 aircraft of different types, that was signed in Washington that day.³ After the fall of France, the British took over the contract for the Airacobra, which was initially amended to 170 machines and subsequently supplemented by orders for 505 more.⁴ It was at first intended to commence deliveries on the original order in November 1940, and to complete the handover in April 1941, but by December 1940, it was evident that deliveries were going to be a couple of months behind schedule, mainly owing to shortfalls in the delivery of engines and propellers to the Bell Aircraft Corporation.⁵ Nevertheless the Royal Air Force was pleased with its acquisition: Air Commodore J.C. Slessor, formerly the RAF's Director of Plans but currently in Washington for staff talks, reported on December 14, 1940: 'as far as I know – there is no other U.S. fighter which could be in quantity production by 1942 likely to exceed the Airacobra in performance and fire power.'⁶

Trials carried out by the RAF with the Airacobra flying against the Spitfire VB and a captured German Messerschmitt Bf 109E in September 1941 found that the Airacobra was faster than the Spitfire VB up to 15,000 feet but 'was out-climbed and just out-turned' by the Spitfire. As for the German aircraft:

The Me. 109 cannot compete with the Airacobra in a turn and even if the Me.109 is behind the Airacobra at the start, the latter should be able to shake him off and get in a burst before two complete turns have been carried out.

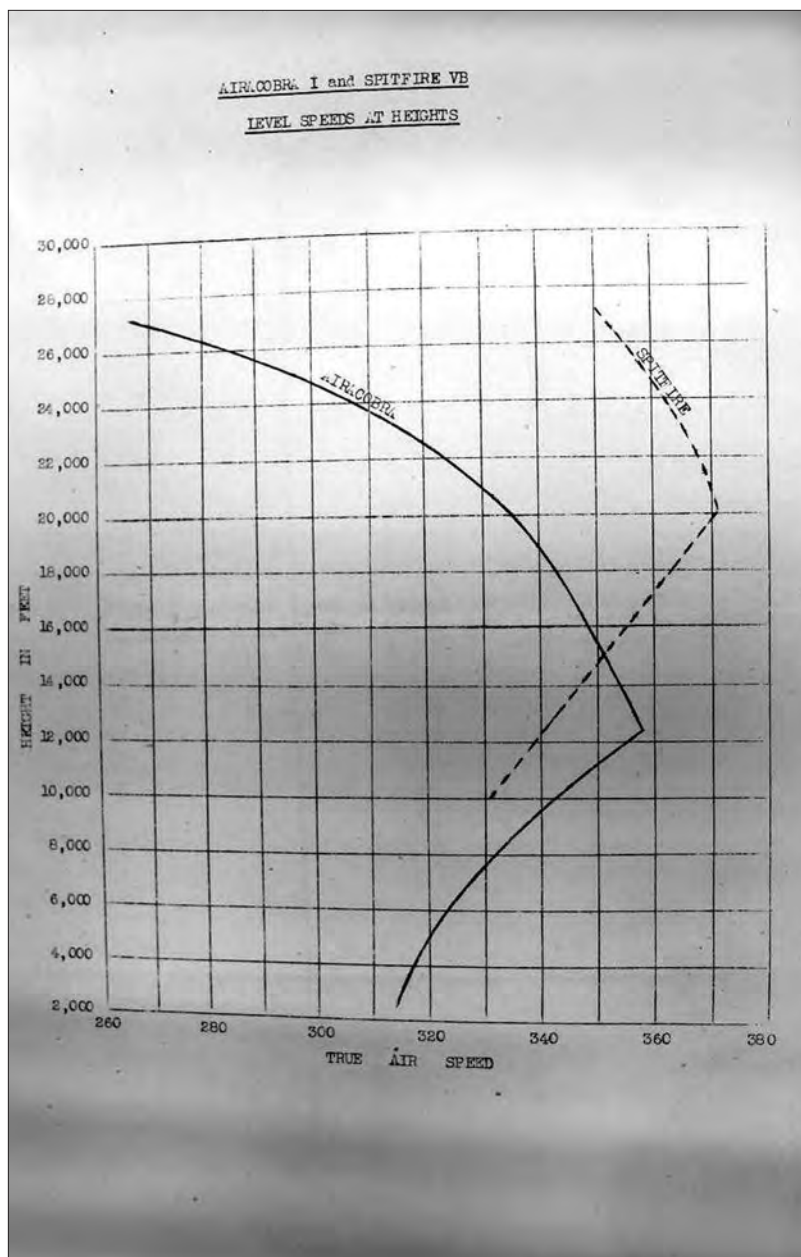
The Me. 109 then tried diving on the Airacobra from above and continuing the dive down to ground

level after a very short burst of fire. It was found, however, that the Airacobra could catch up on the Me. 109 in dive of over 4, 000 feet.⁷

By this stage of course the Bf 109E had been superseded by the more aerodynamic Bf 109F, which in turn would be in the process of being superseded by the more powerful Bf 109G by the time American P-39 Airacobras went into action against the *Luftwaffe* in North Africa; but as it happened the Airacobra remained faster than these later marks of Bf 109 below 10,000 feet, and its superiority in turning became even more noticeable. Initially the RAF's main problem with the Airacobra was what to do with it. There was no question of using it to re-equip squadrons already flying the Spitfire, which was on balance as good below 15,000 feet and markedly superior at altitudes above that, and an even faster and more heavily armed type, the Hawker Typhoon, was beginning to come off the assembly lines in greater numbers. The main use for the Airacobra was envisaged as the 'the possible equipment of the Army Co-operation Squadrons', i.e. as a ground-attack aircraft; but even in this role the Airacobra had a competitor in the North American Mustang – A-36 in U.S. service – which was also being manufactured in the United States for a British contract.⁸

No. 601 Squadron RAF, previously flying Hawker Hurricanes, had begun re-equipping with Airacobras during the second half of August 1941. On October 9, 1941, two of 601 Squadron's Airacobras flew to Dunkirk 'where they shot up a number of bodies on the pier, and severely hurt the feelings of a trawler.' Next day a single Airacobra flew to France and shot up several barges behind Dunkirk. On November 11, 1941, three Airacobras set out on a shipping strike but found no targets.⁹ That was the last combat mission flown by British Airacobras. It had been found that firing the guns mounted in the Airacobra's nose affected the compass, causing deviations from seven degrees to 150 degrees on various headings.¹⁰ Inquiries in the U.S. elicited the response that the problem was due to British technicians' failure to demagnetize the guns, but the Ministry of Aircraft Production in London pointed out that the problem arose from the magnetic field of the guns changing in the process of firing.¹¹ Staff at RAF Fighter Command and the Admiralty Compass Observatory tried to find a solution and suggested that the distant-reading Pioneer compass should be installed in the Airacobra's wing, but these needed to be sent from the U.S., and Air Chief Marshal Sir William Sholto Douglas, Air Officer Commanding-in-Chief RAF Fighter Command, informed the Air Ministry on November 7, 1941, that till this "depressing situation" was

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This illustration is part of the RAF's Air Fighting Development Unit report on the Airacobra. (Illustration from The National Archives, Kew, AIR 20/12769.)

remedied, "I can foresee no prospect of using the Airacobra aircraft of No. 601 Squadron in operations."¹² As it turned out, the problem was still unsolved when Britain's Airacobras were overtaken by the fall-out from events overseas, and No. 601 Squadron was withdrawn to Yorkshire to re-equip with Supermarine Spitfires early in January 1942.¹³

The first development abroad that impacted on the Airacobra's career with the Royal Air Force was Nazi Germany's invasion of the Soviet Union in June 1941. The British quickly decided to provide material assistance to the Soviet armed forces. In a meeting at the Air Ministry in London on July 24, 1941 a Soviet delegation requested a variety of items, including blue-prints for the construction of large bombs, 200 tons of tetra-ethyl lead for the manufacture of aviation fuel, and 200 Curtiss Tomahawks, the RAF version for the P-40C.¹⁴ The Moscow Conference in September 1941, committed the British to supply the Soviets

with 200 fighter aircraft per month. This confronted the Air Ministry with the problem of where to find spare fighters. Even before the Moscow Conference finalized Britain's commitment it had been pointed out that there were simply not enough Hawker Hurricanes and Kittyhawks (Curtiss P-40Ds) to keep up numbers in the Middle East and supply the Soviet Union.¹⁵ When it was proposed that the Airacobra could be used to make up the numbers Sholto Douglas told the Air Ministry:

I would like to have further experience of the Airacobra before saying that I would agree to the Americans sending it to Russia. Up to a point it is a promising and attractive job, and if only the high altitude performance could be improved, I think that we should find them very useful.

*In any case they be a useful type for convoy protection work – which, after all, is the work on which most of our operational flying hours are spent – or as a night fighter.*¹⁶

This of course was before the problem with the compass emerged. Within less than two weeks – actually two days before the Airacobra's combat debut – Sholto Douglas had decided that the Airacobra was the aircraft he could most easily spare, and on October 14, 1941, it was decided to send a hundred Airacobras a month to Russia from December 1941 onward: in fact the first thirty-four were dispatched in November.¹⁷ Eventually the British attempted to corner sufficient of the factory output of P-39s in the U.S. to cover their entire commitment of 200 fighter aircraft a month for Russia.¹⁸ They thought it was a nice aircraft but it wasn't one they actually needed.

By December 1941, over four hundred of the P-39s on order for the Royal Air Force had arrived in Britain. Of these 212 were shipped from Britain to Murmansk in the USSR (fifty-four being lost in transit). A further 179 were eventually provided for use by the USAAF in North Africa later in 1942. Another two hundred or so that were still in the U.S. were requisitioned, and for the most part sent to the Pacific Theatre, because of course the Japanese attacked Pearl Harbor and brought the U.S. into the war on December 7, 1941. The Japanese attack found the U.S. at a relatively early stage of expanding and re-equipping their armed forces. On March 31, 1941, the U.S. Army Air Corps had on hand 324 P-40s (with a further twenty-seven due for delivery by the end of June), thirty-one P-39s (with forty-six due by June 30), four P-38s (with fifteen due by June 30), 179 obsolescent Curtiss P-36s and 116 completely out of date Seversky P-35s: so short was the USAAC of equipment that approximately half of the P-35s came from requisitioning machines produced for a Swedish order.¹⁹ Having themselves undertaken to supply a hundred fighters a month to the Soviet Union (and a hundred bombers), the U.S. had immediate need of the requisitioned British Airacobras.

8. Under most economical conditions the endurance is increased to about 3 hours 30 minutes at an approximately true airspeed of 183 m.p.h. at 8,000 feet, 217 m.p.h. at 12,000 feet and 215 m.p.h. at 20,000 feet.

FLYING CHARACTERISTICS

9. The aircraft is pleasant to fly and very easy to take-off and land. The controls are well balanced and although heavier than those of the Spitfire at normal speeds, do not increase appreciably in weight at high speed as in the Spitfire. It is difficult to hold the aircraft in a dive at high speed unless it is trimmed nose-heavy.

10. The upward recognition light on the first 40 aircraft is installed on the starboard mainplane about 5 feet inboard of the wing tip and about 2 feet forward of the leading edge of the aileron. The light is approximately 3 inches high and it was necessary to trim the port wing 3 degrees down on the aircraft under trial to counteract the drag caused by the light. It is understood that a modification altering the position of this light is to be incorporated.

11. During a turn the Airacobra gives ample warning of a high speed stall by severe vibration of the whole airframe.

12. Due to the fact that the Allison engine has a Stromberg pressure carburettor, it is possible to apply negative 'G' without the engine cutting, although there is a slight loss of power for a short period.

Climb and Ceiling

13. The time taken to climb from take-off to 20,000 feet is about 15 minutes under maximum continuous climbing conditions. The operational ceiling is considered to be about 24,000 feet, but there is a marked decrease in performance above 20,000 feet.

14. At the Airacobra's rated altitude of about 13,000 feet, it is approximately 18 m.p.h. faster than the Spitfire VB. However, the speed of the Airacobra falls off rapidly above this height, and the speeds of the two aircraft are about the same at 15,000 feet. At 20,000 and 24,000 feet, the Spitfire VB is faster by about 35 m.p.h. and 55 m.p.h., respectively. A graph showing the comparative speeds of the two aircraft is attached as Appendix 'B'.

15. The aircraft behaves normally in aerobatics.

TACTICAL TRIALS

Search

16. The all-round field of view of the aircraft is good, being much better than that in the Spitfire, although the I.F.F. installation interferes slightly with the view to the rear.

Formation Flying

17. The Airacobra is simple to handle in formations and formation attacks, although its deceleration is poor due to its clean design. Take-offs and landings in close formation are not considered practicable, as although it is possible to check a swing, it is difficult to bring the aircraft back to its original path.

Manoeuvrability - Dog-Fighting

18. The aircraft has been compared with a Spitfire VB and a Mo.109B for manoeuvrability in dog-fighting.

/19.

This illustration is part of the RAF's Air Fighting Development Unit report on the Airacobra. (Illustration from *The National Archives*, Kew, AIR 20/12769.)

The French in 1940, had decided against using the 37mm Colt-Browning cannon fitted to USAAC-specification Airacobras, preferring instead the 20mm Hispano cannon. The British had adopted this alteration. The USAAF used the Bell Aircraft Corporation's in-house designation for Airacobras with the 20mm cannon, which was P-400. Many U.S. and Soviet pilots preferred the P-400: in the Pacific the 37mm cannon on the P-39 often jammed after a couple of shots, whereas the Soviet verdict was that the 37mm cannon was perfectly reliable if properly maintained by qualified ground-crew, but that it was difficult to aim, the first round tending to fly over and the next under.²⁰ The solution of course was to get very close: and Soviet pilots evidently enjoyed the often spectacular effect of a direct hit with a 37mm round on an enemy aircraft.²¹

The first combat mission by a Soviet Airacobra took place on May 5, 1942 but it only began to be employed in large numbers on the Eastern Front after Stalingrad, by which time it had done its most important work in U.S. service. It had been the Curtiss P-40 – notionally a newer design but in reality a re-engining of the Hawk 75 (P-36) of 1935 – which had borne the brunt of combat with Japanese units in the Philippines, Java and northern Australia, but as early as mid-March 1942 there were almost as many P-39s and P-400s available in the Far East as P-40s. Airacobras of the 8th Fighter Group were sent to Port Moresby in New Guinea at the end of April 1942, joining P-40s operated by No. 75 Squadron Royal Australian Air Force: there were no American-flown P-40s in New Guinea till mid-September, and Lockheed P-38s did not arrive till December. The Airacobra – initially P-400s, later also P-39s – was also the only USAAF fighter in Guadalcanal from August 1942 till the arrival of P-38s in November. Though it was in Guadalcanal that the one and only USAAF Airacobra ace, Lieutenant William Fiedler, achieved his five victories it was U.S. Marine F4F Wildcats which were chiefly responsible for the air defence of U.S. positions: Guadalcanal was essentially a Marine operation, and the Wildcat was usually available in greater numbers. The Airacobra was largely confined to ground attack missions, Guadalcanal being the only campaign in the entire war where this was the case.²² In New Guinea, ground attack missions by Airacobras took second place to air-to-air combat. Neither in New Guinea nor on Guadalcanal did the Airacobra seem to distinguish itself. The P-40 had made a reputation for itself with the American Volunteer Group ('Flying Tigers') in Burma, but the Airacobra was generally seen as a stop-gap: the confusing P-400 designation of the 20mm-armed models in itself suggested some sort of muddle. Almost all the Airacobra pilots were without combat experience before going into action, many had very few flying hours, and they had been thinking in terms of air-to-air combat and obtained little satisfaction from shooting up assumed Japanese positions concealed by dense tree cover, and came away with the impression that Japanese pilots were running rings around them. They attributed this to the inferiority of their aircraft rather than to the real cause, the superiority of Japanese pilots (or at least their training). They were aware that because the Airacobra's Allison engine lacked a turbo-supercharger speed fell off above 12,000 feet: they simply failed to notice that their aircraft were nevertheless faster than Japanese fighters at *all* altitudes and that moreover Japanese pilots were obliged to throttle back considerably in order to make the violent manoeuvres with which they repeatedly dodged and countered American interception.²³ (The unusually large ailerons in both the Mitsubishi A6M2 Zero and the Nakajima Ki-43 were difficult to move at maximum speed, and

19. The Airacobra and the Me.109 carried out dog-fighting at 6,000 feet and 15,000 feet, the latter aircraft having a height advantage of 1,000 feet in each case. The Me.109, using the normal German fighter tactics of diving and zooming, could only get in a fleeting shot.

20. The Me.109 cannot compete with the Airacobra in a turn and even if the Me.109 is behind the Airacobra at the start, the latter should be able to shake him off and get in a burst before two complete turns have been carried out.

21. The Me.109 then tried diving on the Airacobra from above and continuing the dive down to ground level after a very short burst of fire. It was found, however, that the Airacobra could catch up on the Me.109 in a dive of over 4,000 feet.

22. The Airacobra then carried out a similar trial with the Spitfire V and it was found that although the Airacobra has a superiority of speed up to 15,000 ft., it was out-climbed and just out-turned by the Spitfire.

23. These combats show that when fighting the Me.109E below 20,000 feet, the Airacobra is superior on the same level and in a dive. Unless it had a height advantage the Airacobra could not normally compete with an aircraft similar to the Spitfire V. If on the same level or below, at heights up to about 15,000 feet, the Airacobra would have to rely on its superior level and diving speeds and its ability to take negative 'G' without the engine cutting. Above this height, the Airacobra loses its advantage in level speed. Both the Spitfire VB and the Me.109E have a superior climb to that of the Airacobra.

Low Flying

24. Due to the excellent view and the controllability of the aircraft, it is very suitable for low flying, and is fully manoeuvrable at speeds above 160 m.p.h.

Night Flying

25. The aircraft was flown on a dark night with 10/10ths cloud at 5,000 feet and visibility 4 miles. Take-off and landing at night is not difficult and the retractable landing lamp, which is similar to that installed in the Spitfire, is satisfactory. The movable fluorescent light which energises the luminous instruments is very good and does not appear to affect the pilot's night vision.

26. Due to the position of the engine, the exhaust flames cannot be seen from the pilot's cockpit. However, the exhausts are visible to another aircraft flying up to 3 miles astern.

27. All guns were fired at night on the stop butts. It was found that the flash from the .50 guns was blinding, and it is thought that after firing one burst a pilot would lose his night vision for some time, and would certainly lose the target.

Instrument Flying

28. The aircraft can be trimmed to fly 'hands and feet off', which makes it comparatively easy for instrument flying.

Sights

29. The American S.T.I.A. sight which is installed in the Airacobra aircraft was tried in a series of astern, quarter and beam attacks, and is not considered as satisfactory as the G.M.S. sight. The 60 m.p.h. ring is reflected on a glass screen and although it has no adjustable range bars, it is thought that pilots using the sight should obtain reasonable results after practice. The rheostat which controls the dimming of the sight is more efficient than that of the G.M.S. It was also found that the yellow light is more satisfactory than the orange light used in British reflector sights. During night trials the sight proved to be excellent in all respects. The bulb illuminating the sight is not interchangeable in flight, but a ring and bead sight is fitted in case of failure.

/Amour.

This illustration is part of the RAF's Air Fighting Development Unit report on the Airacobra.

(Illustration from The National Archives, Kew, AIR 20/12769.)

the combat flaps on the Ki-43 needed to be used with caution to avoid over-straining the relatively lightweight structure of this type.) The most substantial defect of the Airacobra in the Pacific Theatre was that the oxygen system in British-specification P-40s needed higher-pressure oxygen bottles which were not available.²⁴ It was only slowly learnt that the answer to Japanese superiority in combat was not a better plane but better tactics, primarily not playing to their game, avoiding dog-fighting, and relying on high-speed attack and a quick escape.

In the Mediterranean the Airacobra also gained little credit. There the *Luftwaffe* was outnumbered even before the arrival of the Americans. During most of 1943 there were four

USAAF fighter groups of P-40s to two of P-39s. It seems to have been realized from the outset that the P-39's 37mm Colt-Browning, however effective against Japanese infantry hiding amongst trees, was not powerful enough to disable German tanks, was of little use against European troops properly dug-in in slit trenches, was not more effective than multiple 0.50 mm machine guns in smashing up wheeled vehicles, and with a magazine of only 30 rounds was at a disadvantage as a ground-attack weapon. Consequently it was the P-40 which was assigned to the ground-attack role while the faster P-39 carried out air defence and convoy escort duties. And since the *Luftwaffe* was obliged by its over-stretched numbers to confine itself to operations over the battlefield in support of Axis ground troops, it was the P-40 which most frequently encountered enemy aircraft. In all, 107 P-39s were lost to all causes in the Mediterranean Theatre, as compared to 553 P-40s. P-39 pilots were credited with a total of twenty enemy aircraft destroyed; P-40 pilots, twice as numerous and therefore flying approximately twice as many missions, were credited with 480 enemy aircraft destroyed.²⁵ Basically the Airacobra was unable to show its true quality in the Mediterranean because it mainly operated where there were no enemy aircraft.

It was quite otherwise with the Airacobra in Russian service. Altogether 4,764 P-39s were supplied to the Soviet Union, together with 2,952 Hawker Hurricanes, 2,097 P-40s and 1,331 Supermarine Spitfires. These figures look insignificant beside the 37,000 Yak-1s, Yak-3s, Yak-7s and Yak-9s and the over 20,000 Lavochkin La-5 and La-7 fighters built during the war, but at least as far as the Airacobra was concerned it was not simply a matter of numbers. The Russians had a low opinion of the P-40 and an even lower opinion of the Hawker Hurricane - 'awful planes - very nasty' - and found that 'The though the RAF were well aware that 'The Russians have always objected strongly to receiving used aircraft', most of the Spitfires supplied were half worn-out, one of them having served with four different RAF squadrons and been rebuilt after a bad crash.²⁶ But they had the highest opinion possible of the Airacobra and issued it to elite units. They praised the cockpit heating, the cockpit lay out, the transparency of the canopy, the excellent all-round visibility, the relative ease of taxiing on snowy airfields afforded by the nose-wheel undercarriage, and the two-way radio, which led to a kind of revolution in Soviet fighter tactics as previously only formation leaders had transmitters, the other pilots having only receivers and no way of calling in if they spotted a German aircraft first.²⁷ As air fighting on the Eastern Front was generally at lower altitudes Russian pilots had no problem with the falling off of the Airacobra's speed above 12,000 feet. At a dinner in honour of Wendell Wilkie in September 1942, Stalin complained, 'The American

A group of Bell Airacobra Mk. Is from the No. 601 Squadron, Royal Air Force. Their service was short-lived with the RAF.



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Government has furnished the Soviets P-40 fighters not Airacobras [sic]; the British have supplied Hurricanes, not Spitfires.²⁸ Shortly afterwards he wrote to Churchill saying, 'What we particularly need is Spitfires and Airacobras,' and four days later, to Roosevelt saying, 'We are badly in need of increased deliveries of modern fighter aircraft – such as Airacobras.'²⁹ The importance he attached to the Spitfire was undoubtedly due in part to the sedulous mythologizing of that aeroplane in the media ever since the Battle of Britain: the importance he attached to the much less celebrated Airacobra must have been mainly due to the merits of the first machines sent to Murmansk by the British.

The story of the Airacobra suggests that with aircraft types as with human individuals, reputation and success depend to a great extent on the luck of timing, the luck of decisions made elsewhere, the luck of what is encountered when, the luck of having or not having contemporaries who look better. RAF Fighter Command's problems

with the Airacobra's compass might have been a mere hic-cup if it had not been for the fact that the Soviet Union's need for aircraft came to the top of the agenda at much the same time. And even with Soviet insistence on their promised 200 fighters a month, the RAF might have reconsidered use of the Airacobra if the North American Mustang (A-36) with greater development potential had not become available in 1942. Again, if the *Luftwaffe* had chosen to employ different tactics in the Mediterranean the Airacobra might have given a much better account of itself. One has a sense of the Airacobra, both in British and American service, as experiencing a succession of variations on the theme of falling between two stools. Still, the Airacobra cannot be said to have been under-rated: the British never denied its merits and the Russians, who were distinctly snooty about so much Lend-Lease material, thought it was wonderful – and the production run of 9,508 must have pleased the Bell Aircraft Corporation. ■

The P-39 was used with great success by the Soviet Air Force, who scored the highest number of individual kills attributed to any U.S. fighter type.



1. More than thirty Soviet pilots were credited with shooting down twenty or more German aircraft while flying the P-39: George Mellinger and John Stanaway, *P-39 Airacobra Aces of World War II* (Oxford, 2001), p. 7.
2. The Bell P-39 and the Bell P-63, which was derived from it, were the *only* aircraft to be put into mass-production that had the engine behind the pilot and the propeller in front of him. The twin-boom arrangement of the contemporary Lockheed P-38 Lightning had been more or less anticipated by the Caproni trimotors of World War I, and the lay-out of the P-38 was exactly the same, except with respect to the size of the crew nacelle, as in the Fokker G I, which first flew ready two years earlier than the P-38, and in the Focke-Wulf Fw 189, which first flew six months earlier than the P-38.
3. Birch Matthews, *Cobra! Bell Aircraft Corporation 1934-1946* (Atglen PA, 1996), p. 116.
4. *Ibid.* pp. 117, 149.
5. The National Archives, Kew, London, AVIA 38/793, F. W. White to L. C. Ord, Nov. 9, 1940; M. Stupar to F. W. White, Dec. 4, 1940.
6. *Ibid.*, note by Air Commodore J.C. Slessor, Dec. 14, 1940.
7. The National Archives, Kew, AIR 20/12769, Air Fighting Development Unit, Duxford, Report No. 34, Sep. 22, 1941. British reports on the Bf 109F and Bf 109G may be found in AIR 16/350, duplicated in AVIA 6/8978, and AIR 40/191.
8. The National Archives, Kew, AIR 8/930, 'Types of Aircraft for Supply to Russia', memo by Air Commodore R. P. M. Whitham, Director of War Organisation, Dec. 10, 1941.
9. The National Archives, Kew, AIR 27/2069/19, No. 601 Squadron: Operations Record Book. Matthews, *Cobra!* p. 265 gives a slightly different account.
10. The National Archives, Kew, AIR 20/2999, Air Chief Marshal Sir William Sholto Douglas to Air Chief Marshal Sir Wilfred Freeman, Nov. 7, 1941.
11. The National Archives, Kew, AVIA 6/8978, British Air Commission, Washington to Ministry of Aircraft Production, London Oct. 16, 1941 and reply Oct. 21, 1941. According to an email to this author from Professor Nicholas Collings, Department of Engineering, Cambridge University, Oct. 1, 2015, the movement of gun parts while firing could generate an electric current, and in addition the combustion gases from the ammunition when fired would be slightly ionized, i.e. electrically conductive: presumably in more conventional designs such as the Bf 109F or Yak-1 the location next to the guns of the motor with its own moving parts and combustions swamped the effect of firing the guns.
12. The National Archives, Kew, AIR 20/2999, Sholto Douglas to Wilfred Freeman, Nov. 7, 1941.
13. The National Archives, Kew, AIR 27/2070/1-2, No. 601 Squadron: Operations Record Book.
14. The National Archives, Kew, AIR 20/2958, note at beginning of file by Air Vice-Marshal C. Medhurst, Vice-Chief of Air Staff, Jul. 27, 1941.
15. *Ibid.*, item 72A, Air Commodore R.P.M. Whitham to Medhurst Sep. 18, 1941.
16. The National Archives, Kew, AIR 20/2999, Sholto Douglas to Freeman, Sep. 29, 1941.
17. The National Archives, Kew, AIR 8/930, note by Air Commodore R. P. M. Whitham, Dec. 10, 1941, cf. AIR 20/2958, item 79A, Air Vice-Marshal L. N. Hollinghurst, Director General of Organisation, to Whitham, Oct. 8, 1941, and item 83B, Meeting of Air Council, minutes, Oct. 14, 1941.
18. The National Archives, Kew, AIR 20/3906, note by Air Chief Marshal Sir Christopher Courtney, Air Member for Supply and Organisation (i.e. the RAF's Chief Quartermaster), Jan. 27, 1943.
19. Matthews, *Cobra!* p. 163, table 7.7.
20. Eric M. Bergerud, *Fire in the Sky: the Air War in the South Pacific* (Boulder, 2001), p. 248 (interview with C. L. Jones) cf. Artem Drabkin ed., *Barbarossa and the Retreat to Moscow: Recollection of Fighter Pilots on the Eastern Front* (Barnsley, 2007), p. 113 (interview with Ivan D. Gaidenko) and p. 136 (interview with Nikolai G. Goludnikov – full interview on <http://lend-lease.airforce.ru/english/articles/goludnikov>)
21. Van Hardesty and Ilya Grinberg, *Red Phoenix Rising: the Soviet Air Force in World War II*, (Lawrence, Kansas, 2012), p. 200.
22. Bergerud, *Fire in the Sky*, p. 434, cf. Dmitriy Loza, *Attack of the Airacobras: Soviet Aces, American P-39s, and the War against Germany* (Lawrence, Kansas, 2002), p. 15–16, comment by translator, James F. Gebhart, with regard to the Airacobra NOT being used as a ground-attack weapon or tank-buster. The same is also true for the Yak-9T which also carried a 37mm cannon: ground attack was the mission of the much more heavily armoured Ilyushin Il-2.
23. For the P-39 and P-400 in New Guinea and Guadalcanal see Wesley Frank Craven and James Lea Cate eds., *The Army Air Forces in World War II* (7 vols. Chicago, 1948-58), vol. 1 pp. 403-26, Richard L. Watson, 'The Defense of Australia' and vol. 4, pp. 3-200, Richard L. Watson and Kramer J. Rohlfleisch, 'The Crisis in the South and Southwest Pacific'. Japanese fighter ace Saburo Sakai, who fought in the skies over New Guinea from April to August 1942, mentions the P-39 on 25 pages of the relevant section of his memoirs and the P-40 only nine times: Saburo Sakai with Martin Caidin and Fred Saito, *Samurai!* (Annapolis, 1991 edit), p. 356, index.
24. Watson and Rohlfleisch, 'Crisis in the South and Southwestern Pacific', in Craven and Cate, *Army Air Forces*, vol. 4, p. 41.
25. Mellinger and Stanaway, *P-39 Aces*, p. 46.
26. Drabkin, *Barbarossa and the Retreat to Moscow* p. 121 (interview with Ivan D. Gaidenko), and see also, re Hurricanes, The National Archives, Kew AIR 46/26, item 34A para. 53 ('altogether too slow', 27-9 May 1942) and item 71A para. 46 ('low esteem,' Jun. 3, 1943); AIR 19/375, 'Air Chief Marshal Sir Christopher Courtney to Secretary of State, Apr. 18, 1943, and Alfred Price, *The Spitfire Story* (London, 1982), p. 139-40 and especially p. 139, caption to illustration no. 153.
27. Mellinger and Stanaway, *P-39 Aces*, p. 52, Drabkin, *Barbarossa and the Retreat to Moscow*, p. 112 (interview with Ivan Gaidenko) and p. 133 (interview with Nikolai G. Golodnikov) and, for the impact of the P-39's two-way radio, Hardesty and Grinberg, *Red Phoenix Rising*, p. 201.
28. Richard C. Lukas, *Eagles East: the Army Air Forces and the Soviet Union, 1941-1945* (Tallahassee, 1970), p. 147.
29. *Correspondence between the Chairman of the Council of Ministers of the USSR and the Presidents of the USA and the Prime Ministers of Great Britain during the Great Patriotic War 1941-1945* (Moscow, 1957), part 1, p. 70, part 2, p. 35, Oct. 3 & 7, 1942.

Training Afghan Air Force Pilots, 2006-2011





Forrest L. Marion

(Overleaf) The Kabul International Airport (Air Base) flightline, 2008-2009, with Afghan Mi-17 and An-32 aircraft. (Except where otherwise credited, all photos courtesy, Maj. Gen. Walter D. Givhan, USAF Ret.)

WHEN THE U.S. MILITARY BEGAN TO ASSESS... REBUILDING AN AFGHAN AIR FORCE, IT FOUND THAT NEARLY ALL THE ELIGIBLE FORMER PILOTS WERE SOVIET-TRAINED AFGHAN AVIATORS

Since 1947, the U.S. Air Force has trained pilot-candidates and pilots from nations around the world. Beginning in 2005-2006, the Air Force – under combined U.S./coalition initiatives – began attempting to rebuild the air forces of its erstwhile adversaries, the Iraqis and the Afghans. Although the Iraq war did not begin until 2003, a year after the U.S.-led military operation in Afghanistan had apparently stabilized the security situation there, the approval of a development program of U.S./allies former enemies' air forces began, first with Iraq in 2005, and a year later with Afghanistan.

Afghanistan's rulers had experienced air power and its effects in 1919 when the Royal Air Force employed a lone Handley Page V/1500 to bomb the royal palace in Kabul – and which apparently frightened and scattered the king's harem into the city's streets. From the 1920s, the Afghan king wanted an air service and he made arrangements with the Soviets, Italians, and British to obtain assistance in building one. A few Afghan pilot-candidates went to the Soviet Union and Italy for training. For most of the 1930s the Afghans managed to maintain a few aircraft in flying condition while functioning largely on their own – a situation not unlike the 1990s. During World War Two, the combination of Afghan neutrality, preoccupation of its aviation-partners with their own survival, and the logistical obstacles of Afghanistan's landlocked location ensured that its air capabilities remained minimal.¹

After the war, the small Afghan air force employed largely obsolete aircraft mainly for internal policing (i.e., counterinsurgency) purposes. In 1955 a renewed relationship with the Soviet Union brought with it newer aircraft as well as a sovietized Afghan air force to include the training of Afghan pilots. Although the Soviets held sway with the Afghan government, the United States provided assistance as well, as the Afghans deftly played the two Cold War superpowers off of one another. In the early 1960s the U.S. government built Kandahar Airport in the southeastern part of the country while the Soviets constructed Shindand Air Base in the southwest. And during that decade, a small number of Afghan pilot-candidates came to the United States for training. In a poignant moment in the spring of 2009, retired Afghan Air Force Col. Ghulam Mustafa Tayer – who fifty years earlier had become the first of his countrymen to earn pilot wings in the United States – addressed the pilots and pilot-candidates of the Afghan National Army Air Corps shortly before the first group traveled to America to begin training.²

By the 1970s, Soviet-trained Afghan pilots flew Soviet-built aircraft, especially MiG-21 fighters and Mi-8 helicopters. Both aircraft types became mainstays in the Afghan inventory, and two decades later they were flown by the air forces of the Taliban and other factions then vying for control of the country. (The current Afghan 'workhorse,' the Mi-17 helicopter, is an upgraded version of the Mi-8; in recent years most senior leaders in the Afghan Air Force have been former MiG-21 or Mi-8 pilots, all of whom completed pilot training under the Soviets).³

Such were a few indicators of a thoroughly sovietized Afghan air service marked by the 'stovepiping' of information and decision-making generally at the highest levels. From the mid-1980s when the Afghans possessed up to 400 or more aircraft – including significant numbers of fighters, transports, light bombers, and helicopters – to the end of the following decade when perhaps only a few dozen fixed-wing and helicopter types remained flyable in Afghanistan, the training of new Afghan pilots dropped off even more precipitously than did the number of aircraft – apparently to zero by 1992, when the Afghan communist government fell to mujahideen warlords. The several Afghan factions, including after 1994 the Taliban, managed to keep a small number of aircraft flying, and almost all Afghan military pilots were the products of the Soviet training system. A decade later when the U.S. military began to assess the human materiel available for rebuilding an Afghan air force, it found that nearly all the eligible former pilots were Soviet-trained Afghan aviators mostly in their forties. Moreover, nearly all were considered limited to day-time flying under visual flight rules, or VFR.⁴

Following the reestablishment of a friendly Afghan government in Kabul in 2002, it was 2005 before U.S. Secretary of Defense Donald H. Rumsfeld directed the development of an Afghan presidential airlift capability which initially was the lone objective for American air planners. By 2006, a few U.S. Army aviators based in Kabul, led by Col. John T. Hansen, conducted Mi-17 training flights with Afghan pilots on an ad hoc basis. Later that year, a U.S./coalition plan for the Afghan National Army Air Corps began to take shape. This plan, based on Hansen's work, became the basis for the U.S.-led Combined Air Power Transition Force-Afghanistan (CAPTF-A), activated in the spring of 2007, whose mission was to "set the conditions for a fully independent and operationally capable" air corps to meet Afghanistan's security needs (the term "independent" referred to the capability to conduct operations without outside assistance, not to the status of a separate service).⁵

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Brig. Gen. Givhan with Maj. Gen. Mohammad Dawran, commander, Afghan National Army Air Corps (later, Afghan Air Force), at Kabul, Afghanistan. Dawran, a former MiG-21 pilot, had been trained as a cosmonaut by the Soviets.



IN THE SPRING OF 2009 THE FIRST GROUP OF AFGHAN PILOT-CANDIDATES IN SEVERAL DECADES HAD TRAVELED TO THE UNITED STATES

Organizationally, the initial plan envisioned three 'wings' – one for presidential airlift and two others, one rotary-wing and one fixed-wing. Meanwhile, the early 2006 International Conference on Afghanistan produced what was known as the Afghanistan Compact calling for an Afghan Air Corps of 7,000 members carved out of the much larger Afghan national army.⁶

When in 2007 the CAPTF-A began its work in Kabul, the Afghan Air Corps possessed about two dozen aircraft. Coalition partners agreed to provide additional rotary- and fixed-wing aircraft to the fledgling air corps, led by the United Arab Emirates (U.A.E.) and the Czech Republic which together contributed thirteen additional Mi-17 helicopters by 2008. Ukraine donated three An-32 fixed-wing transports, refurbished with U.S. funding. While aircraft donations by coalition partners were significant at the outset, within the next several years the assistance of those nations' Mi-17 instructor pilots became equally critical in the training of Afghan pilots.⁷

In the spring of 2009 the first group of Afghan pilot-candidates in several decades had traveled to the United States to begin English language training followed by undergraduate pilot training, or UPT. Some sixty Afghans were slated to undergo fixed- or rotary-wing UPT; about thirty who were already qualified as fixed-wing pilots were to complete instrument training before returning to Afghanistan. Additionally, four Mi-17 pilots and three flight engineers were to attend instructor training. As some of the Afghans were settling in to their new surroundings in San Antonio, Texas, in June 2009 the first of the modern-era's U.S.-trained Afghan pilots, Lt. Faiz Ramaki, earned his wings at Columbus AFB, Mississippi.⁸

By early 2011 more than thirty coalition partners provided personnel to assist the U.S. in the 'train-and-advise' mission for the Afghans. At Kabul and Kandahar, two of the three major Afghan air installations – the other was at Shindand – former Eastern European Mi-17 instructors proved invaluable to the training of Afghan airmen. At Kandahar, most of the one dozen air advisors from Lithuania, Ukraine, and Latvia had been trained in the Mi-17 under the Soviet system. At the time, Col. Michael R. Outlaw, a special operations C-130 pilot, commanded the U.S. Air Force's air advisory group there, part of the 438th wing that bore the dual designation of the NATO Air Training Command-Afghanistan (or, NATC-A, which merged with CAPTF-A). Colonel Outlaw's group was charged with training Afghan airmen in Mi-17 operations as well as in various ground support specialties from airfield firefighting to medical support to communications to managing a dining facility.⁹

Outlaw recalled that the first commander of the coalition air advisor team at Kandahar, a Lithuanian pilot who arrived early in 2011, "had trained under the Soviet system prior to the [Berlin] Wall falling down and Lithuania [kind of] 'westernizing.'" He had experienced firsthand "the pain" of the Soviet system but then following the dissolution of the Warsaw Pact he had also undergone additional training under a westernized system. "So he could identify and bridge the gap because all [that] the Afghans knew was the Soviet system," Colonel Outlaw recalled. The Lithuanian instructor pilot provided the Afghans with firsthand experience as to why a Western/U.S.-style training and command-and-control system that emphasized institutionalized procedures and also allowed for individual pilot and aircrew initiative and decision-making was better than the Soviet system. Moreover, the

Here is then-Capt. Antanas "Tony" Matutis, Lithuanian Air Force, an Mi-17 instructor pilot based at Kandahar, picture taken near Bastion, Afghanistan, June-July, 2011. (Photo courtesy of Maj. Antanas Matutis.)



Lithuanian spoke with the Afghans in Russian which many of the older Afghan airmen spoke. That was a considerable advantage because none of the American pilots spoke Russian and few of the Afghans spoke more than a basic level of English.¹⁰

But even a unique perspective communicated

to the Afghans in Russian may not have been sufficient to convince some pilots in the Kandahar Air Wing to embrace fully the Western/U.S.-style training (perhaps the use of Russian made such a prospect counterintuitive?). In the fall of 2011, the Lithuanian instructor who commanded the coali-

Brig. Gen. Givhan teaching English to Afghan officers.





THE TRADITIONAL PRACTICES OF AFGHAN AVIATORS... INCLUDED A "PERSONAL-BASED MISSION GENERATION SYSTEM"

tion air advisor team informed Colonel Outlaw that although the Afghans had begun using the Western-based training system, "they were keeping their own Russian-style training system" basically in their 'hip pocket.' Presumably, this had been the case since the beginning of training at Kandahar (the group had been activated in late 2009), but it took the Lithuanians' collective ability to discern what the Afghans meant when they said certain things and then doing some 'digging' on their own to discover that the Afghans were keeping their own system for future use in spite of current Afghan regulations that dictated the adoption of the Western system.¹¹

Recalling that the older Mi-17 pilots had flown that particular helicopter for many years, the system the Afghan Mi-17 pilots at Kandahar were keeping in their hip pocket may have amounted simply to the intent to return to relying mostly on memory and handwritten notes in lieu of practicing consistent checklist discipline, conducting standard aircrew briefings, and keeping detailed aircraft maintenance records. Moreover, the traditional practices of Afghan aviators (regardless of locale) included a "personal-based mission generation system" whereby the Afghan unit commander or another senior leader tasked individual aircrews for specific missions. While such an informal system was adequate for a small number of flyable aircraft conducting only a few sorties daily, it was inadequate for a larger fleet such as the one U.S./coalition air planners anticipated for the Afghans in the coming years. Moreover, the personal-based command-and-control system often upset the top priorities of U.S./coalition air advisors with the Afghans: 1), supporting Afghan army units' battlefield mobility

requirements; and, 2), conducting aircrew training.¹²

Among the issues raised by the Lithuanians' discovery at Kandahar, one was the importance of the English language skills of Afghan airmen. While the U.S./coalition partners developed numerous English programs – English being the language of aviation – they encountered serious challenges. The traditional low literacy rate in Afghanistan was challenging enough. But an added difficulty was that Afghan Air Force recruits underwent basic training under the Afghan Army's oversight, and it was not uncommon for the more literate and promising recruits to be diverted from the Air Force to the Army. Lieutenant Colonel (later, Col.) Gregory A. Roberts, who commanded the U.S./coalition rotary-wing advisory squadron at Kabul from 2010-2011, recalled that English language skills seemed "more valuable on some level than flying skills," a conviction he reached after flying with the first two newly-minted Afghan pilots that returned to Afghanistan from their training in the United States. In comparison with nearly all of the older pilots, the young pilots were "remarkably more competent." Two issues related to the widely differing English and flying skills between the younger and older pilots were, first, personal jealousies that perhaps were anticipated to some degree; and, second, the reluctance of Afghan Air Force unit leadership in some cases to allow their young pilots to fly, which may not have been anticipated. Indeed, at least a few newly-qualified Afghan pilots, upon their return home, were assigned to *non-flying jobs* despite the American advisors' counsel otherwise.¹³

Among those Afghans that had traveled to the U.S. for language training to be followed by flight

Brig. Gen. Walter D. Givhan, 438th Air Expeditionary Wing (438 AEW)/Combined Air Power Transition Force (CAPTF)-Afghanistan commanding general, with Afghan air cadets, Sept. 2008-Sept. 2009.



BY LATE 2011, SOME FIFTY AFGHANS WERE UNDERGOING ENGLISH TRAINING AND A DOZEN WERE IN PILOT TRAINING

training, a number proved to be a 'flight risk' – going AWOL, or absent-without-leave, most attempting to get into Canada. Although AWOLs were not an uncommon occurrence, the November 2009 jihadist attack at Fort Hood, Texas, raised the level of concern for Afghan officers that fled from their training programs. That unfortunate though not entirely unanticipated trend facilitated a U.S.-U.A.E. plan whereby eighty Afghan pilot-candidates would undergo their training in the Emirates. By late 2011, some fifty Afghans were undergoing English training and a dozen were in pilot training in the U.A.E. In addition, in 2010 the NATO Air Training Command-Afghanistan established an English-immersion program at the Kabul air base intended for pilot-candidates to learn English before leaving their homeland for pilot training. Known as the 'Thunder Lab,' the program was the single most visible and highly acclaimed NATC-A initiative in late 2010 and early 2011. In January 2011, the Air Force chief of staff, Gen. Norton A. Schwartz, devoted the bulk of his visit with the 438th wing to the Thunder Lab.¹⁴

The first part of 2011 was a promising period. In January, the first Afghan student-pilots flew Mi-17 training sorties at the former Soviet air base at Shindand, the installation intended as the key node in the country for initial pilot training. In February, the first two Afghan Mi-17 aircraft commanders graduated at Shindand, and a month later the first Afghan Mi-17 instructor pilot flew with a student-pilot there. Also in March, the first two all-Afghan Mi-17 helicopter movements of the President of Afghanistan took place, which U.S. advisors monitored from the control tower at Kabul. Also, the first two Fort Rucker, Alabama-trained

helicopter pilots completed their initial Mi-17 copilot certifications at Kabul following an intensive month of training under the Croatian air advisors – generally acknowledged as the best Mi-17 instructors in the world. In April, the first Afghan Mi-17 instructor pilot in the Afghans' Kandahar Air Wing passed his flight check – which was administered by the Kandahar rotary-wing advisory squadron commander, Lt. Col. (later, Col.) Fred C. Koegler. By the fall of 2011, a total of five Afghan fixed-wing pilots had completed the entire training course from pre-flight to earning their pilot wings and eleven had accomplished the same feat as newly-minted rotary-wing pilots.¹⁵

But the spring of 2011 was marred by a treacherous attack on April 27, carried out by an Afghan lieutenant colonel at the Kabul air base. Nine Americans were killed – eight were U.S. Air Force members of the 438th wing – a tragic reminder of the inherent risks of close quarters training with foreign nationals of uncertain loyalty especially within a broader context that could not rule out the possibility of corruption as a contributing cause. In 2013, one reinvestigation of the attack referred to "the AAF [Afghan Air Force] Criminal Patronage Network (CPN)." The April 27 attack against those remembered lovingly by many as the 'NATC-A Nine' had been the worst single incident loss of U.S. Air Force life in a deployed location since the Khobar Towers bombing in 1996. While the several force protection measures of the 438th wing's vice commander, Col. William D. Andersen – including a 'buddy-system,' team radios, a wing operations center, and a heightened weapons status – did not prevent the attack, they undoubtedly mitigated the

A social gathering with a senior Afghan Air Corps leader. The young man on far right was Brig. Gen. Givhan's cultural advisor/interpreter-translator.



THE TENDENCY OF SENIOR AFGHAN OFFICERS AND HIGH GOVERNMENT OFFICIALS TO TASK FLYING UNITS UNDER THEIR CONTROL WITH AIRLIFT MISSIONS,... MADE... ATTEMPTS TO FOCUS ON TRAINING AFGHAN PILOTS MORE DIFFICULT

immediate post-attack response and facilitated a far more orderly scenario than what might have unfolded only three weeks earlier when Andersen arrived at Kabul.¹⁶

The tendency of senior Afghan officers and high government officials to task flying units under their control with airlift missions, sometimes on very short notice and on occasion of questionable legitimacy, made U.S./coalition advisors' attempts to focus on training Afghan pilots more difficult than it needed to be, especially at Kabul where senior officials abounded. Two successive U.S. Air Force commanders of the 438th wing's helicopter advisor squadron there, Greg Roberts and Lt. Col. John P. Conmy, recalled that often the Mi-17s were tasked with missions to include hauling passengers with political or tribal connections to senior leaders or to deliver various supplies including livestock, toilet paper, or firewood. While some items may have raised the eyebrows of Western/U.S. airmen, they were legitimate missions in an Afghan context especially in support of Afghan army units that endured harsh field conditions and engaged in combat operations. But in a few cases, the Mi-17s flew more questionable cargo. On at least two occasions in 2010-2011, unidentified packages flown by Afghan Mi-17 crews were spirited away immediately by motorcycles upon the helicopter's landing at a remote airstrip. On one mission, U.S. airmen who observed the scenario from another Mi-17 noticed that crates of rice and fruit were left on the tarmac as the unidentified cargo was carried off by the motorcyclists.¹⁷

While the production of Mi-17 pilots was the foremost pilot training concern of U.S./coalition

advisors in terms of the numbers required, the struggles and eventual failure of the Afghan Air Force's C-27A Spartan airlifter program warranted attention as well. The air planners intended for the C-27 – also known as the Aeritalia G.222 – to replace the medium-sized Antonov transports that the Afghans had flown for decades, the An-26 and An-32. By 2011, all the Afghan tail numbers of those aircraft types had reached the end of their programed flying time and were no longer funded by U.S./coalition partners.¹⁸

The air campaign plan called for a total of twenty Spartans, the first two of which arrived in Kabul late in 2009. By early 2011 one-half of the C-27s had arrived, with a final tally of sixteen Spartans reaching Kabul before the program was discontinued at the end of 2012.¹⁹ While the U.S./coalition plan anticipated that a small number of selected, and older, Antonov pilots would travel to the United States first to improve their English, and then to undergo instrument flight training, those were not the pilots envisioned to become the foundation for a new Afghan Air Force. The greater interest was to train young Afghan pilot-candidates in the United States – like Lieutenant Ramaki – and return them to Afghanistan as qualified fixed-wing pilots who would then get checked-out in the C-27. But in the spring of 2011, if not generally, operational support missions rather than training took center stage, although the two were combined as much as possible. Coupled with an unacceptably low mission-capable rate for the Spartans – in early February 2011 no more than three C-27s typically were mission-capable on a given day – training took a 'back seat.' An ongoing shortage of C-27 aircraft

The start-up of rocket training for Afghan Mi-35s (the upgraded Mi-24 Hind).
(Photo courtesy of the 438 AEW History.)



THERE HAVE BEEN POCKETS OF SUCCESS AND BEACONS OF HOPE, BUT THERE HAVE ALSO BEEN VALID REASONS FOR CONCERN

parts and reported problems in customer service from the manufacturer contributed to the announcement by U.S. officials at the end of 2012 that the aircraft's support contract would not be renewed. Even so, in March 2011 two Afghan C-27 pilots were certified to fly under U.S. Air Force supervision.²⁰

Beginning in the fall of 2011 a smaller airlifter program, the Cessna C-208B Caravan, substituted to a degree for the faltering C-27 Spartans. Between October 2011 and December 2012, the Afghans received a total of twenty-six C-208 Caravan aircraft, employing them mainly for the airlift of troops and supplies, medical evacuation,

and transport of human remains in accordance with Muslim cultural requirements.²¹

In short, the final chapter of the training of Afghan Air Force pilots in the post-9/11 era has not been written. There have been pockets of success and beacons of hope, but there have also been valid reasons for concern as to how things will turn out in the end. As the Pentagon's Inspector General stated, "Air power is critical to the mobility of the Afghan National Security Forces, and NATC-A officials are striving to increase the Afghan Air Force's ability to plan and conduct operations in defense of their country." Only time will tell if they are able to succeed.²² ■

NOTES

1. Forrest L. Marion, "The Destruction and Rebuilding of the Afghan Air Force, 1989-2009," *Air Power History*, vol. 57, no. 2 (Summer, 2010), p. 24.
2. Leon B. Poullada and Leila D. J. Poullada, *The Kingdom of Afghanistan and the United States: 1828-1973* (Lincoln, Neb.: Center for Afghanistan Studies, University of Nebraska at Omaha, and Dageforde Publishing, 1995), pp. 108-110, 180-81; Marion, "Destruction and Rebuilding of the Afghan Air Force," pp. 24-26. In April 2009, the author interviewed Colonel Tayer in Kabul and attended his address to the Afghan airmen.
3. Marion, "Destruction and Rebuilding of the Afghan Air Force," p. 24.
4. Marion, "Destruction and Rebuilding of the Afghan Air Force," 24-26; Hist, 438 AEW, Mar. 1, 2009-Apr. 30, 2009, narrative, 15, and Case File (CF) 02, brf, "Afghan National Army Air Corps (ANAAAC)," Mar 2009, slide 27, AFHRA call number K-WG-438-HI (AEW) CD, Mar. 1, 2009-Apr. 30, 2009. Author Steve Coll describes 'Northern Alliance' leader Massoud's air

force by the late 1990s as "a few tattered helicopters pasted together from incompatible spare parts and with rotors that continually threatened to detach and fly away"; see Coll, *Ghost Wars: The Secret History of the CIA, Afghanistan, and Bin Laden, from the Soviet Invasion to September 10, 2001* (New York: Penguin Books, Inc., 2005), p. 460.

5. Marion, "Destruction and Rebuilding of the Afghan Air Force," p. 27, including quote.

6. Marion, "Destruction and Rebuilding of the Afghan Air Force," p. 27.

7. Hist, 438 AEW, Mar. 1, 2009-Apr. 30, 2009, narrative, pp. 16-17.

8. Hist, 438 AEW, Mar. 1, 2009-Apr. 30, 2009, CF 02, slides, "CSTC-A Commander's Update," Apr. 30, 2009; Sonic Johnson, "Afghan Officer earns USAF Wings," *Air Force Print News Today*, Jun. 13, 2009, at www.columbus.af.mil/news/story_print.asp?id=123154059 (May 25, 2015). In 2013 the first known Afghan female pilot to complete flight training in Afghanistan earned her wings; see Kristina Wong, "Afghan Air

Force graduates first female pilot in 30 years,” *Washington Times*, May 14, 2013, at www.washington-times.com/news/2013/may/14/afghan-air-force-graduates-first-female-pilot-30-y/ (Feb. 21, 2015). The pilot was Lt. Niloofar Rhmani. She graduated from Cessna C-182 training at Shindand AB along with four male fixed-wing pilots and eight rotary-wing pilots who trained on the MD-530 helicopter.

9. Intvw, Col. Michael R. Outlaw, USAF, and Col. Daniel E. Blake, USAF, by F. L. Marion, AFHRA, Sep. 24, 2013 (original at AFHRA, transcribed). One of several oddities with the coalition effort was that despite the oft-used ‘NATO’ designation, there were several non-NATO participants who fell under the International Security Assistance Force (or, ISAF), including Mongolia who contributed an Mi-17 engine and body maintenance team; see doc, 438 AEW, “Significant Events Chronology, Jan-Feb 2011, Mar 2011, Apr 2011,” entry for Jan. 1, 2011 AFHRA, Maxwell AFB, Ala.

10. Outlaw intvw, including quotes.

11. Outlaw intvw, including quote. Probably either the Lithuanian pilot advisor or Outlaw (or both) conflated the regimented, stovepiped Soviet system with the ad hoc, personal-based Afghan system that enjoyed freer reign in the 1990s at the end of the long period of Soviet domination of Afghan air service issues. While the Afghans may have blended elements of the Soviet system with Afghan ad hoc personalism, the main point was that the Afghans were reluctant to adopt the Western/U.S. system.

12. Intvw, Col. Fred C. Koegler, USAF, by F. L. Marion, AFHRA, Apr. 16, 2015 (AFHRA, intvw not transcribed); intvw, Col. Gregory A. Roberts, USAF, by F. L. Marion, AFHRA, May 19, 2015, including quote (AFHRA, intvw not transcribed).

13. Telecon, Lt. Col. Gregory A. Roberts, USAF, with author, Mar. 5, 2015, including quotes; intvw, Lt. Col. John P. Conmy, USAF, by F. L. Marion, AFHRA, Sep. 22, 2014 (AFHRA, intvw not transcribed); personal observations as 438th historian, Feb-May 2011.

14. James C. McKinley, Jr., “Afghan Soldiers Went AWOL in Texas,” *New York Times*, Jun. 30, 2010; *Improved Pricing and Oversight Needed for the Afghan Air Force Pilot and English Language Training Task Order*, pp. 2, 13, at www.dodig.mil/audit/reports/fy11/11-113.pdf (May 22, 2015); Carol Huang, “Afghanistan’s new armed forces receive training in the U.A.E.,” *The National*, U.A.E., Oct. 21, 2011, at www.thenational.ae/news/uae-news/afghanistans-new-armed-forces-receive-training-in-the-uae (May 23, 2015); brfg, NATO Training Mission-Afghanistan (NTM-A), “DCOM-Air,” slide 11, entitled “Training Outside Afghanistan,” ca. Nov. 2011 (electronic copy provided to author by Capt. C. C. Felker, USN, Feb. 18, 2015). Felker served as historian for the Combined Security Transition Command-Afghanistan (CSTC-A), in Kabul during 2011. Starting in 2009, English Language Training was conducted at San Antonio, Tex. The task order for the training in the U.A.E. called for 80 Afghan pilots, proficient in aviation-English, by October 2013.

15. Roberts interv; Koegler interv; doc, 438 AEW, “Significant Events Chronology, Jan-Feb 2011, Mar 2011, Apr 2011,” entries for Jan, 8, Feb. 14, Mar. 22, Mar. 29, and Apr. 12, 2011; brfg, NTM-A, “DCOM-Air,” slide 12, entitled “AAF/AIU Aircrew Development Status: Oct11.”

16. Report, AR 15-6 *Investigation, Green on Blue Incident at Kabul Int’l Airport*, Nov. 1, 2013, Report of

Investigation, Finding 01, including quote (copy at AFHRA); personal observations as 438th historian, Feb-May 2011; interv, Col. William D. Andersen, USAF (Retired), by F. L. Marion, AFHRA, May 6, 2015 (AFHRA, intvw not transcribed); intvw, Maj. Melissa Moon-Brown, USAF (Retired), by F. L. Marion, AFHRA, Apr. 25, 2013 (original at AFHRA, transcribed). On April 27, 2011, Colonel Andersen acted as wing commander in the absence of Brig. Gen. David W. Allvin who was returning to Kabul from the United States at the time.

17. Doc, 438 AEW, “Significant Events Chronology, Jan-Feb 2011, Mar 2011, Apr 2011,” entries for Mar. 11 and 18 2011; Roberts interv; discussions with Lt. Col. Mark R. (last initial only) (in 2011), Lt. Col. Conmy (in 2014), and Lt. Col. (later, Col.) Roberts (in 2015). In 2012, the U.S. Government began an investigation into the possibility of Afghan Air Force aircraft being used to transport narcotics; see Kay Johnson, “Afghan air force ascent slow, imperiling battle with Taliban,” *Reuters*, Jan. 25, 2015, at <https://ca.news.yahoo.com/afghan-air-force-ascent-slow-imperiling-battle-taliban-222810844.html> (May 23, 15).

18. Doc, 438 AEW, “Significant Events Chronology, Jan-Feb 2011, Mar 2011, Apr 2011,” entry for 30 Mar 11. By the summer-fall of 2011, none of the Antonov transports were funded by the U.S./coalition; if they were flown, it was entirely an Afghan undertaking.

19. Doc, 438 AEW, “Significant Events Chronology, Jan-Feb 2011, Mar 2011, Apr 2011,” entry for 20 Feb 11. The last four C-27s intended for Afghanistan were not delivered but remained in Europe. In 2014 the Afghan C-27 fleet was sold for scrap metal; several articles highlighted the fact that nearly one-half billion dollars had been wasted on the C-27 program. Not to excuse but to place in perspective, compare the C-27 program with the failed Defense Integrated Military Human Resources System (DIMHRS), a DOD pay/personnel system that consumed more than \$800 million between 1998 and program termination in 2010; see GAO-05-189.

20. Doc, 438 AEW, “Significant Events Chronology, Jan-Feb 2011, Mar 2011, Apr 2011,” entries for 8 Feb 11, 24 Mar 11; SAJAD, “Afghanistan welcomes cancellation of Italian-made planes,” *Khaama Press*, 29 Dec 12, at <http://www.khaama.com/afghanistan-welcomes-cancellation-of-italian-made-planes-2077> (22 May 15). Ramaki became the first Afghan C-27 pilot, completing his initial qualification on the aircraft in Feb. 2010; see Elizabeth Burke, “Airmen train Afghan National Army Air Corps’ first C-27 pilot,” *U.S. Air Force News*, 25 Feb 10, at <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/117516/airmen-train-afghan-national-army-air-corps-first-c-27-pilot.aspx> (23 May 15).

21. Agneta Murnan, “Afghan Air Force advances battlefield support tactics,” 438 AEW/NATC-A, *U.S. Air Force News*, 25 Jan 13, at <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/109808/afghan-air-force-advances-battlefield-support-tactics.aspx> (23 May 15); Jim Moore, “Afghan pilots complete training,” *Aircraft Owners and Pilots Association*, 18 Sep 13, at <http://www.aopa.org/News-and-Video/All-News/2013/September/18/afghan-pilots> (23 May 15); Michael A. Keltz, “Getting Our Partners Airborne,” *Air & Space Power Journal*, May-Jun 2014, 11, 15, 17, at <http://www.airpower.maxwell.af.mil/digital/pdf/articles/2014-May-Jun/SLP-keltz.pdf> (14 Feb 15).

22. *Improved Pricing and Oversight Needed*, 16, including quote.

FROM "OBSERVATION" TO "TACTICAL
RECONNAISSANCE:"
THE DEVELOPMENT OF AMERICAN
BATTLEFIELD ISR IN
WORLD WAR II





Chris Rein

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Despite being the first mission assigned to aviation assets in warfare, by the mid-1930s, the observation, or reconnaissance mission had fallen far behind the more glamorous fields of bombardment, pursuit and even attack in the U.S. Army Air Corps (soon to become the U.S. Army Air Forces). In his prescription for the composition of a modern Air Force, Brig. Gen. William “Billy” Mitchell advocated a mix of sixty percent pursuit, twenty percent bombardment and twenty percent attack, all supported by an auxiliary observation branch.¹ Despite Mitchell’s laying out of a comprehensive plan for the employment of observation aviation in *Our Air Force*, including photo processing and artillery correction, the branch of aviation dedicated to providing battlefield reconnaissance languished near the bottom of the AAF’s priority list. By 1940, most “observation” units, as they were then known, were flying the obsolescent O-47, primarily in National Guard squadrons geographically dispersed in areas where they could support the annual training exercises. Unsurprisingly, in their first test with the European axis, the observation branch was found wanting. By early 1943, Carl “Tooey” Spaatz, the senior American airman in the North African campaign wrote General Henry H. “Hap” Arnold, the Army Air Forces commanding general, “It is now evident that observation groups, as we know them, will never serve a useful purpose when the enemy is equipped and operates as the German air and ground forces (have) in this theater.”²

By late 1944, a remarkable renaissance had occurred in the observation branch. That autumn, no less than three full tactical reconnaissance groups were providing near-real time intelligence to both ground and tactical aviation units, greatly facilitating the Allied drive across France and into Germany. While the effort still suffered from glaring omissions, such as the development of a nighttime reconnaissance capability and processing bottlenecks that continue to plague the Intelligence, Surveillance, and Reconnaissance (ISR) community, tac recce, as it became known, had evolved into an effective and vital component of the ground-air team. The future USAF was so impressed that it retained specialized tac recce units throughout the Cold War, only dropping the adjective “tactical” after the long-overdue merging of the Tactical and Strategic Air Commands, which had each retained its own tactical and strategic reconnaissance assets and organizations. This remarkable recovery required the AAF leadership to first identify and

acknowledge the problem, and then to devise and implement corrective measures, all under the pressures of wartime conditions. They were fortunate to have the active assistance of the successful RAF model, honed in the Western Desert, as good an argument as any for the continued importance and relevance of coalitions comprised of diverse service and national cultures in modern aerial warfare. Airmen achieved this construction of “tac recce,” in the classrooms and on the training ranges of bases such as the AAF School of Applied Tactics (AAF-SAT) in Orlando, Florida, and the Reconnaissance schoolhouse at Key Field in Meridian, Mississippi. Their efforts have gone largely unexplored, but highlight a key development in the capability of modern ISR and provide a graphic example of the process of continual adaptation essential for success in air operations. They also emphasize the continuing relevance of proper training and correct organization in effective battlefield reconnaissance.

In 1956, Robert Futrell traced the collapse of the U.S. Army Air Force’s “observation” aviation branch in the North African campaign and the subsequent policy decisions that led to its replacement with Tactical Reconnaissance Groups in Northwest Europe.³ Futrell’s work explained the bureaucratic process that led to this development in mid-1943, but did not describe the process by which these groups were formed, trained or employed. He noted that the direct assignment of a single observation squadron to each ground division commander, and an observation group to each Army Corps, with three of the squadrons assigned directly to the divisions leaving one for corps use, as the ground officers had desired, was an ineffective construct that was finally eliminated with the publication of FM 100-20 in the summer of 1943. That document directed the centralization of all air assets under the air commander, who would then work closely with the ground commander in allocating assets and assigning missions that were of the highest priority to the theater commander. In 2007, Doug Gordon carried the story forward with a description of the “tac recce” groups that served the USAF admirably through the end of the Cold War, but provided only a brief (one page) summary of WWII-era developments.⁴ As a result, we are left with an incomplete history of the development of tac recce in the USAF during the mid- to latter stages of World War II.

In addition to monitoring the strength, disposition and progress of enemy (and eventually, friendly) forces, aircrews of the observation

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**WITHIN THE
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squadrons were also trained to adjust artillery fire, a role tactical reconnaissance aircraft continued to train in and excel at in the latter stages of the European war, despite the Army's development of indigenous “horsefly” very light liaison aircraft assigned directly to each artillery battalion, itself an experiment made successful only by the general air superiority the Allies had achieved over the front by the time they were employed.⁵ But the key piece of technology turned out to be the airborne camera, with its ability to capture detail far in excess of even the trained observer's eye and to be more widely reproduced and disseminated than a verbal or written report. It also minimized the threat to observation aircraft and led to designs that incorporated light, fast types that could enter and exit the battle area quickly, rather than slower types of long endurance who could loiter in the battle area. The reliance on aerial photography led the AAF to eventually install cameras in the most modern fighter types by 1944-45. Indeed, the 363rd Tactical Reconnaissance Group, discussed later, had two squadrons of the photo variant of the P-51 (F-6) and one squadron with photo-equipped P-38s (F-4s and F-5s). Both aircraft were still the AAF's front-line fighters at the end of the war, emphasizing the importance the AF placed on the mission by equipping units with the latest types.

Within the AAF establishment, the pre-war observation units had to compete with what the AAF then called “reconnaissance,” but which was actually what would become known as either “photographic” or “strategic reconnaissance.” These were aircraft intended to conduct pre-strike weather missions and post-strike bomb damage assessment missions. Again, for deep reconnaissance, the mission required a fast, long-range aircraft able to

ingress and egress the target area at high altitude with limited potential for being successfully intercepted. Lacking such an aircraft, the AAF initially assigned variants either of medium or heavy bombers to conduct these missions. When they proved unworkable, the service obtained British Mosquitos as an intermediate stopgap, until eventually settling on the F-4/5 and F-6s for this mission as well. These units became known Photographic Reconnaissance squadrons and groups but, as the requirements of both tactical and strategic reconnaissance began to merge, so too did the aircraft types and units assigned to conduct it.

In contrast to the later F-series of aircraft, the ungainly O-47 provided a three-person crew, with a pilot, visual observer and photographic observer. Windows below the extended cockpit permitted observation directly below the aircraft, but it was hardly survivable on a World War II battlefield as demonstrated by the plight of the TBD Devastator torpedo bombers, based on a similar three-person design, in the Battle of Midway. As the war began, most observation units were being reequipped with both A-20 Havocs (Bostons) and P-39 Airacobras, with most groups eventually operating two squadrons of each type of aircraft, but with some squadrons operating both types, as well as lighter liaison types, complicating logistics and repair requirements.⁶ When the 68th Observation Group deployed to North Africa for Operation TORCH, its four squadrons contained P-39s and A-20s, neither of which could survive over the battlefield without an escort. As a result, most were reassigned to anti-submarine scouting missions (the same fate suffered by most O-47s still back in the states) until the first F-4s could reach the frontline units. Only one squadron of the 68th Group, the 154th



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Observation Squadron, originally of the Arkansas National Guard, ever saw combat employment in its intended role. Despite the best efforts of its pilots it was unable to overcome the primitive airfields and poor February weather of Tunisia's Western Dorsales and provided poor support during the Kasserine battles.⁷

The 154th offers a detailed case study in the failure of the pre-war observation model. Despite being mobilized for federal service in September 1940, more than a year before Pearl Harbor, the unit still entered combat woefully unprepared to offer even the most basic support to the ground forces in Tunisia. The problem was two-fold: first, the unit spent much of the pre-war time on either basic preparation, such as honing flying and navigating skills, or, after the opening of the war, in coastal defense and reconnaissance. Second, the time spent training with ground units, which included participation in the Louisiana and Carolina maneuvers, was wasted on outmoded concepts of support and with a flawed communications network that prevented effective coordination.⁸ When activated in 1940, it was equipped with ten O-47s and two BC-1As, a light reconnaissance type, but had to complete a transition to the P-39 and A-20 over the next two years. Despite sending the ground echelon ashore shortly after the initial invasion, the air echelon did not arrive until over a month later, having survived a harrowing passage over the southern ferry route. Of thirty-six A-20s departing from the states, two crashed before reaching Puerto Rico, nine more were damaged en route and ten were strung out all along the African coast. The P-39s, coming from stocks assembled in the UK destined for Russia as Lend-Lease, also had difficulty reaching the theater, with several interned in still-neutral Portugal after

encountering stronger-than-forecast headwinds over the Bay of Biscay. On the ground, the 154th had more hard luck, when the squadron commander was "seriously injured in a motorcycle accident en route from Blida to Oudja," and his replacement had to be "relieved of command and transferred out of the organization" for some unspecified offense.⁹

When committed to combat, it still operated both types of aircraft, and did not become an all-P-39 squadron until January 9, 1943. On January 21, seventeen officers, thirty-three enlisted men and thirteen P-39s arrived at Youks les Bains to cover the II Corps front. They flew the squadron's first reconnaissance mission over the II Corps front on January 26, less than three weeks before the opening of the Kasserine battle. On February 2, it lost its first pilot when four FW-190s jumped two P-39s over Kairouan, the main Luftwaffe airfield in that sector and undoubtedly of more interest to the air than ground forces. The unit made good use of the aircraft's 37mm cannon on ground strafing missions but was unable to defend itself in the air, often requiring an escort of P-40s from Lt. Col. William W. "Spike" Momyer's 33rd Fighter Group. During this time it operated in primitive conditions at Youks-les-Bains, with aircrew living in tent-covered foxholes and where the mud was so bad that "you walk ten steps and your feet are as big as bushel baskets and weigh twenty-five pounds apiece." After several days of rain and hail, the camp became a "brown, gooey pudding of mud," preventing flight and flooding out many tents." After moving forward to Thelepte in early March, the squadron finally received its first P-51s and began to conduct and process photographic reconnaissance missions.

During its first month in Tunisia, the unit failed to detect the Axis thrust against the



A WEEK BEFORE THE KASSERINE BATTLE, THE ALLIES INITIATED A REORGANIZATION OF THE TWO AIR FORCES THEN OPERATING ON THE CONTINENT

American lines or play any significant part in helping the ground forces manage the battle or repel the assault.¹⁰ Army observation failed to detect the buildup opposite II Corps exposed positions at Faid Pass, then proved unable to track the progress of Rommel's panzers as they broke through the American cordon. Most American ground units obtained their information on German dispositions the old-fashioned way, by watching them crest a distant rise, often in superior numbers. Based on their poor showing in the campaign, Spaatz recommended that "no further effort be wasted in training and equipping observation groups as such for this or similar theaters. Our whole concept of support aviation has been altered radically by the past month's fighting in Tunisia."¹¹ The Army Air Forces certainly deserve some share of the blame for the American's poor showing in the battle.

Fortunately, help was on the way. A week before the Kasserine battle, the Allies initiated a reorganization of the two air forces then operating on the continent. The RAF's Western Desert Air Force, which had pursued Rommel from Egypt, had finally taken up positions in eastern Libya, within cooperating range of the Anglo-American forces in Algeria and Tunisia that had come ashore after TORCH. The effect was primarily to consolidate reconnaissance collection and processing in the North African Photographic Reconnaissance Wing (NAPRW), comprised of both British and American assets. Americans continued to focus on the strategic reconnaissance then identifying lucrative targets for the air superiority and interdiction campaigns while British GR-type aircraft collected, analyzed and distributed most of the battlefield intelligence.¹² Indeed, it was British aircraft of 225 Squadron who first detected Rommel's retreat, cross-cueing with

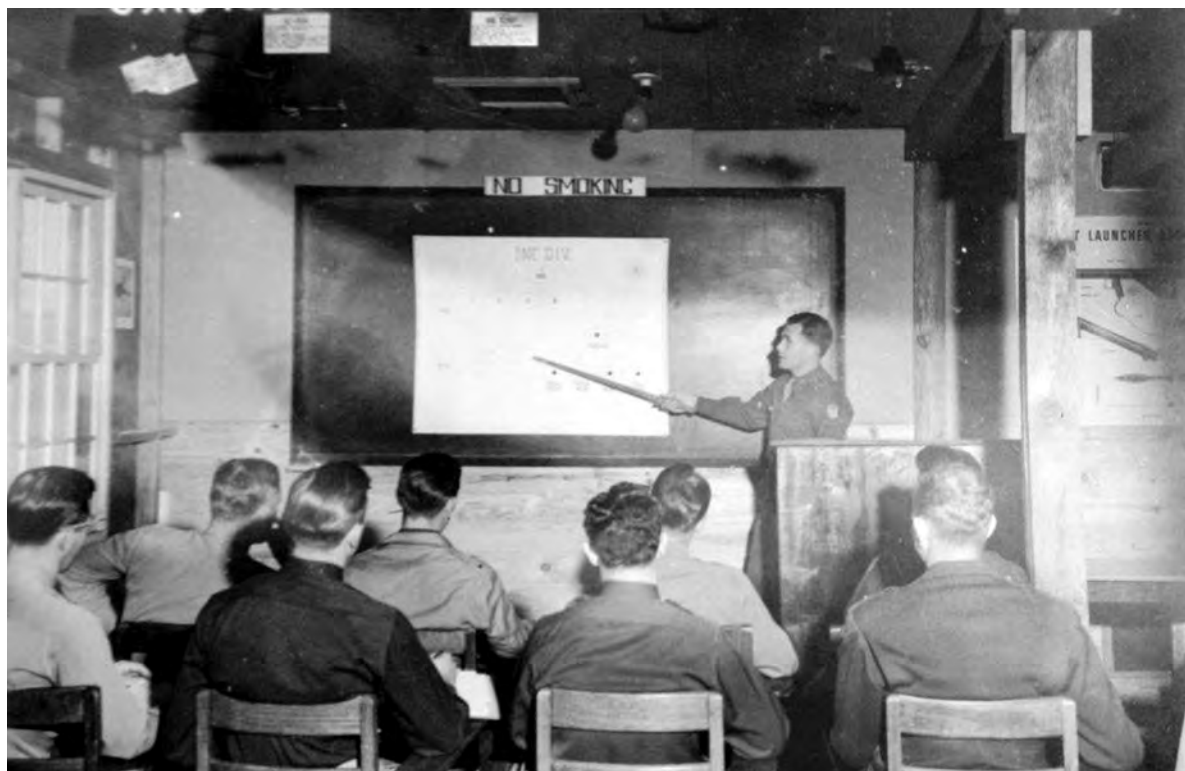
other RAF assets of Sir Arthur Coningham's Northwest African Tactical Air Force (NATAF) to strike them as they returned to the Mareth Line.¹³ The 3rd Photo Group had been employed almost exclusively in providing photographic reconnaissance for the XII Bomber Command, with the false expectation that the poorly-equipped observation squadrons would be sufficient for the ground commander's needs. Perhaps it was a fortunate division of labor to have the RAF assume control of tactical reconnaissance, which it had a great deal of experience in, and permit the AAF to conduct strategic reconnaissance, as the RAF was not yet operating a large heavy bomber force in the theater. Ideally, though, photographic assets should have been employed to meet the needs of both the ground and air force commanders. The ground side already felt shorted and some commanders became "suspicious that the Air Force used more than its share of the reconnaissance effort upon such projects as bomb damage assessment."¹⁴

Coningham's American deputy, Brigadier General Laurence Kuter, later one of the principal authors of FM 100-20, sounded the death knell for observation aviation when he wrote just after the end of the campaign:

Ineffectiveness of observation groups should be accepted as proved in this theater and maximum effort should be made to elevate the position of our present observation aviation to a much higher level by the immediate formation of truly proficient tactical and strategic reconnaissance squadrons¹⁵

Fortunately, the AAF heeded Kuter's suggestion and began the immediate rehabilitation of the failed observation squadrons.

Tactical Reconnaissance Ground School, Key Field, Meridian, Mississippi. Pilots are given basic instruction on the components and weapons of a typical infantry division.



THE WAR DEPARTMENT ORDERED A NAME CHANGE FROM "OBSERVATION" TO RECONNAISSANCE" ON APRIL 2, 1943

Unfortunately, they also heeded his call for segregation into the tactical and strategic arenas, which introduced unnecessary stovepipes into the intelligence architecture. FM 100-20 attempted to make the distinction clear. Under "Types of Tactical Aviation" it listed, after Bombardment and fighter, but ahead of troop carrier:

c. Reconnaissance aviation is the term applied to air units which perform the service of information for military¹⁶ commands. The function of reconnaissance aviation is to secure information by visual and photographic means and to return this information for exploitation.

d. Photographic aviation is the term applied to air units which perform photographic reconnaissance missions beyond the responsibilities or capabilities of reconnaissance aviation and special photogrammetric mapping missions for engineer topographic troops.¹⁷

The distinction was likely insufficiently clear, prompting the AAF to add the word "tactical" to the "reconnaissance" function and redesignating all of its reconnaissance groups and squadrons as "tactical reconnaissance." Photographic squadrons and groups continued to be assigned to both tactical and strategic organizations. The segregation reflected AAF thinking outlined in Field Manual 1-20, "Tactics and Technique of Air Reconnaissance and Observation," published in 1942, which the new FM 100-20 referenced. The earlier field manual was broken up into three sections: a short primer on air reconnaissance, a longer section titled "Air reconnaissance for air force aviation," and a shorter section labeled "Air reconnaissance and observation for ground forces."¹⁸

A joint ground-air review board on observation aviation recognized that a name change was urgently needed, as the term "observation" was both associated with the limited roles for aircraft as used in the Great War, and brought to mind the obsolescent types assigned and penurious budgets of the interwar years. The board found "it is evident that observation suffers from a psychological disadvantage in that this term, over a long period of time, has been associated with a dearth of equipment and such low priorities as to prevent any progress." In addition to providing a more accurate description of the roles and missions assigned, the name also offered the potential to signal a renewed emphasis and interest in the importance placed upon this vital arm. The War Department ordered a name change from "observation" to reconnaissance" on April 2, 1943, with the additional adjective "tactical" added later in the year.¹⁹

In addition to realizing that it had a serious problem on its hands, the AAF also became aware that it lacked an institutional mechanism for addressing it. The Air Corps Tactical School, whose faculty and students might have been capable of devising a workable solution, had been suspended in 1940, as the service embarked on a crash buildup prior to the war. The new AAF School of Applied Tactics, established the same month as the TORCH landings, received the initial assignment from the air staff to address the problem and devise a workable solution. The staff at AAFSAT recognized that, in addition to improved types, the new units would require specialized training in tactical reconnaissance techniques, as well as a schoolhouse to provide training. Robert Futrell expertly picks up the story here, tracing the process by which the 154th Observation Squadron's commander, Lt. Col. John



**THE AAF
LEADERSHIP
DESIGNATED
3RD AIR
FORCE...TO
SERVE AS
THE FOCAL
POINT FOR
RECONNAIS-
SANCE
TRAINING**

Dyas and a South African Air Force expert, Lt. Col. E.A. Biden, made the case to AAFSAT for adoption of the British model. Once codified, the new doctrine only had to be taught to the next generation of tac recce pilots who would eventually complete that training in a two-month course operated at Key Field, near Meridian, Mississippi, under a confusing variety of names.

As a result of the work conducted at AAFSAT, the AAF leadership designated 3rd Air Force, geographically distributed across the southeastern quarter of the United States, to serve as the focal point for reconnaissance training. On August 18, 1943, 3rd Air Force established the III Reconnaissance Command, previously the III Air Support Command, headquartered at Birmingham, Alabama, and charged the unit with "training all tactical and photographic reconnaissance units and operation of replacement training units for crews of such units."²⁰ Key Field would host the tactical reconnaissance wing, numbered the 88th, while the 89th Wing at Will Rogers field near Oklahoma City would conduct photographic reconnaissance training. The comparatively better weather on the dryer Great Plains supported visual photographic training, while Key Field was conveniently located to the Carolina, Tennessee and Louisiana maneuver areas to maximize training with ground forces also preparing for deployment overseas.

The Will Rogers wing trained photographic squadrons and aircrew for both the strategic effort as well as assignment to the new tactical reconnaissance groups (TRG), while the Key Field contingent focused on the tactical reconnaissance squadrons (TRS). The new group would ideally have two squadrons of the latter type, specializing in both low-

level photography as well as the old observation mission, and one of the former, providing more detailed coverage further behind the front. One TRG would be assigned to each Tactical Air Command (TAC), insulating it from the demands of the strategic bombing force and ensuring that it remained responsive to the ground commander's needs and desires.

Within the 88th Reconnaissance Wing at Key Field, the 75th Reconnaissance Group conducted most of the training. Within its three squadrons, the 21st, 30th and 124th Reconnaissance Squadrons, classes of roughly thirty students rotated through. The 21st's class 43B divided into two groups, conducting aerial and classroom instruction, respectively, in the morning, then switching after lunch. In this manner use of the squadron's small number of assigned aircraft (five P-39s, fourteen P-40s and four P-51s) and ten instructors from various theaters could be maximized. The six-week course (later extended to eight during the winter months of shorter days and poorer flying weather) began with cockpit and local area familiarization, then moved into a period of navigation training before specializing in artillery adjustment and reconnaissance missions. The training also included formation flying (necessary when working in teams of two), fighter tactics and aerial and ground gunnery, for self-protection and to engage fleeting targets. Pilots frequently trained with ground units at nearby Camp Shelby, Mississippi, which trained ground units prior to overseas movement, including the 65th and 69th Infantry Divisions. Two British officers, Major Underdown and Major Powell, Air Liaison Officers who had served with Eighth Army in North Africa, provided lectures on the vital role of the Ground Liaison Officer in each squadron, who would keep



Brig. Gen. Arthur B.
McDaniel

the pilots abreast of changes in the ground situation and funnel intelligence back to the ground commanders. Later both men would serve as instructors at a special GLO school at Meridian. The U.S. Army conducted similar training for Air Liaison Officers at its ALO school at Fort Benning, Georgia.²¹

By October of 1943, the new organization was running well enough to prompt a letter from General Arnold to Brig. Gen. Arthur McDaniel, commanding the III Reconnaissance Command at Birmingham. McDaniel had been intimately involved in the entire effort, and had earned one of the first Distinguished Flying Crosses awarded for his service on the famous Pan-American flight from December 1926-May 1927. Arnold's letter read:

The outstanding work you have done in reorganizing the Reconnaissance program of the Army Air Forces is most pleasing to me, and I desire to commend you for the efficient and conscientious manner

in which you have performed this assignment.

With the merging of Photo Reconnaissance and tactical Reconnaissance many problems arose which had to be solved as rapidly and expeditiously as possible. Your task consisted of establishing a Reconnaissance branch in this Headquarters for Staff purposes, reorganizing the Reconnaissance Command of the Third Air Force, and developing necessary facilities for training both types of Squadrons. In addition, it was necessary to devise policies and procedures for the use of Reconnaissance Units during combat and to set up new Tables of Organization according to the needs which have arisen under combat situations

*Your thorough understanding of the part Reconnaissance plays in the warfare of today and your ability to interpret this knowledge into a definite program reflects great credit upon yourself.*²²

Unfortunately, the AAF lost the services of this acknowledged expert in tactical reconnaissance when he suffered a fatal heart attack at his home in Mountain Brook, Alabama on December 26, 1943.

By late 1943, tactical reconnaissance doctrine had been clearly defined and was being disseminated throughout the services. The AAFSAT hosted a number of Army-Navy Staff College (ANSOL) courses designed to educate ground and naval officers on AAF capabilities. The course materials for Class 1943 C, held September 8 to October 2 in Orlando, reveal a maturing tactical reconnaissance capability. The chapter on tactical reconnaissance opined that "Tactical Reconnaissance is essentially a new type of aviation. It has officially come into being since July 1, 1943...it was born of combat experience in the Western Desert and Tunisia." The text frankly admitted that "Observation Aviation as organized was not capable of performing that function under combat conditions of modern warfare—such conditions as existed in Tunisia and will probably exist to an even greater extent on the European continent. Aircraft cannot operate as elevated observation posts against an enemy plentifully equipped with effective anti-aircraft armament and fully determined to deny its opponents the freedom of observation."²³

The new doctrine differentiated between tactical and strategic reconnaissance but emphasized that tactical reconnaissance would be essential to the commander of the tactical air force in obtaining information on enemy air assets close to the front and on tactical supply routes, to assist in isolating the battlefield. It still envisioned a separate "Tactical Photo Reconnaissance Group," (TPRG) comprised of a single 16-plane squadron and a "Photo Technical Unit," as well as a five-squadron "Tactical Reconnaissance Group." But, as will be seen with the 363rd TRG, this proved to be an additional and unnecessary administrative level, and the photo squadron eventually replaced one of the TR squadrons in the TRG. The separate TPRG was intended to support primarily the air forces, while the TRGs had the primary function of "securing and reporting of information for the ground forces." The new doctrine also

The 27th Reconnaissance Squadron in July 1943, still equipped with P-39s.



BY LATE 1943, TACTICAL RECONNAISSANCE DOCTRINE HAD BEEN CLEARLY DEFINED AND WAS BEING DISSEMINATED THROUGHOUT THE SERVICES

emphasized mobility, stipulating that the majority of each group be air-transportable and capable of being split into “A” and “B” sections, another innovation developed by the RAF in the Western Desert. The squadrons were also to operate in pairs, with one ship “charged with obtaining and reporting ground activity as well as securing the necessary photographs. The other airplane is responsible for navigating, guarding against hostile interception, and maintaining control with the Tactical Control Wing.” During the Cold War, the USAF effectively combined the two aircraft by employing a two-person aircraft, such as the RF-4C.²⁴

Finally, this mature doctrine emphasized the importance of both photographic collection and interpretation. The TRG, equipped primarily with F-6 (P-51) type aircraft would concentrate on oblique photographs at an altitude of up to 5,000 feet using the K-24 camera. The TPRG, with its F-5 (P-38) aircraft with cameras containing 6-inch, 12-inch, 24-inch, and 40-inch focal cones, would operate above 30,000 feet. Each squadron of both units would be equipped with a highly mobile “airborne squadron laboratory,” capable of producing between 500 and 700 prints per day. (one per TRS, four per TPRS). Each TRG would have a Photo Laboratory Section, mounted in three A-2 trailers and capable of 3,000-4,000 prints per day. Each TPRG would have a Photo Technical Unit, with forty-four assigned interpreters, capable of producing and analyzing 12,000-14,000 prints per day. Units would be capable of producing prints in less than three hours from delivery of the film.²⁵

Throughout the winter of 1943-44, ground and air units trained under this new construct, espe-

cially in joint exercises in the three primary Army maneuver areas (Carolina, Tennessee and Louisiana) as well as the armored force maneuver area in California. For example, just the Tennessee maneuver area, which was closed in April of 1944, hosted three large-scale exercises which combined tactical air units with ground forces that would later reunite on the battlefields of Northwest Europe. From September 13, to November 3, the 48th Fighter-Bomber Group, 391st and 394th Medium Bomb Groups, the 436th Troop Carrier Group and the 73rd Tactical Reconnaissance Group (all types which would eventually comprise the 9th Air Force’s various subordinate commands) supported a provisional corps of ground forces including the 30th, 94th, and 98th Infantry Divisions as well as the 12th Armored Division. After a three-week recess, the next exercise ran from November 22 to January 13, and again featured Fighter-Bomber, Medium Bomber and Tactical Reconnaissance Groups supporting a corps of the 35th, 87th and 100th Infantry Divisions and the 14th Armored Division, all units who would see combat that autumn in France. A final exercise ran from January 31 to March 23 and included a like number of units.²⁶

Each exercise kicked off with an “Air Support School,” such as the one held in a high school gymnasium in Lebanon, Tennessee on July 2, 1943. The conference indicated just how quickly the concepts developed in the Western Desert and codified in FM 100-20 had diffused down to the most critical levels of air-ground cooperation. At the conference, air officers provided a series of classes highlighting both the new techniques and their proven origins.

Key Field GLO School:
British Officer Instructors
of the Ground Liaison
School. Left to Right: Maj.
James W. London, Maj.
David Powell, Lt. Col. Peter
G. Brown, Chief Instructor,
Maj. Douglas G. Board,
Maj. Clifford D. Field and
Maj. Charles E.
Underdown. July 20, 1944.



IN APRIL 1944, THE AAF FURTHER ADJUSTED TRAINING UNITS AND ASSIGNED LOCATIONS.

Airmen first emphasized the success of the Eighth Army example ("General Montgomery, who commanded the British 8th Army in North Africa, said that air and ground commanders profit greatly from each other's success") before highlighting the changes from the old "observation" construct the more senior commanders had grown up with ("General Montgomery, who commands the British Eighth Army, has stated: 'Control of the available airpower must be centralized and the command must be exercised through air channels. Nothing could be more fatal to successful results than to dissipate your air resources into small packets placed under command of an Army commander with each packet working on its own plan'") before again reinforcing the successful British example ("General Montgomery is an army commander, a ground force commander, but he understands the use of air, and his victory in North Africa is the proof."). They acknowledged the failures of observation ("The observation group originally assigned to that theater had unmodified craft. This craft was not equipped to take pictures. Under the stress of early losses, this group was broken up...") before pushing the advantages of the new model ("A well-trained, well-equipped reconnaissance group in this theater would have paid unbelievable dividends.")²⁷ Tactical Air Divisions associated with the other maneuver areas conducted similar classes and practical training, resulting in both the confirmation of the doctrine and in the majority of new units going overseas being familiar with the modified construct.²⁸

In April 1944, the AAF further adjusted training units and assigned locations. As most ground units destined for overseas service had already left the country, the Army closed the Carolina and

Tennessee maneuver areas and left open only the one in Louisiana. Accordingly, the III Reconnaissance command consolidated units at Morris Field, near Charlotte, NC; Barksdale Field, near Shreveport, Louisiana, and Thermal Field, California into Louisiana. III Reconnaissance Command became III Tactical Air Command, to mirror the combat organizations in Europe, and supported three Tactical Air Divisions, at Deridder and Esler Fields, Louisiana and Key Field, near Meridian. III TAC's commanding general, Hume Peabody, directed the new organization to:

Control all air units in air-ground maneuvers
Maintain effective liaison with ground forces
Develop technique and policy for employment of Air Force units in combined air-ground maneuvers, in accordance with FM 100-20
To prepare for immediate combat photographic and tactical reconnaissance squadrons and replacement crews
Operate a Ground Liaison School.

As the responsibility for maneuvers wound down, the III TAC concentrated on training the final Fighter Groups to depart overseas and keep up a flow of replacement pilots for the reconnaissance units. Between April and September of 1944, the unit sent 364 F-5 crews and 269 F-6 crews overseas.²⁹

One group of replacement pilots formed the cadre of the 363rd Tactical Reconnaissance Group, organized in September 1944, during the drive across France after the breakout from the Normandy beachhead. The group consisted of three Reconnaissance squadrons, the 160th, 161st and

F-6 pilots receive last minute instructions before takeoff.



AS THE RESPONSIBILITY FOR MANEUVERS WOUND DOWN, THE III TAC CONCENTRATED ON TRAINING THE FINAL FIGHTER GROUPS TO DEPART OVERSEAS

162nd, but lost the 162nd later that month when it went to support the U.S. Seventh Army near Dijon. In order to obtain the support crews for a TRG, the AAF converted a very successful Ninth Air Force P-51 unit, the 363rd Fighter Group, into a Tactical Reconnaissance Group by reassigning most of the pilots to other P-51 units in 8th Air Force and retraining some ordnance troops in camera maintenance. The majority of the maintainers, skilled in combat repair of the P-51, shifted easily into their new roles working on the F-6. After only a few weeks, the unit flew its first mission as part of XXIX Tactical Air Command (TAC) supporting Ninth Army units in Brittany as they worked to reduce the garrisons of Brest and other Atlantic ports.³⁰

As the campaign in Brittany wound down, Ninth Army and XXIX TAC redeployed to the east and General Omar Bradley, commanding the U.S. Twelfth Army Group, inserted them into the line against stiffening resistance coming from German forces now reconstituting behind the *West Wall*. The Ninth was originally destined for a quiet sector between the American First and Third armies, opposite the Ardennes but, in a fortuitous move for the Ninth, eventually moved north to occupy the space between First Army and General Montgomery's Twenty-first Army Group. According to the Army's official history, Bradley's motives were far from altruistic. Knowing that his Army Group would soon be joined by the U.S. Seventh Army, coming up from the south of France, Bradley feared that he would be asked to give up one of his U.S. armies to Montgomery and did not want it to be his best and most experienced unit, the First Army. By inserting the Ninth Army on its left flank, the less experienced and less capable unit would go to the

British instead. In the end, Montgomery won out, as both Ninth and the majority of First Army came under his control on the northern shoulder after the Bulge battle that drove a wedge into Bradley's First Army positions in Belgium and Luxembourg.

For XXIX TAC and the 363rd Reconnaissance Group, the shift north meant an additional delay in getting settled and established, but the emphasis on mobility in the new TRGs paid dividends as the group executed two complete station changes during October before settling in at airfield Y-10 (Le Culot/East now Goetsenhoven) roughly half-way between Brussels and Maastricht, which would be the group's home until mid-March, 1945. From there the unit flew extensive reconnaissance in support of what would become Operation QUEEN, the principal Allied offensive effort in November, 1944, which was designed initially to reach the banks of the Rhine but succeeded only in clearing the western bank of the Roer River before being halted by the German counteroffensive further south. During the month, the group scheduled 307 missions but flew less than half due to weather. The arrival of the 33rd Photo Reconnaissance Squadron on November 5, a belated replacement for the 162nd TRS, which had left in late September, bolstered the group's numbers and capabilities, but the weather remained so bad that the new squadron did not fly a successful photo mission until November 18. In addition to supporting the First and Ninth Army offensives, the group also reconnoitered the road and rail network behind the front for Ninth Air Force's medium bombers. Increased interceptions, to the point that that group's F-6s had to escort F-5s on their missions, could have been an indicator of increased German

Ninth Army commander Lt. Gen. William H. Simpson and XXIX TAC commander Brig. Gen. Richard E. Nugent, 1944.



WHILE THE AAF WAS EXPERIMENTING WITH P-61s IN A NIGHT RECONNAISSANCE ROLE, THE INABILITY TO FURTHER DEVELOP AND EXPAND THIS CAPABILITY MARKS ONE OF THE MORE PROMINENT BLIND SPOTS

sensitivity to reconnaissance in that sector. As early as November 3, the group had reported “considerable traffic...in the Julich Koln area. The traffic was largely to the North and South, with the majority of trains moving toward the South,” including twenty-one total trains, some loaded with armor.³¹ Later in the month, the group again reported “A comparatively large number of vehicles, some of which were armored vehicles and tanks,” and the following day, “vehicular traffic appeared to be somewhat heavier than usual. Small convoys varying in size from six to twenty trucks were observed scattered throughout the target area. Movement appeared to be mostly to the east and west. Small groups of horsedrawn vehicles were reported. Movement of these appeared to be mostly toward the southeast and east.”³² If the group had detected the early stages of the German redeployment for the Bulge battle, it was insufficient to alert most of the intelligence apparatus, which could not believe that the Germans could recuperate so quickly after the huge materiel losses in the fall. In any event, the Germans moved most of their resources at night, which would have escaped the gaze of any of the TRGs, which were constituted exclusively for daylight operations. While the AAF was experimenting with P-61s in a night reconnaissance role, the inability to further develop and expand this capability marks one of the more prominent blind spots in the rehabilitation of the observation branch.

The 363rd went on the support Ninth Army until shifted south during the height of the Bulge battle. Upon its return, it undertook a massive photographing of the entire Ruhr industrial area on February 22, 1945, in which thirteen P-38s pho-

tographed 1,200 square miles in less than fifteen minutes, and had 22,000 prints available nine hours later, a mission that earned the group commander Lt Col James Smelley (later Shelley) the Silver Star. Ninth Army remained generally pleased with the group’s responsiveness and work noting that it “supplied some of the best reconnaissance of any group in the ETO.”³³ The Ninth Army commander, Lt Gen William H. Simpson observed, “I am pleased with the spirit of close cooperation which has always existed between the XXIX TAC and the Ninth US Army...It is my opinion that the time consumed in processing and delivering information and photographs to ground echelons has been reduced to a minimum by the application of sound operational practices.”³⁴ The achievement is all the more remarkable given how badly observation had performed in North Africa and how quickly, given the proven British model to work from, it had been corrected and disseminated throughout the US air-ground team in just a little over a year. To go from a completely broken capability to an effective reconnaissance organization that performed well in the crucible of combat is a testament not only to the soundness of the doctrine, but the skill in developing a training curriculum and the effort expended in stateside training exercises.

In 1956, Futrell concluded that “real progress did not come until 1943 when AAF planners, *freed at last from the necessity of using their capability primarily to support the ground forces*, swept away the old organization and erected a new and integrated system of reconnaissance which fully identified the mission and aimed at the maximum utilization of air capabilities for the best advantage of both air and ground in a complete war effort.”

Writing at the height of the Cold War, especially in the aftermath of Korea where there were frequent accusations of a breakdown in the air-ground team, Futrell can be forgiven for trying to paint the period in the most favorable possible light, especially in a study commissioned by an Air Force intent on parrying all threats to its independence and conscious of Army initiatives to reintroduce indigenous aviation assets back into the ground forces, an effort ultimately successful in the form of rotary-wing aircraft. It might have been more accurate to write that, from 1943-45, the air and ground forces had sufficient assets available to adequately meet the requirements of both the ground and air forces and demonstrate what could be accomplished with a spirit of cooperation and respect, but never developed a fully integrated reconnaissance infrastructure. Current struggles

in the US ISR community suggest that this issue still hasn't been fully resolved. As an example, during the author's service as a navigator aboard the E-8C Joint STARS reconnaissance aircraft, there were frequent debates about the aircraft's proper role. Ground commanders saw it as a true ISR platform, collecting data on enemy ground forces and funneling this information to the ground headquarters, who would then track and target with appropriate ground-based systems. Air officers, on the other hand, tended to view the platform as more of a command and control asset, managing battlefield assets for immediate detection, identification and attack of time-sensitive ground targets. This difference of interpretation has a deep foundation in service struggles over reconnaissance assets, roles and missions dating back to the Second World War. ■

NOTES

1. William Mitchell, *Our Air Force: The Keystone of National Defense*, (New York: Dutton, 1921), pp. 35, 37.
2. Spaatz to Arnold, Feb. 25, 1943, Box 357, Entry 294, RG 18, Records of the Army Air Force, NARA 2, College Park, Md.
3. Robert F. Futrell, "Command of Observation Aviation: A Study in the Control of Tactical Airpower," (Maxwell AFB, Ala.: Air University Research Studies Institute, 1956).
4. Doug Gordon, *Tactical Reconnaissance in the Cold War: 1945 to Korea, Cuba, Vietnam and the Iron Curtain*, (Barnsley, UK: Pen and Sword, 2006)
5. Futrell, p. 16.
6. Futrell, p. 17. As of July 1, 1942, each observation squadron was to have six "high performance single-engine types" (P-39), six "high performance twin-engine bomber types" (A-20) and nine "liaison" types (L-3 or L-4). The AAF Ground-Air Support Directorate rightly complained that the observation branch was receiving the "crumbs from the table" or models excess to other branches," Futrell, p. 18.
7. GP-RCN-68-HI, AFHRA, Maxwell AFB, Ala.
8. 154th Weather Squadron History, AFHRA SQ-WEA-154-HI. The 154 became a weather reconnaissance squadron in 15th Air Force after its service in North Africa.
9. GP-RCN-68-HI, AFHRA, Maxwell AFB, Ala.
10. Francis Kalinowski, "The History of the 154th (Observation, Tactical, Reconnaissance) Weather Reconnaissance Squadron (Medium), 1940 - 1945," http://www.15thaf.org/154th_Weather_Sqdn/PDFs/The%20History%20of%20the%20154th.pdf, accessed March 2, 2015.
11. Spaatz to Arnold, Feb. 25, 1943, Box 357, Entry 294, RG 18, Records of the Army Air Force, NARA 2, College Park, Md.
12. Brad Gladman, *Intelligence and Anglo-American Air Support in World War Two: The Western Desert and Tunisia, 1940-43*. (New York: Palgrave Macmillan, 2009) p. 162. Gladman points out that the RAF's 225 Squadron conducted tactical reconnaissance for II Corps, due to both their greater experience and their possession of a liaison section capable of discerning and prioritizing the ground forces' desires.
13. Gladman, p. 169.
14. Futrell, p. 29.
15. Kuter to Spaatz, May 12, 1943, Box 12, Spaatz Papers, Library of Congress, Washington, D.C. Quoted in Gladman, p. 187.
16. Here it can be assumed that "military" is roughly equivalent to "Army," just as the Army's officer training school at West Point is known as the "U.S. Military Academy."
17. Field Manual 100-20, *Command and Employment of Air Power*, (Washington, D.C.: GPO, 1943), p. 3.
18. Field Manual 1-20, *Tactics and Technique of Air Reconnaissance and Observation*, (Washington, D.C.: Government Printing Office, 1942), p. iii.
19. Futrell, p. 25.
20. Futrell, p. 27.
21. Folder January -December 1943, SQ-RCN-21-HI, AFHRA, Maxwell AFB, Ala.
22. Arnold to McDaniel, October 12, 1943, Reference #26, 448.01, AFHRA, Maxwell AFB, Ala.
23. "AAFSAT ANSCOL Course, Class 1943C," v. 5, p. 974, AFHRA 248.411, Maxwell AFB, Ala.
24. AAFSAT ANSCOL Course, Class 1943C," v. 5, pp. 981, 989.
25. AAFSAT ANSCOL Course, Class 1943C," v. 5, pp. 1005-1013.
26. History of the 1st Tactical Air Division, AFHRA 446.01.
27. "Conference on Air Support to Assembled Officers of the Second Army at Air Support School," Lebanon, Tennessee, July 2, 1943. AFHRA 444.01, Maxwell AFB, Ala.
28. The 1st TAD official history believed "The soundness of prescribed doctrines was proved after test in maneuver operations." 1st TAD History, p. 23 AFHRA 446.01.
29. Folder "April-September 1944", AFHRA 448.01, Maxwell AFB, Ala.
30. GP-RCN-363-SU-RE-D, September, 1944, AFHRA, Maxwell AFB, Ala.
31. Summary of Operations, November 3, 1944. GP-RCN-363-SU-RE-D, AFHRA
32. Summary of Operations, November 18 & 19, 1944. GP-RCN-363-SU-RE-D, AFHRA
33. GP-RCN-363-HI, AFHRA
34. Futrell, pp. 28-29.

X-15: The World's Fastest Rocket Plane and the Pilots Who Ushered in the Space Age. By John Anderson and Richard Passman. Minneapolis, Minn.: Zenith Press, 2014. Photographs. Pp. 144. \$30.00 ISBN: 978-0-7603-4445-3

A family with a ten-year-old son moved to suburban Washington D.C. in August 1969. In California, the son and his best friend argued about how the X-15 should be drawn. On their first visit to the National Air and Space Museum (NASM), the boy was unimpressed with the Wright's airplane or the *Spirit of St Louis*, for around a corner sat the X-15. The ten-year-old's life was suddenly complete! I was that ten year old. Little did I know that just eleven years later I'd begin talking about the airplane "professionally" as a docent. I wish I had a book like this those many years ago!

This is a perfect introduction for someone new to the X-15. The first quarter of the book begins in 1944, when the National Advisory Committee for Aeronautics (NACA), U.S. Army, and U.S. Navy participated in a study that led several years later to the Bell X-1, the first airplane to exceed the speed of sound (Mach 1) in level flight. With the success of the X-1, two more aircraft followed: the X-1A (Mach 2.5+) and the X-2 (Mach 3.2+).

After the success of these two aircraft, the NACA wanted to study hypersonic speeds (Mach 5+). In 1954, the NACA sent a request for proposal to a dozen aircraft manufacturers for an aircraft to study hypersonic flight and achieve a fifty-mile altitude. Four companies responded; North American Aviation won the contract in 1956.

The remainder of the book follows a standard format (other X-15 histories do the same). First described is the X-15's structure, systems, and engine. Next chronicled is the X-15's home, Edwards AFB, California; the emergency landing spots along the flight path from Death Valley to Edwards; the B-52 mother-ship; and the chase planes. Readers are then introduced to the personnel at NASA's Flight Research Center and the twelve men (one would walk on the Moon) who flew the X-15. Following that are descriptions of the two X-15 flight profiles, speed, and altitude, with a discussion on the test results of each profile. The final chapter describes the X-15's legacy and how the research helped in the design of future vehicles, including the Space Shuttle.

Anderson and Passman have extensive experience in aerospace engineering and have created a book that renders complex structure and aerodynamics into very easily understood descriptions. But Chris

Fayers of Zenith Press also needs recognition for designing a visually striking book. Even before opening the book, the dust jacket gives an idea of this with its bold text, sharp imagery, and very "reptilian" front view of the aircraft. Chapter pages are black with white text, with the chapter titles and numbers in a bold red box. Following this same format are numerous sidebars that enhance each chapter. Included are a few diagrams showing forces on the X-15 airfoils. With the book printed on slick paper, the 150 photos (only a few in black and white) are vibrant and clear. Anderson's and Passman's text round out the book.

The photo selection is my only real criticism. The book has twenty photos of the B-52/X-15 mate-up, some of them almost a duplicate of others. With so many photos available, a wiser choice would have been to limit mate-up photos to leave space for additional subjects.

The X-15 is my favorite exhibit at NASM. I've read many books and watched many documentaries on the aircraft through the years. But this book, with its stunning imagery and easily read text, is the perfect place to begin learning about, what is considered today, the most successful X-plane of them all.

Scott Marquiss, docent, NASM's Mall and Udvar-Hazy facilities



Churchill's War Against the Zeppelin 1914-18 Men, Machines and Tactics. By Leon Bennett. Solihull, U.K.: Helion & Company Publishing, 2015. Photographs. Illustrations. Bibliography. Notes. Index. Pp.424. \$59.95 ISBN: 1-909982-84-9

If I were asked to select the best book of the year on World War I aviation history, there is little doubt that Leon Bennett's newest work, *Churchill's War Against the Zeppelin 1914-18 Men, Machines and Tactics*, would be my choice. This book delves into the workings of the British and German struggle that was played out in the skies over England in the early years of the war. It is a complex story that is well-told and examined in great depth.

Bennett covers the technological underpinnings of the German ascendancy in rigid airships and the British response for homeland security, as the UK was "No longer an Island." The geo-political struggle, both in England and Germany, is covered not only with an excellent analysis but also with the brilliant use of contemporary political cartoons, which are a stroke of genius for the reader's benefit.

Bennett is obviously well versed in

the principles of flight and has made use of drawings to illustrate both basic and more complex technical issues involving both airships and aircraft. His conclusions regarding, and interpretations of, Winston Churchill are insightful. They neither condemn nor unfairly judge the man. Rather, they place him precisely at the center of the whirlwind that Britain found itself in during the early years of the war.

The chapters of the book follow the initial developments of powered airship flight, a concurrent technological event throughout Europe. Then it deals with Churchill's political rise and fall as First Lord of the Admiralty (1911-1915). During his time as First Lord, he oversaw the modernization of the Royal Navy and, more importantly, recognized and embraced the military importance of the airplane. With nearly 200 illustrations—which include technological explanations, political cartoons, contemporary images and photographs—the book has a laudable visual representation to accompany the text. The notes section, with nearly 900 entries, is an excellent resource for anyone seeking further information on any topic covered in this book. There is a useful bibliography that complements the work along with an index divided into three sections covering the topics of people, geographic locations, and military organization and equipment.

In all, from cover to cover, this is a very complete and excellent work.

Carl J. Bobrow, Museum Specialist, National Air and Space Museum



The RNAS and the Birth of the Aircraft Carrier 1914-1918. By Ian M Burns. Oxford U.K.: Fonthill Media, 2015. Photographs. Appendices. Bibliography. Notes. Index. Pp.224. \$28.00 ISBN: 1-78155-365-3 (also available in epub and Kindle formats)

All but forgotten are the names of those individuals who engaged in the first tentative steps of projecting naval air power as exemplified by the aircraft carrier. The initial exploratory effort in what would be a long process took place in 1912, when Commander Charles R. Samson sat at the controls of a Short Brothers-manufactured aircraft and took off from the foredeck of the battleship *HMS Hibernia*. It would not be until 1917, that landing on a moving ship would take place. In that year, Squadron Commander Edwin H. Dunning, Royal Navy, landed a Sopwith Pup on *HMS Furious*.

The successes and failures of these

early experiments and their importance in the course of aviation and naval history are the subjects of this book. Much of this significant work is presented in the words of those who participated, not just the official records. Ian Burns synthesizes and distills the relevant facts into brief segments enabling the reader to absorb a great deal of detail quickly and with a good grasp of the events. The book's seventeen chapters cover a whole panoply of topics. Included are those important and curious milestones that occurred during World War I such as seaplane-versus-landplane design; the battle of Jutland; the decision to create a full-deck aircraft carrier; and, of course, the surprise raid on the Tondern Zeppelin sheds. Of particular interest to me was the experimental "lighters"—small deck boats towed at high speed by a destroyer—that provided a short-run takeoff deck for a single aircraft. The greatest example of use of these occurred on August 11, 1918, when *Lieutenant Stuart Douglas Culley, an American by birth*, took off in a Sopwith Camel from such a lighter and intercepted and shot down the German Zeppelin L53, the last great airship to be brought down in the war.

Burns has provided the reader with useful appendices that contain performance comparisons of Royal Naval Air Service (RNAS) aircraft and *HMS Furious* operations in 1917-1918. There are fifty-one photographs, all of high-quality since they are reproduced on glossy paper.

In all regards, this work provides in a single work a good view of RNAS activities on the subject; it is recommended reading for anyone interested in the origins of today's aircraft carrier weapon systems.

*Carl J. Bobrow, Museum Specialist,
National Air and Space Museum*



Wings of War: Great Combat Tales of Allied and Axis Pilots During World War II. By James P. Busha. Minneapolis, Minn.: Quarto Publishing Group, 2015. Illustrations. Photographs. Index. Pp. 256. \$30.00 ISBN: 978-0-7603-4852-9

This book had its genesis in the 1990s, when James Busha began interviewing a few World War II airmen simply because he wanted to learn what it was like to fly in combat in aircraft similar to the Aeronca L-3 he flew as a private pilot. Over the next two decades Busha's desire to satisfy his personal curiosity grew into a major effort to capture first-hand accounts from as many combat veterans as possible. From the countless narratives Busha col-

lected, he chose several dozen for *Wings of War*. Here are two of the many that stand out:

Geoff Fiskien of the Royal New Zealand Air Force flew a Brewster Buffalo in 1941-1942, before moving on to P-40s. After taking delivery of 170 Buffalos, the Royal Air Force deemed the type to be unsuitable for combat against the Luftwaffe and shipped all the aircraft to the Pacific to be flown by the air forces of Australia and New Zealand. Considered by many to be one of the worst fighters of the war, the Buffalo was clearly inferior to the Zero and other Japanese fighters it faced, but it did have its moments. Fiskien was the highest scoring Buffalo ace in Southeast Asia, with six kills to his credit in less than two months in combat. Fiskien understandably enjoyed flying the Buffalo, but he was one of the few pilots who did.

Most stories about *Glacier Girl* deal with the end of the story: how the Lockheed P-38 Lightning was recovered and restored to flying status decades after it crashed in Greenland in 1942. U.S. pilot Brad McManus was there at the beginning. McManus's P-38 was one of eight that accompanied two B-17s as the ten aircraft headed to England as part of the massive build-up of Allied forces. The flight from Maine to England by way of Canada, Greenland, and Iceland would have been difficult under the best of circumstances, but McManus and his fellow airmen had to deal with horrendous weather conditions that stressed even the long range of the P-38. The final leg of the flight, which lasted more than eight hours, ended when all aircraft crash-landed in Greenland, far short of their intended destination. After emergency supplies were air-dropped, the crews were able to trek to safety, but the aircraft were abandoned. One of those P-38s—later named *Glacier Girl*—became trapped in the ice, where it remained until 1992.

Other stories tell of Willi Kreissman, an He 111 pilot during Germany's disastrous retreat from the Soviet Union; Zeke Swett, who earned the Medal of Honor by downing seven enemy aircraft during one engagement in the Solomon Islands in 1943; and Al Wood, one of the few U.S. Navy pilots to fly ground support missions in Europe during the war.

There are many books and articles that capture first-person accounts of aerial combat, but *Wings of War* stands out as one of the best. Almost without exception the stories are interesting and informative. Busha has done a good job of selecting accounts that cover a wide range of aircraft, missions, and personalities, and his brief narratives are effective in framing the stories in context with the overall

progress of the war. He is to be commended for reaching out to combat veterans and capturing their stories.

*Lt. Col. Joseph Romito, USA (Ret.), Docent,
National Air and Space Museum's Udvar-Hazy Center and National Mall Facility*



Expanding the Secretary's Role in Foreign Affairs: Robert McNamara and Clark Clifford, 1963-1968. By Joel C. Christenson. Historical Office, Office of the Secretary of Defense, 2014. Notes. Pp. xii, 38. Free download from http://history.defense.gov/Portals/70/Documents/special_studies/SpecStudy5.pdf.

The National Security Act of 1947 created the National Military Establishment (NME), a significant member of which was the Secretary of Defense (SecDef). Subsequent amendments to the Act in 1949 and 1958, sought to enhance the role of the Office of the SecDef (OSD) as a manager of the NME and create an NME more responsive to national foreign policy. From the Truman Presidency through the Eisenhower years, the role of the Secretary continued to evolve and become more involved in the development of foreign policy.

This study, the fifth in the Cold War Foreign Policy Series published by the OSD Historical Office, emphasizes the evolution of the SecDef's role in the United States' foreign policymaking process as a part of the development of OSD since 1947. The study focuses on the tenures of Robert McNamara and Clark Clifford, 1963-1968. In this short monograph (38 pages of text and six pages of notes), Joel Christenson traces the evolution of the SecDef's rise to become a key advisor to the President on foreign policy in the White House under Lyndon Johnson.

Although the study is intended to look at the expanding role of the OSD under McNamara and Clifford, the majority of the monograph is devoted to McNamara. It was during his term that most of the gains were realized. Christenson reiterates the crucial role played by members of McNamara's staff, particularly John McNaughton as the Assistant Secretary of Defense for International Security Affairs, in the rise of the Secretary's role in international affairs and McNamara's subsequent disillusionment with Johnson's Viet Nam policy and dismissal by Johnson.

Christenson emphasizes the impact of McNamara's management initiatives in the Pentagon and how they allowed him to quickly and fully respond to Johnson's requests for information. As a result,

Johnson saw the Secretary as a “source of great strength.” Christenson also clearly articulates the basis for Johnson’s dependence on McNamara; that is, the series of military crises during Johnson’s term from the intervention in the Dominican Republic to Viet Nam. Johnson was far more comfortable with domestic issues than he was with foreign and defense affairs and, like Kennedy before him, had a general distrust of the military—especially the Joint Chiefs of Staff.

The book then discusses the appointment of Clark Clifford, an old friend and Democratic functionary, as McNamara’s replacement. Later, Johnson realized that Clifford, viewed initially as a hawk on Viet Nam, was not as strong a supporter of the administration’s policy as initially perceived.

The monograph accomplishes Christenson’s stated purpose: illustrate the SecDef’s role in the development of U.S. foreign policy during the administration of President Lyndon Johnson. Overall, this is an easy, quick read; although much of the information is already discussed in books by David Halberstam and Robert Caro.

MSgt. Al Mongeon, USAF (Ret.)



Air Power in UN Operations: Wings for Peace. By A. Walter Dorn, Ed. Burlington, Vt.: Ashgate Publishing, 2014. Illustrations. Tables. Photographs. Notes. Index. Pp. xxxvi, 350. \$49.95 paperback ISBN: 1-4724-3549-1

A United Nations (UN) Air Force? The UN, of course, has no air force to call its own. With that as a starting point, this book makes interesting reading. In a collection of case studies written for the most part by participants in UN operations. The different authors explore the use of air power in peacekeeping/peacemaking and humanitarian efforts over six decades of operations.

Seventeen essays present the different roles aircraft have played during UN mandated operations: airlift, aerial reconnaissance, air defense, close air support, aeromedical evacuation, and unmanned aerial vehicles.

Early on, the UN discovered that it could be much more effective if it employed supporting aviation assets. Thus the use of aircraft began in the late 1940s with a minuscule presence of cargo and liaison aircraft supporting peacekeeping in Kashmir. From that small beginning the role of air power took on greater and greater importance. It may come as a surprise to some readers that the UN first

employed fighter aircraft in the early 1960s during combat in the Congo’s break-away province of Katanga. The UN continues to use combat aircraft during its current peacekeeping operations in eastern Congo.

Where have the aircraft come from? The UN is totally dependent upon assets provided by member nations and upon contracted airlift. In the earlier Congo operation, most aircraft, aside from those provided by the Canadians, came from neutral countries such as India, Sweden, and Ethiopia. In addition, the United States provided inter-theater airlift when the capability was otherwise unavailable. Several of the essays make it clear that the politics of the Cold War exacerbated already difficult operational limitations. The Soviets would often protest the inclusion of aircraft from NATO members. This impacted major contributing countries such as Canada. It also made the UN reluctant to request support from the United States. However, in later air operations following the Cold War such as Bosnia (1995), Kosovo (1999), and Libya (2011), NATO has been the central participant. This is all discussed in the later chapters.

This book is especially rich in the discussion of operations where Canada has been an important player. This is so for several reasons. Canada has always “stepped up to the plate” when the UN needed peacekeepers. Beyond that, most of the authors are Canadians who are speaking from a wealth of hands-on knowledge of air power employment during UN operations.

This study seeks to overcome the large gap in the studies of air power in UN operations and to address the challenges faced by this world organization. As an overview, it has achieved those goals. The authors have addressed important lessons learned and shortcomings in the UN’s use of air power and have made recommendations for future operations.

I found this anthology to be a good resource for understanding the way air power has folded into UN operations and how the process is being improved. Having worked alongside UN forces in the Balkans, Africa, and the Middle East, I find the discussions spot-on and illuminating.

I was surprised by one odd error in the foreword written by the former UN force commander in Rwanda. In speaking about the infamous Radio Television Libre des Mille Collines, he cited the station as a major voice in the genocide committed by Tutsis against the Hutus. The station was actually identified by the UN war crimes tribunal as being responsible for inciting

the *Hutu* to commit genocide against the *Tutsi*. Otherwise, this collection is informative and interesting.

Col. John Cirafici, USAF (Ret.), Milford Delaware



365 Aircraft You Must Fly. By Robert F. Dorr. Minneapolis, Minn.: Zenith Press, 2015. Photographs. Index. Pp. 320. \$22.99 ISBN 978-0-7603-4763-8.

Robert Dorr is well known to readers of this periodical as our former technical editor, and a very prolific and highly respected aviation author. *365 Aircraft You Must Fly* is somewhat different from his previous works—in a class of its own. It is a mid-sized paperback book printed on slick paper featuring 365 aircraft (I’ll trust his count) one or two to a page. Each entry contains a clear photo and basic information that includes date of first flight, engine and power, maximum speed, wingspan, and the number built. A short paragraph includes a pithy short-phrase summary and a few interesting facts about each machine.

The aircraft included extend over the history of aviation, from the Wright flyer to the B-1, civilian and military, a worldwide assortment, although the primary focus is on U.S. aviation. Thus while U.S. aircraft are well covered (some 210 in just over 300 pages of text), the same is not true for aircraft of other nations. The aircraft are arranged by country of origin and then by date of first flight. There is a single index arranged by manufacturer.

Dorr does not directly indicate how he picked these particular aircraft. However, what appears on the cover and on the title page as perhaps a curious and long subtitle appears to be the focus: “The most sublime, weird, and outrageous aircraft from the past 100+ years . . . HOW MANY DO YOU WANT TO FLY?” Most of the entries are to be expected, such as those aircraft built in large numbers, those famous for their flying record, or curiosity. Nevertheless, with 365 entries, readers will probably balk at, and certainly question, some of Dorr’s inclusions and exclusions. For example the British Valiant, Victor, and Lightning are absent, along with the German Ju 52 Iron Anne and the American T-33 T-Bird, F/A-18 Hornet, the B-29 Superfortress (the restored warbird *Fifi* is included), along with the B-2 Spirit. While the Wright Flyer appears, the *Spirit of St. Louis* does not. A number of aircraft that I expect are unknown to most *Air Power History* readers are covered such as the Mercury Air Shoestring, DeLackner

HZ-1 Aerocycle, Piasecki VZ-8 Sky Car, and the Garrett Stamp. However, more serious criticism is that additional indices, by function or designation, would have been helpful. Others may criticize this book for its lack of detail, neglect of aircraft variants, and so forth, but such changes would yield a much larger, costly, and different book. As is, Dorr's book is a handy, useful, brief, punchy, convenient, short overview of notable (albeit mainly American) aircraft.

Kenneth P. Werrell, Christiansburg, Va.

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Unmanned Systems of World War I and II. By H.R. Everett. Cambridge, Mass.: The MIT Press, 2015. Photographs. Illustrations. Bibliography. Notes. Index. Pp. 757. \$75.00 ISBN: 978-0-262-02922-3

The book is a very comprehensive exploration of unmanned (drone) vehicles envisioned, designed, and, in some cases, used in naval, air, and ground warfare. It is not light reading for the armchair historian. Rather, it is a serious review of a large number of remotely controlled vehicles whose development began in the late 1800s.

Everett, a retired U.S. Navy commander, is Technical Director for Robotics at the Space and Naval Warfare Systems Center in San Diego, California. The bibliography is extensive as are the end notes. He explains how the unmanned systems were designed to operate in the context of warfare at the time of their development. The systems explored run the gamut from tethered torpedoes to guided aerial missiles to unmanned land vehicles.

Chapter 4, Unmanned Air Vehicles, will probably be of most interest to readers of *Air Power History* magazine. It starts with free-flight balloons first introduced in combat at the Austrian siege of Vienna in 1849 during the Italian War of Independence, and touches on the Japanese hydrogen-filled fire balloons riding the jet stream, designed to set forest fires in the western United States in retaliation for the 1942 Doolittle-led raid on Tokyo. Guided missiles include the early Navy Curtiss-Sperry Flying Bomb of 1915 and the Army Kettering Bug of 1918, neither of which saw service during the First World War. However, both presaged the Navy ship and submarine-launched Regulus I and the Air Force land-launched Matador, Mace, and Snark cruise missiles of the 1950s. Everett devotes several paragraphs to the German V-1 cruise missile, the first operational cruise missile, and a number of pages to the German V-2, the first mod-

ern tactical ballistic missile from which all intermediate and intercontinental ballistic missiles evolved.

Much of the description is highly technical, delving into the command and control mechanisms that existed at the time. A number of illustrations and sketches are used to demonstrate how the control systems functioned.

Capt. John F. O'Connell, USN (Ret.),
docent, National Air and Space Museum

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P-51 Mustang, Seventy-Five Years of America's Most Famous Warbird. By Cory Graff. Minneapolis, Minn.: Zenith Press, 2015. Diagrams. Illustrations. Photographs. Index. Pp. 224. \$40.00 ISBN: 978-0-7603-4859-8

This is fundamentally a beautiful picture book with generous captions on the illustrations and a moderate amount of text. The pictures are well-chosen, interesting, and beautifully reproduced on heavy paper. Some are so gorgeous that, if they weren't printed on two pages, one would be tempted to tear them out and frame them. The photos are not hurt by the fact that the North American Aviation (NAA) Mustang, especially its NA-73X prototype, was one of the most elegant looking aircraft ever built.

Graff is the military aviation curator at the Flying Heritage Collection in Everett, Washington. He graduated from the University of Oregon and worked for the Museum of Flight in Seattle prior to moving to the Flying Heritage Collection in 2008. He has written at least eight previous aviation/military-related books.

The book covers the entire history of the Mustang. Graff did not end the story with World War II but also includes the war in Korea as well as the plane's career as a racer, warbird, and museum artifact. He did an outstanding job of finding excellent photos of the aircraft both in production and in service. Many contemporary posters and advertisements are also included, adding a feel for the way America thought about World War II and about the Mustang. Some are quite elegant. Inclusion of shoulder patches of the various numbered air forces that used the Mustang is also a very nice touch.

However, there are some issues with the text. On page 20, while apparently discussing the NA-73 (Mustang MK I, XP-51), which had an Allison V-1710 engine, Graff describes the under-fuselage duct as containing "the airplane's water-cooling radiator, oil cooler, and aftercooler." Allison engine Mustangs did not have

after-coolers. The after-cooler appeared with the Packard V-1650 Merlin engine on the P-51B. On page 18 and 19, he suggests that NAA *sought* information from Curtiss to reduce their risk. All other sources say that the British Purchasing Commission *directed* NAA to get information from Curtiss, which they did, and that the NAA engineers never used it and, in most cases, never even saw it. The concept of putting the radiator of a liquid-cooled engine in a duct aft of the pilot was neither new nor a Curtiss idea—note the Hawker Hurricane and Lockheed P-38. He says the Mustang was "much bigger than the diminutive Spitfire." The Mustang had two inches greater span, was two feet four and a half inches longer, and had nine square feet *less* wing area. The aircraft were essentially the same size.

Graff also repeats the traditional story that the A-36 was created because of a shortage of funds to contract for P-51s. It is time to lay this legend to rest. A contract for 1,200 P-51As was signed on June 23, 1942. Government people don't sign contracts if there is no funding available. The money *was* available and was used to contract for 1,200 P-51As. The A-36 was most likely developed in response to a February 4, 1942, report recommending cancellation of a Vultee dive bomber and procurement of a more suitable dive bomber and/or attack aircraft.

There are several other irritating errors. One caption suggests that WASPs were Army pilots. They were not even considered military pilots at the time. In another, the description of the assembly process is not consistent with the accompanying photo. On page 107, when sixty bombers were lost, 560 *aircrew*, not 560 *pilots*, were lost. In addition, there are a number of typos. Despite these, however, I recommend this gorgeous book to anyone interested in the Mustang.

Leslie C. Taylor, docent, National Air & Space Museum Udvar-Hazy Center

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Luftwaffe X-Planes: German Experimental Aircraft of World War II. By Manfred Griehl. Yorkshire, U.K.: Frontline Books, 2015. Tables. Photographs. Appendices. Pp. 80. \$24.95 ISBN: 978-1-84832-789-4

Although the Treaty of Versailles, which ended World War I, called for the dissolution of the German air force and military aviation industry, it didn't take long for Germany to resume the design, development, and testing of military aircraft. The nation found ways to violate the

intent of the treaty while seemingly complying with its provisions. For example, several aircraft that were ostensibly to be used as transports by German civilian airlines were, in fact, the prototypes for medium and heavy bombers. Germany also bypassed the treaty by conducting developmental work outside its borders, to include locations in the Soviet Union, Sweden, and Switzerland.

In addition to exploiting treaty loopholes, Germany also conducted an extensive aircraft development program on its own soil in a secret program that was in direct violation of the treaty. The veil of secrecy was lifted in 1935, when Germany repudiated the treaty and established the Luftwaffe. *Luftwaffe X-Planes* is a history of Germany's military aircraft development and testing program from the early 1920s to the end of World War II.

Griehl uses a two-part approach. In the first part he describes the ten evaluation sites where most aircraft testing was conducted. Griehl discusses many of the aircraft types that were tested at each site and describes how the sites expanded over the years. The second section is a collection of more than 100 photographs, most of which show aircraft in the testing process. Each photo caption describes some aspect of the airplane and its development.

Unfortunately, the two-part approach is a major shortcoming and makes the book ineffective. In the first section the reader might find a few facts about a given airplane that was tested at a specific evaluation site. But to find all the information on that aircraft, the reader also has to scan the narrative on the other nine sites to see if the aircraft was also tested at any of those locations, and then has to search through 100-plus photographs to see if there are photos of that aircraft and determine whether the captions provide additional information. Even after doing this, the reader can't be certain he has read the complete story about the airplane. A much better approach would have been to begin with the interesting story of how Germany dealt with treaty limitations, then tell the complete story of each aircraft (with all the facts and photos in one place), and then identify the major testing sites to describe the role of each.

Other shortcomings in the book are related to language. One lengthy table carries a German title with no translation, so the reader is left to his own devices to figure out what the table means. In other cases, Griehl goes overboard in his use of German words for key terms. The editor or translator certainly knew the book was being published for an English-speaking audience and, therefore should have put the entire text in English. If the German

names are interesting or noteworthy, a short glossary could have been included to give the German equivalents of key terms.

The bottom line is that this book is disappointing. The subject is interesting and appears to have been well-researched, but the structure makes it almost impossible to come away with a clear understanding of how specific German aircraft were developed and tested.

Lt. Col. Joseph Romito, USA (Ret.), docent, National Air and Space Museum's Udvar-Hazy Center and National Mall Facility



United States Naval Aviation 1910-2010, 5th ed., Vols 1 (Chronology) and 2 (Statistics). By Mark L. Evans and Roy A. Grossnick. Washington D.C.: Naval History and Heritage Command, 2015. Illustrations. Photographs. Tables. Appendices. Glossary. Index. Pp. 747 and 469, respectively. ISBN:978-0-945274-75-9 and -96-5, respectively. Available as a free download at www.history.navy.mil/research/publications/recent-publications.html

Nearly twenty years ago, I wrote an *Air Power History* review on the fourth edition of this work in which I said, "If you have room in your library for only one book on U.S. naval aviation, this is the one to buy." Amend that to read, "These two volumes can replace everything else you have in your library regarding U.S. naval aviation." Evans and Grossnick have assembled a vast amount of information covering all facets of naval aviation in these two volumes. In addition to covering fifteen additional years of naval aviation history, the two volumes now number 1,216 pages versus the 811 pages of the last edition.

I'm not sure why the title says 1910-2010, when, in fact, the book actually covers the topic from 1898, when the Navy assigned two officers to sit on an interservice board to study possible military uses of Dr. Samuel Langley's flying machine. The first of Vol 1's thirteen chronological chapters is, indeed, *A Few Pioneers: 1898-1916*. The remaining twelve chapters follow the same pattern as the first: there is a narrative introduction to the period covered and then individually dated entries for significant events in the history of U.S. naval aviation. Hundreds of photographs of people, places, and machines accompany these event paragraphs, the last being an F-35C over NAS Patuxent River.

One might think that it would be terribly difficult to find a particular aircraft or action in 604 pages of detailed chronology. It would be if it weren't for a superbly organized, 143-page index. The index is

broken into seven parts: aircraft by designation, aircraft by name, missiles and rockets, ships, U.S. military units, individuals, and general. This makes searches of the volume relatively easy, as the reader is pointed to specific dates containing the sought-after information.

That's Vol 1. The second volume contains thirty-nine chapters arranged in seven parts: aircraft, personnel, units, ships, deployments, operations, and other actions. More photos, lists, charts, tables, etc. form the bulk of these chapters (in the last edition, these were appendices). These contain a wealth of information on many topics: combat aircraft procured, aircraft on hand, aviation ratings, early naval jet pilots, naval astronauts, Naval Aviation Hall of Honor, current squadron lineage, aviation ships, carrier and squadron deployments to Vietnam, Operation Desert Fox, and Cold War incidents involving U.S. Navy aircraft are examples of what the reader will find.

In short, between the chronological history in Vol 1 and the specific-subject chapters in Vol 2, there is something in these volumes for nearly every aviation history enthusiast. Modelers, researchers, or those who are simply interested in Navy and Marine Corps aviation have to download these volumes. They come in parts, but any good .pdf assembler can make two nice volumes that are usable on your computer or iPad. What the reader gets is an appreciation of the accomplishments of naval aviation and the changes it has undergone in response to operational, technological, social, and political pressures over its more than 100 years of existence.

Col. Scott A. Willey, USAF (Ret.), Book Review Editor and Docent, NASM's Udvar-Hazy Facility



"The Three Musketeers of the Army Air Forces": From Hitler's Fortress Europa to Hiroshima and Nagasaki. By Robert O. Harder. Annapolis, Md.: Naval Institute Press, 2015. Illustrations. Photographs. Notes. Appendix. Bibliography. Index. Pp. xv, 254. \$39.95 ISBN: 978-1-61251-902-9

Robert Harder is a former B-52 navigator-bombardier who saw extensive service during Vietnam. When he entered active duty, he met then-Col Tom Ferebee, the bombardier on *Enola Gay's* August 6, 1945, Hiroshima mission. From that time, he developed a great interest in Manhattan, the atomic missions of 1945, and the men involved.

The stated goal of this book is not a

history of strategic bombing, the Manhattan Project, or the August 1945 atomic attacks. These are presented only as part of the story of the special bond between Paul Tibbets, Tom Ferebee, and Dutch Van Kirk—the pilot, bombardier, and navigator on August 6. But the story goes back years before, and that is the story Harder relates.

Tibbets had written several books about his life over the years (*The Tibbets Story*, *Return of the Enola Gay*) and was quite well known. Suzanne Dietz wrote an excellent biography of Dutch Van Kirk (*My True Course*) in 2012. Harder quotes liberally from these books. However, very little had been written about Tom Ferebee. The original research of his papers and other sources is Harder's best contribution. His first three chapters cover each of the three men individually from birth to the time they met in Sarasota, Florida, as part of the 97th Bomb Group.

The next three chapters present the 97th's training and deployment to the UK. The three become fast friends and crewmates aboard a B-17F, *Red Gremlin*. Harder covers the early Eighth AF missions they flew, the special missions to take Generals Eisenhower and Mark Clark to Gibraltar prior to the invasion of North Africa, and then combat missions with Twelfth AF out of North Africa. After that, the three went their separate ways for over a year until Tibbets was selected to command the 509th Composite Group, and the three men relinked.

Another of Harder's stated goals was to correct previously published errors, omissions, misperceptions, and other inaccuracies. "I have taken special pains to render the most accurate reconstruction of those two sorties [Hiroshima and Nagasaki] yet attempted." As I know something about the topic myself, I really started paying attention in the chapters "Wendover," "Tinian," "The Big One," "The Rest of the Story," and the appendix, "The Near-Catastrophic Nagasaki Mission." It would take several pages to describe the errors, misinterpretations, and other inaccuracies Harder himself includes in his narrative. A few examples need to be included:

He mentions that *Enola Gay* carried "82" on its nose when it arrived at Tinian on July 6. It was actually "12" until August 5, when the numbers were changed for security. He says that the *Silverplate* aircraft were modified to carry a "welded-in 640-gallon gas tank." They actually carried the same pair of Goodyear 640-gal rubber tanks that any B-29 could carry. A pair was in the aft bomb bay on August 6 to counterbalance the bomb in the forward bay. He states that *Enola Gay* flew four of the Pumpkin bomb missions. Crew B-9

flew four, but only two in *Enola Gay*. He describes the accompanying instrument aircraft (*The Great Artiste*) as measuring heat, blast, and radiation. The three instruments it carried and dropped measured blast only. He has the radar countermeasures officer sitting behind the radar operator. He sat forward of that position. Likewise, he has the assistant flight engineer (scanner) sitting back with the radar and countermeasures officers. He was actually forward at the former gunner's stations. He says Tibbets told the crew about the atomic bomb before the bomb run. He did not tell them until after the weapon had exploded and the aircraft had successfully escaped the blast. According to Harder, *Little Boy* would not explode if the Japanese jammed the radar altimeters. It would have on impact—that had been proven in testing.

There are many other such examples. But the most egregious is that Ferebee had seen the bomb come out of the bay broadside. I'm not sure how a ten-foot-long bomb comes out sideways through a four-foot-wide bay! But it is physically and geometrically impossible to see the bombs from a B-29 (or a B-17) from the bomb-sight position, no matter how he did "a certain manipulation of the bombsight telescopic controls"! The entire paragraph about watching bombs and doing bomb-damage assessments from the nose of a bomber—especially one in a sixty-degree bank—is patently ridiculous.

Normally, I don't like to dwell on minor errors. But there are so many not-so-minor ones in this book that I caught, that one has to wonder how many there might be in areas that I or other readers are not as familiar with. The point is that Harder certainly cleared up some of the inaccuracies found in many publications, but he added a slew of new ones.

Despite these, I think this is a book worth reading for a better understanding of the stories of, and bonds between, three genuine heroes of the strategic air war. But read it with the understanding that not all of the "facts" are fact.

Col. Scott A. Willey, USAF (Ret.), Book Review Editor, and Docent, NASM's Udvar-Hazy Center



Britain's Forgotten Fighters of the First World War. By Paul R. Hare. Stroud, U.K.: Fonthill Media, 2014. Photographs. Pp.160. \$29.95 ISBN: 1-781551979

Paul Hare is well known for his in-depth works on World War I British aircraft. Therefore, it was not at all surprising

to find that he was able to examine seventeen aircraft in this trim little volume. In each instance he was able to provide a general review of the aircraft's design characteristics, production history, date of service and deployment to the front line, as well as some of the service history, including the pilots and squadrons who flew them. In a final look, he goes on to present what could best be described as the aircraft's issues and the type's final disposition.

It did not take the combatants in The Great War very long to grasp that war in the air was a grim reality. Although it was first seen as random events where armed aircraft were intercepting and, in some cases, destroying their opponents. Soon enough it became a regular occurrence. More forward thinking officers on both sides knew that it would be only a matter of time before the enemy would exert primacy with well-armed aircraft. Primarily two-seater reconnaissance aircraft were equipped with machine guns for defensive as well as offensive purposes. The race was on and Germany would gain the initiative with their machine-gun-synchronization gear providing forward firing capabilities to their quick and nimble single-seaters.

Hare begins the book by covering the first instances of the "scout," a concept that was developed prior to the war in what was deemed the military aircraft's most important features—speed and range. In the first chapter he looks at the early instances of "armed scouts," all derived from existing designs. The reader is able to recognize the glacially slow movement of the RFC in producing the true armed fighter—one that would be conceived and designed for the single purpose, not simply an aircraft upgraded or modified for the role.

The second section covers the stopgap-designed fighter in the guise of the pusher. It provided the British with an aircraft that could both defend and compete against the "Fokker Scourge." In the third chapter, Hare describes those aircraft that were just short of the more credible designs, or, as he says "...lacked the vital spark of genius that made a useful fighter into a great one..." In the final chapter, Hare provides a glimpse into those designs covered in the book that can be found in museum collections and are capable of flying.

This book is an interesting look at some lesser-known aircraft and fills a gap in the understanding of the development of fighter aircraft of The First World War.

Carl J. Bobrow, Museum Specialist, National Air and Space Museum



I Wish I Had Your Wings: A Spitfire Pilot and Operation Pedestal, Malta 1942. By Angus Mansfield. Stroud U.K.: The History Press, 2016. Photographs. Bibliography. Index. Pp. 192 ISBN: 978-0-7524-9782-2

Malta, an island in the middle of the Mediterranean Sea, was the best base from which the British could attack German and Italian supply lines that reached from Europe to North Africa during the Second World War. In 1940, Italian air and naval forces besieged the island, planning to starve its British population into surrendering. The German Luftwaffe joined in repeated merciless attacks in 1941.

By 1942, bombing had turned the isolated island into ruin. Most of the starving inhabitants lived in underground shelters; with few supplies remaining and, based on the likelihood of not being resupplied, they calculated a September surrender date. Desperate to avoid losing the island, the British collected a fleet of their fastest and largest merchant vessels with an escort of fighting ships. This force was deployed in Operation Pedestal to resupply Malta. Their victory was costly and horrific.

Mansfield tells of the months leading up to Pedestal and of the operation itself. He primarily uses logbooks, letters, and papers written by Spitfire pilot John Mejor and Merchant Marine captain David Macfarlane to recreate the action that produced a turning point in the war. Macfarlane was Mejor's uncle, but they did not know they were in the fight together until Pedestal ended.

Over Malta prior to 1942, German Ju 87, Ju 88, and Bf 109 and Italian aircraft outnumbered British Spitfires at least five-to-one on a daily basis. Sometimes the odds were as high as twenty-to-one. German and Italian bombers, submarines, and fighting ships destroyed most of the British supply ships that attempted to run the thousand-mile gauntlet from Gibraltar to Malta. Facing minimal opposition, they attacked convoys at will.

Replacement Spitfires made part of the resupply trips aboard aircraft carriers and, when within range of the Malta, launched and fought their way to the island. In one case, forty-seven Spitfires completed the journey, but only six were flyable the day after they arrived.

Mejor's flight log records encounter after encounter, day after day. In addition to being outnumbered, the British fought with a minimum amount of supplies supplemented by an awesome display of determination and courage. Ground crews worked tirelessly to keep the Spitfires flyable, and pilots manned planes on a first-come-first-served basis.

British tactics were primarily defensive, but when the Germans redeployed part of their air force from the Mediterranean to the Russian front, the British stretched their limited resources and switched to an offensive strategy: the Spitfires attacked enemy bombers before they reached the island and avoided dog-fights with the Bf 109s.

Operation Pedestal was the ultimate test of bravery. Mansfield complements Macfarlane's account of the journey from Gibraltar to Malta with narratives from other seamen who survived it. This section of the book stands alone as an example of the conclusive violence of warfare.

My experience with combat has been on the ground and in the air, but the description of what took place at sea far transcended my experiences and even my imagination. Along with reacting to the utter destructiveness, I was amazed by the selfless attitudes of the men involved in the fighting—both airmen and seamen. I strongly recommend this book. Some of its passages will remain with you for a long time.

Henry Zeybel, Austin, Texas.



So I Bought an Air Force: The True Story of a Gritty Midwesterner in Somoza's Nicaragua. By W. W. Martin. Minneapolis Minn.: Two Harbors Press, 2013. Photographs. Maps. Index. Pp. 259. \$16.95 ISBN: 978-1-938690-36-5

If this isn't the ultimate warbird hunter tale, it's up there among the top three. A Chicago businessman with a love of flying, Martin responded to a newspaper ad for a squadron of ex-Nicaragua Air Force P-51s in 1961. With a ready market for these popular aircraft, he arranged to fly them out of Nicaragua and deliver them to buyers in the U.S. Informed the planes were in flyaway condition, Martin expected the job would take a few months. He didn't know what he was getting into. General Somoza, the strongman ally of the U.S., ran Nicaragua in the 1960s. In return for stability and resistance against Communism, the U.S. supplied him with weapons and did not focus on his chosen leadership methods, a process repeated in many Latin American countries during that troubled era. The result was a dictatorship in which human rights were trampled and corruption was pervasive.

It was into this unsavory stew that Martin stepped off a Pan Am airliner in 1961. Soon he found the intensive maintenance required by these worn-out warplanes more than a match for local repair

capabilities. The pace of work was anything but quick: control cables frayed; engines seized; electrical systems shorted out; and ancient components failed without warning. A few months stretched into two years. When he finally flew out the last few P-51s in 1965, Martin had lost seven of approximately twenty-five aircraft he had bought—not bad, considering the challenges. The warbird community was enriched by almost twenty P-51s as a result.

This well-organized, detailed book is Martin's account of his frequently perilous adventures. The incidents described happened over fifty years ago, yet Martin writes as if it were yesterday. His lively, fresh narrative leads the reader through crash landings in remote areas, encounters with machete-toting civilians, treacherous mercenaries, and obfuscating embassy personnel. More than once he was the only one in a negotiating session not carrying a machine gun. Through it all Martin maintained an air of calm composure and good humor that enabled him to prevail where others would long since have given up.

Martin valued people the most. He found Nicaraguans warm and approachable and made many friends. He generously credits their steadfast support in helping him complete his often dispiriting quest. The disastrous 1972 earthquake ended the Somoza era and the Nicaragua he knew; the last chapter includes an accounting of the fates of many of the people portrayed.

Martin kept notes and manuscripts and carried a camera everywhere. Apparently—and surprisingly—he was able to take pictures at will. The full-color photos are tied closely to the text, illustrating points and incidents as they occurred, giving the book an immediacy and intimacy. The index is relatively brief but helpful. Martin includes the basics of Nicaraguan politics from standard histories to place his own adventures in context.

As did Hans Wiesman in *Dakota Hunter*, Martin descended into the depths of unstable, potentially violent political situations to claim his prize. He exhibits those characteristics that Nick Veronico (*Hidden Warbirds*) calls for in a good warbird hunter: patience; perseverance; strict adherence to local, national, and international laws regarding warbird salvage; and savvy knowledge of the mechanical idiosyncrasies and flying characteristics of his quarry. Lots of other warbird hunters spend a few weeks or months on the tip of the spear; Martin put in two years. It is a wonder he survived.

The P-51 (some of Martin's tail num-

bers are still flying) remains a robust presence in the warbird arena. Although covered in many volumes over the years, readers wanting to know more about this popular aircraft will find such newer works as Graff's *P-51 Mustang: Seventy-Five Years of America's Most Famous Warbird* (2015), Lowe's *North American P-51 Mustang* (2009), and O'Leary's *North American Aviation P-51 Mustang (Osprey Production Line to Frontline 1)* (1998) helpful. Cotter's *North American P-51 Mustang: 1940 Onwards (all marks) (Owners' Workshop Manual)* (2011) helps the reader understand the technical challenges that Martin and his mechanics faced.

Destined to be a classic, this is a book you'll want to read and re-read. Although issued as a paperback with a perfect binding, it deserves a hardcover edition. A digital version is planned.

Steve Agoratus, Hamilton, New Jersey.



Flights of No Return: Aviation History's Most Infamous One-Way Tickets to Immortality. By Steven A. Ruffin. Minneapolis, Minn.: Zenith Press, 2015. Maps. Illustrations. Photographs. Bibliography. Index. Pp. 256. \$30.00 ISBN: 978-0-7603-4792-8

Aviation history is filled with stories of flights that never returned. When hearing of such flights most people—and certainly the readers of this journal—immediately become interested. And in cases where the causes are mysterious or unknown, or where the flights involve particularly noteworthy individuals or missions, the one-way trips continue to hold our interest long after the event. That's what this book is: a collection of stories about flights that failed to complete their missions with a successful arrival at the intended destination.

For each of the flights, Ruffin presents a summary of the facts, laying out clearly and succinctly what is known about the incident. He then explores the rest of the story—the “why” of the failed return. “Why” runs the gamut from easily explained to utter mystery, and Ruffin does a good job of presenting the possible explanations, even when they strain believability.

Summarized here are a few of the stories.

John F. Kennedy, Jr., his wife, and sister-in-law were killed in a light plane accident in July 1999. It is generally accepted that the accident happened because Kennedy, a non-instrument rated pilot,

flew into meteorological conditions he wasn't qualified to handle. Ruffin presents this analysis, but also acknowledges that there are conspiracy theorists who believe the incident was an assassination carried out by a foreign intelligence agency.

Perhaps the most famous flight of no return is that of Amelia Earhart, who vanished in July 1937, while flying around-the-world. Ruffin addresses each of the major theories that might explain the disappearance of Earhart and navigator Fred Noonan, the most likely of which is that they got lost, ran out of fuel, and then crashed and sank. But other possible explanations are also covered: they landed on a tiny island and starved to death awaiting rescue, they were captured and executed by the Japanese military, or (most bizarrely) Earhart survived the war and in 1970, was found living under an assumed name as a housewife in New Jersey.

One of the more interesting military stories concerns a B-24 Liberator bomber known as *Lady Be Good*. On April 4, 1943, the aircraft and her crew were on their first combat mission, a raid that took them from North Africa to Naples, Italy. They never returned—not a unique event, as many aircraft were lost without explanation during the war. But the mystery was solved in 1958, when a British oil exploration team found the wreckage. Subsequent discoveries left no question as to the fate of the crew. They had become lost returning from the mission, flew past their base in the dark, and bailed out of the aircraft. The unmanned airplane flew to a near-perfect crash landing in the desert, and the crew perished while attempting to walk to safety.

Among the other stories are the death of record-setting aviator and balloonist Steve Fossett in a light plane accident, the loss of bandleader Glenn Miller during World War II, the mysterious case of the hijacker known as DB Cooper, and the 1937 Hindenburg disaster.

For someone who has even the slightest interest in these and other “flights of no return,” the book is highly recommended. Many of the stories will be familiar, but almost everyone can expect to find stories that are new. All the accounts are fascinating, and in every case Ruffin's narrative is clear and highly readable. He has taken an interesting subject and made it more interesting with the quality of his writing.

Lt. Col. Joseph Romito, USA (Ret.), Docent, National Air and Space Museum's Udvar-Hazy Center and National Mall Facility



Sonic Wind: The Story of John Paul Stapp and How a Renegade Doctor Became the Fastest Man on Earth. By Craig Ryan. New York: Liverwright Publishing Corp., 2015. Photographs. Appendix. Notes. Index. Pp. 411. \$27.95 ISBN 978-0-87140-677-4.

John Paul Stapp was a brave and innovative scientist and physician who contributed to aerospace medicine, aviation safety, the early U.S. space program, and the wellbeing of everyone who travels by motor vehicle. Craig Ryan previously wrote about high-altitude ballooning in *The Pre-Astronauts* and co-authored *Come Up and Get Me*, the autobiography of legendary Air Force test pilot, fighter pilot, and balloonist Joe Kittinger. So, he was already familiar with Stapp and well prepared to take on his multi-faceted career. The book is based on interviews, personal papers, key technical reports, and the publicity that Stapp's activities generated.

Stapp worked his way through college during the Great Depression, eventually earning a Ph.D. in biophysics from the University of Texas in 1940. He then became an MD at the University of Minnesota in 1944, before serving as an Army medical officer. The AAF soon began to reap the benefits of Stapp's education and talents at the Aero-Medical Laboratory, such as his discovery of how to avoid decompression sickness (the bends) on high-altitude flights. Captured German records provided some useful data in this and other areas, such as ejection seats, but he was appalled at the Nazis' inhumane abuse of concentration camp inmates, many of whom died gruesomely. Stapp used himself for the most dangerous human testing, no matter how hazardous. But he also relied on animals—including chimpanzees, bears, and pigs—an increasingly controversial practice.

Stapp is best known for his pioneering work between 1947 and 1955, on surviving rapid acceleration, wind blast, and deceleration using rocket-propelled sleds on specialized test tracks. Under primitive conditions on a remote corner of Muroc Field, California (later renamed Edwards AFB) and with better facilities and a more advanced test track featuring an ingenious water braking system at Holloman AFB, New Mexico, Stapp and his small team expanded the envelope on forces the human body can endure if properly restrained and protected. Stapp's findings were responsible for enormous improvements in cockpits, ejection seats, flight suits, helmets, shoulder harnesses, and parachutes. And passengers flying on military transports can blame Stapp for having to face backwards in their seats (or

thank him in case of a crash landing).

Stapp became internationally famous as “the fastest man on earth” on a rocket sled named *Sonic Wind*. On his 29th and final run on December 10, 1954, he reached a top speed of 639 mph before coming to an abrupt stop after just 8 seconds. Probably no one else will ever accelerate to Mach .84 in five seconds at twenty Gs and then come to a dead stop in less than 1.4 seconds at 46.2 negative Gs—all while sitting out in the open air!

As head of the Aero Medical Field Lab at Holloman, Stapp led a wide variety of other cutting-edge experimentation and testing. His 120-foot “Daisy Track” achieved forces of up to 200 Gs investigating both aircraft and ground vehicle crashes. These tests made him an influential advocate for automobile safety. In 1955 he hosted the first of what came to be known as Stapp Car Crash Conferences. Much of the book deals with his role in coaxing industry and government to improve the once dismal chances of drivers and passengers surviving serious accidents.

Stapp experimented with high altitude balloons, proving that humans could survive extended periods at the edge of space and—as so famously demonstrated by Capt. Joe Kittinger—survive parachuting from over 100,000 feet. He was an early enthusiast of manned space flight and was a key participant in selecting NASA’s Mercury astronauts.

Stapp’s celebrity and hyperactive professional life, including conferences and contacts with the media, often displeased his Air Force superiors—a recurring theme in Ryan’s narrative. Ryan also portrays Stapp’s eccentricities and often troubled family relations. The book is peppered with interesting anecdotes, such as giving birth to Murphy’s Law and finding time to make house calls to military families needing medical care. There is strong circumstantial evidence that it was Stapp who taped Chuck Yeager’s broken ribs the night before he broke the sound barrier in 1947. Twenty-five years later Stapp was gratified when Joe Kittinger thanked him for his work on aircrew survivability that allowed Kittinger to eject with only a minor cut when his F-4 Phantom was struck by a North Vietnamese missile while speeding over Mach 1.

Stapp finished his Air Force career on loan to the National Highway Traffic Safety Administration from 1967-1970 and remained there several more years as a contractor. Frustrated with life in Washington (including the automobile industry’s lobbying success and the Nixon Administration to go slow on auto safety measures), he retired to Alamogordo. This gave me, as the historian at Holloman

AFB in the early 1970s, the chance to meet the renowned Dr. Stapp.

After reading this book, I can appreciate his legendary status even more. Despite all the abuse he had put his body through, Stapp lived to be eighty-nine. Even confined to a wheelchair with an oxygen bottle, he attended the 43rd Stapp International Car Crash Conference in San Diego in October 1990, just a month before he died of a heart attack in his Alamogordo home. Thanks in large part to him, hundreds of military aviators and hundreds of thousands of automobile occupants have not been disabled or killed before their time.

Lawrence R. Benson, retired Air Force historian



A War of Logistics: Parachutes and Porters in Indochina, 1945-1954. By Charles R. Shrader. Lexington, Ky.: The University Press of Kentucky, 2015. Maps. Tables. Figures. Photographs. Notes. Glossary. Bibliography. Index. Pp. xv, 488. \$52.80 ISBN: 978-0-8131-6575-2

In the past, Bernard Fall’s history lessons and Jean Larteguy’s thinly-veiled fiction have told me all I want to know concerning France’s involvement in Indochina. Now, however, historian Charles Shrader has presented new perspectives of the war between French Union and Viet Minh forces. He describes the “First Indochina War” as a “war in which logistics decided the outcome.” His research proves that poor logistical support can (and, in this case, did) defeat an army. Seventy pages of notes validate his depth of research.

The book is based on declassified contemporary French official documents and U.S. intelligence material, reports and memoirs of French participants and Western observers, and a wide range of secondary studies. Viet Minh sources are limited to contemporary documents captured by the French, prisoner of war interrogations, and the writings of Ho Chi Minh and Vo Nguyen Giap. Maps, tables, figures, and photographs abound to support the text.

The first half of the book explains the influence of Viet Nam’s terrain on the war’s participants. Most of the fighting took place in the Red River area in the north. The rugged terrain stymied the development of a system of highways, railroads, and waterways capable of supporting military activities on the scale used in World War II.

Working from that background,

Shrader discusses the disproportionate sizes of the opposing combat forces, explains how their logistical systems were organized and operated, and compares their opposing transportation systems. He presents detailed summations of the dependency for war supplies that the Viet Minh had with Communist China and the French Union had with the United States.

At that time, air power was far less available than what America employed during its later involvement in Vietnam. Helicopters were scarce and used primarily for medical purposes. Poor weather conditions, widely scattered airfields, limited numbers of aircraft and aircrews, and constantly improving Viet Minh anti-aircraft capability minimized the effectiveness of the French Union air force. The Viet Minh had no air support.

The book’s second half describes the war itself and explains how logistical factors influenced the outcome of combat operations. Shrader follows the paths of conflicts from the end of the Japanese occupation of Indochina through the rise of the Viet Minh and their eventual conquest of the French Union at Dien Bien Phu.

Initially, a series of political and military actions forced the Viet Minh to find refuge in the countryside while the French occupied the cities. From there, differing military philosophies pitted the mobility of the self-sufficient individual Viet Minh soldier against the mobility of the technologically-dependent French Union army. What began as merely ambushes by the Viet Minh grew into head-on collisions with the French. Shrader’s chapter titles tell the war’s story: “The Campaign for the Lines of Communication,” “The Limits of Aerial Resupply,” and “The Triumph of the Porters.” Logistically the French relied on mechanized transportation and air and sea shipments from France (often four months away). Meanwhile, on a daily basis, Viet Minh porters carried supplies on their backs from the border with Communist China.

Shrader presents a continuous string of eye-opening stories and facts. For example, the French Union employed a third of its infantry forces in Indochina to keeping roads and waterways open to traffic. Both sides had about ninety battalions, but the French assigned sixty-four of theirs to protecting lines of communication and rear areas, leaving only twenty-five battalions for mobile offensive operations. Basically, the French Union’s logistical effort went toward resupplying posts whose manpower protected trucks and boats from ambush in order to resupply themselves. Meanwhile, dispersed groups of Viet Minh porters moved nearly unopposed along trails hidden in the jungle.

Accounts of the Viet Minh's invasion of Laos and of the battle for Dien Bien Phu are as fresh and interesting as if they occurred yesterday. "The Viet Minh refused to recognize the theoretical limitations on their logistical capabilities, and they frequently surprised the French by their rapidity of movement, their ability to concentrate men and supplies undetected, and their logistical stamina." Further, "The Viet Minh proved decisively that...even in the mid-twentieth century, a lack of superiority in material could still be overcome by the intelligent application of sheer manpower and a determined will." Frequently, I visualized Fall and Larteguy nodding in agreement with Shrader's conclusions.

This book saddened me—again. Much of what Shrader tells us reminded me of America's business in Vietnam. Every fact in his book was available before the United States committed itself to the Vietnam War and then generally duplicated the French Union's ineffective efforts. Say no more?

Henry Zeybel, Austin, Texas.



Hell's Angels: The True Story of the 303rd Bomb Group in World War II. By Jay A. Stout. New York: Berkeley Caliber, 2015. Map. Photographs. Notes. Bibliography. Index. Pp. 454. \$27.95 ISBN: 978-0-425-27409-5

Jay Stout, a former Marine Corps pilot and veteran of Desert Storm, has established himself as one of the leading chroniclers of military aviation. He has had eight previous books published in the past fifteen years or so. This most-recent effort follows *Fighter Group: The 352nd "Blue-Nosed Bastards" in World War II*. In *Hell's Angels*, he tackles the American portion of the Combined Bombing Offensive from the perspective of the men who served in the 303rd Bombardment Group (Heavy), one the many bombing outfits equipped with the Boeing B-17.

Writing unit histories is a tricky proposition, since there is a tendency to become bogged down in a repetitious litany of missions. In this instance, Stout, for the most part, avoids this trap by interjecting into virtually every chapter a discussion of various facets that routinely effected either the mission or the lives of those involved. Using letters, diaries, and interviews intertwined with official records, he weaves together the unit's combat history.

He selected the 303rd because it was among the very earliest groups based in

England to enter combat. Along the way, it achieved numerous firsts (e.g., first unit to fly 200 missions). One of its aircraft, nicknamed *Hell's Angels*, completed twenty-five missions before the legendary *Memphis Belle*.

While this may be familiar territory for most readers of *Air Power History*, I was quite impressed with the thoroughness of the research and the attention to detail. One gruesome aspect discussed several times was the murder of downed crewmembers by German civilians. For me, this begs the question of how Luftwaffe crewmembers were treated by British civilians. By repeatedly interjecting very succinct analytical passages into the overall narrative, Stout had created a very easy read.

This book provides a sound foundation for understanding the strategic-bombing campaign at the grassroots level. For example, the discussion of the special challenges facing the ball-turret gunner seemed right on the mark. In another instance, Stout covered the impact of airborne radar during the final year of the war. This particularly interested me, since my father-in-law served as a radar technician with the 480th Bomb Group. I highly recommend *Hell's Angels* for World War II generalists—in particular individuals related to personnel who served with B-17 units in England.

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



Pioneering American Rocketry: The Reaction Motors, Inc. (RMI) Story, 1941-1972. By Frank H. Winter and Frederick I. Ordway, III, eds.. San Diego: Univelt, 2015. Diagrams. Photographs. Notes. Appendices. Index. Pp. xiii, 462. \$95.00 hardcover, \$75.00 paperback ISBN: 978-0-87703-619-7 and 978-0-87703-620-3 respectively

This book is Volume 44 of the American Astronautical Society History Series. It is the life history of a small, but significant, contributor and innovator to the success of American rocketry from the earliest days to the Moon lander. RMI, later Reaction Motors Division after acquisition by Thiokol, powered the earliest X-planes, including the X-1, D-558-2, and the X-15; provided the vernier and attitude motors for the lunar lander; and propelled the MX-774 rocket, the progenitor of the Atlas missile. This is the story of a small band of pioneers, largely laboring in the shadow of luminaries such as Werner von Braun, who achieved signifi-

cant advances in American rocketry.

With the exception of the first chapter, the book is a compilation of papers presented to the International Academy of Astronautics. The introduction, in addition to acknowledgments, presents brief biographies of the founders of RMI. Chapter 1 sets the historical context and examines the roots of RMI in a largely rural area of New Jersey. The remaining seven chapters are edited papers prepared and presented by several of the founders of RMI and follow the development of RMI until acquisition by Thiokol as Reaction Motors Division (RMD) and the eventual dissolution of the division in 1972.

Winter and Ordway did an excellent job of editing the papers in such a way as to neatly blend each into the next and maintain an orderly progression. The book is not intended to be light reading; the original papers were intended for and presented to a highly technical audience. However, the extensive use of back notes, a form of footnotes, provides context and explanations. References and notes are provided at the end of each chapter by the editors. A particular strong point for future researchers in this genre is the listing in the index of all RMI artifacts held by the National Air and Space Museum.

If there are any complaints about the book, one would have to be the lack of an explanation of regenerative cooling. The development of this technology forms the basis for much of RMI's and, later, RMD's impact on the history of rocketry. This may be understandable, since the intended audience was probably more than familiar with the details. However, a simple primer would have aided understanding by a larger readership. Another deficiency is that a better, more professionally prepared schematic of the various rocket motors built by RMI would make the history somewhat easier to follow.

Overall, this book is highly recommended, but for a narrow audience of readers interested in the comprehensive history of American rocketry.

MSgt. Al Mongeon, USAF (Ret.)



Area 51: The Graphic History of America's Most Secret Military Installation. By Dwight Jon Zimmerman. Minneapolis Minn.: Zenith Press, 2014. Maps. Illustrations. Pp. 91. \$19.99 paperback ISBN: 987-0-7603-4664-8

Dwight Zimmerman does an excellent job of capturing the unique history of Area 51. He covers its beginning as part of

the Nevada Test and Training Range in 1951, through the development and fielding of multiple weapon systems, and finishes by delving into the mysteries of what might be under test today. Greg Scott's dramatic illustrations accompany the writing and give the overall story a wonderful visual connection and often capture an interesting emotional side to these secret operations. It is mostly factually correct.

The book starts with the alien controversy of Roswell and the UFO craze of the 1950s and 1960s. The focus then shifts to President Eisenhower's requirement to gather critical national information after the Soviets detonated nuclear devices. The U.S. had to know what the Soviets were doing in nuclear development, bomber and missile fielding, and overall national defense in light of the ongoing Cold War. As the Soviet Union was a closed country, little actionable information came out through normal means. The President approved the building of the U-2, an aircraft designed to overfly the Soviet Union to collect—hopefully covertly—this critical information. A secret test location was needed that would be away from public

scrutiny, secure, remote, and centered in the west where most of the advanced U.S. aviation industry was located. Lockheed had the contract. The company's chief test pilot, Tony Levier, flew over the Nevada and California desert areas in 1954, and identified Groom Lake as a superb location. Kelly Johnson concurred, and the CIA set up Area 51 inside the nuclear test area for additional intrusion protection.

The U-2, A-12, SR-71, F-117, and a whole variety of drones were tested there. Captured MiG aircraft were evaluated there. The MiGs were then used to secretly train Navy, Marine, and USAF flight crews to correct the dismal results our forces were having in early air-to-air combat engagements against the North Vietnamese Air Force.

There are a number of errors that readers should be aware of. The original U-2A range was 3400 nm, not 5,500 nm. The YF-12A was never considered to be a nuclear bomb carrier. The A-12's operational altitude was around 90,000 ft not 97,000 ft, and their operational life on Okinawa lasted from May 1967-May 1968. In December 1966, President Johnson decided to mothball the A-12 fleet before

any operational missions had been flown. The code name Big Safari is not an NRO codename for some of its drone programs. It is a USAF organization that does quick-reaction acquisition and vehicle modifications for all our armed services and many government agencies. Two A-12s were modified to become M-12 Mach 3+ drone launchers. The program was titled Tag-board and, on the fourth mission, not the first, on June 30, 1966, the launched drone collided with the launching aircraft and both were destroyed over the Pacific. Rumors for years have speculated of a vast underground tunnel system which does not exist. However, many tunnels were constructed to support underground nuclear tests in the areas adjacent to Area 51. During the Arab-Israeli war in 1973, it was the SA-6, not the SA-5, that proved so devastating to the Israelis. Despite these errors, this is a very readable history of an important installation.

Col. Buz Carpenter, USAF (Ret.), former SR-71 Instructor Pilot, and docent, National Air and Space Museum



PROSPECTIVE REVIEWERS

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

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We seek quality articles—based on sound scholarship, perceptive analysis, and/or firsthand experience—which are well-written and attractively illustrated. The primary criterion is that the manuscript contributes to knowledge. Articles submitted to *Air Power History* must be original contributions and not be under consideration by any other publication at the same time. If a manuscript is under consideration by another publication, the author should clearly indicate this at the time of submission. Each submission must include an abstract—a statement of the article's theme, its historical context, major subsidiary issues, and research sources. Abstracts should not be longer than one page.

Manuscripts should be double-spaced throughout, and prepared according to the *Chicago Manual of Style* (University of Chicago Press). Use civilian dates and endnotes. Because submissions are evaluated anonymously, the author's name should appear only on the title page. Authors should provide on a separate page brief biographical details, to include institutional or professional affiliation and recent publications, for inclusion in the printed article. Pages, including those containing illustrations, diagrams or tables, should be numbered consecutively. Any figures and tables must be clearly produced ready for photographic reproduction. The source should be given below the table. Endnotes should be numbered consecutively through the article with a raised numeral corresponding to the list of notes placed at the end.

Electronic submissions are preferred. Articles should be submitted via e-mail as an attachment, in Microsoft Word. Electronic photographs and graphics should be copied to a CD and mailed if they exceed 5-8 megabytes.

There is no standard length for articles, but 4,500-5,500 words is a general guide.

Manuscripts and editorial correspondence should be sent to Richard Wolf, Editor, *c/o Air Power History*, 6022 Cromwell Pl. Alexandria, VA 22315, e-mail: airpowerhistory@yahoo.com.

Books to Review

Prodger—Trending Collectibles 2015 Military Aviation Review WW1-WW2. 143p.

Renfrew—Wings of Empire: The Forgotten Wars of the Royal Air Force, 1919-1939. 288p.

Wahlman—Storming the City: U.S. Military Performance in Urban Warfare from World War II to Vietnam. 368p.

History Mystery Answer



The Air Force legend is General Curtis Lemay. General Lemay is often more commonly remembered for his demanding leadership and being pivotal to success of strategic bombing in both the European and Pacific theaters during World War II. Lemay is also remembered as the father of Strategic Air Command. Before Lemay rose to be the Chief of Staff of the Air Force, he was selected to be the lead navigator on the mission to locate the Italian Ocean liner Rex. On the morning of May 12th 1938, three B-17s departed Mitchel Field, New York under marginal weather conditions and located the Rex in the open ocean 620 miles off the coast helped demonstrate the long

range aspects of airpower and using airpower for defense. An NBC reporter flying aboard one B-17s broadcast the event live coast-to-coast.

To learn more about the mission to intercept the Rex, go to: <http://www.airforcemag.com/MagazineArchive/Pages/2008/December%202008/1208rex.aspx>

To learn more about General Lemay, read his autobiography: *Mission with LeMay: My Story* by Curtis Lemay and MacKinlay Kantor

Coming Up



Compiled by
George W. Cully

April 1-4, 2016

The **National Air & Space Museum** will host its biennial Mutual Concerns for Aviation Museums Symposium to be held at three successive locations in the New York City area beginning at the symposium's conference hotel, the Hyatt Regency Jersey City on the Hudson. For more details, check the Museum's website at <http://airandspace.si.edu/events/mutual-concerns/>.

April 7-10, 2016

The **Organization of American Historians** will hold its annual meeting at the Providence Convention Center in Providence, Rhode Island. The theme of this year's gathering will be "On Leadership." For more information as it becomes available, see the Organization's website at www.oah.org/meetings-events/meetings-events/call-for-proposals/.

April 11-14, 2016

The **Space Foundation** will host its 32nd annual Space Symposium at the Broadmoor Hotel in Colorado Springs, Colorado. For particulars, see the Foundation's website at www.spacefoundation.org/events.

April 14-17, 2016

The **Society for Military History** will hold its 83rd annual meeting at the Canadian War Museum in Ottawa, Canada. This year's theme is "Crossing Borders, Crossing Boundaries." For conference details, visit the Society's website at www.smh-hq.org.

April 22-23, 2016

The **Center for Western Studies** will hold its 48th annual Dakota Conference in the Fantle Building on the campus of Augustana University in Sioux Falls, South Dakota. This year's theme will be "World War II Comes to the Northern Plains: 1941-2016." For more information, visit the Center's website at www.augie.edu/dakota-conference.

April 28-30, 2016

The **Army Aviation Association of America** will host its premier annual event, the Army Aviation Mission Solutions Summit, at the Georgia World Congress Center in Atlanta, Georgia. This year's gathering includes the induction of three new members into the Army Aviation Hall of Fame. For details, see the AAAA's website at www.quad-a.org/2016Summit/index.php/about

May 2-5, 2016

The **Association for Unmanned Vehicle Systems International** will host its annual premier gathering, "Xponential 2016," at the Ernest M. Morial Convention Center in New Orleans, Louisiana. For more particulars, see the Association's website at www.xponential.org/auvsi2016/public/enter.aspx.

May 4-6, 2016

The **Council on America's Military Past** will hold its annual meeting in Frederick, Maryland. For more details as they become available, check the Council's website at www.campjump.org/Annual%20Conferences.htm.

May 4-6, 2016

The **National Naval Aviation Museum** will host its annual Naval Aviation Symposium at the Museum on the grounds of Pensacola Naval Air Station, Pensacola, Florida. For additional information, see the Museum's website at www.navalaviationmuseum.org/event/naval-aviation-symposium-2016/.

May 17-19, 2016

The **American Helicopter Society** will hold its 72nd annual Forum and Technology Display at the Palm Beach County Convention Center in West Palm Beach, Florida. This year's theme is "Leveraging Emerging Technologies for Future Capabilities." For meeting particulars, see the Society's website at www.vtol.org/annual-forum.

June 2-5, 2016

The **American Fighter Aces Association** will hold its annual meeting at the Westin DFW Hotel North in Irving, Texas. For more details, check the Association's website at <http://www.americanfighteraces.org/2016%20assets/2016%20AFAA%20Print%20Consolidated%20Doc.pdf>.

June 3-8, 2016

The **American Society of Aviation Artists** will hold its 30th annual International Aerospace Art Exhibition Forum at the James C. Weston Gallery in the Arts Council of Greater Kalamazoo in Kalamazoo, Michigan. The exhibit will continue thereafter until June 25. For more details, view the Society's website at www.asaaavart.org/visitors/forum2016_CFE.php.

June 8, 2016

The **National Museum of the United States Air Force** will open its fourth exhibit hall to the public. The new building will display more than 70 aircraft in four new galleries — Presidential, Research & Development, Space and Global Reach. For details, see the Museum's website at www.nationalmuseum.af.mil/Expansion.aspx.

June 22-25, 2016

The **Three Society Meeting** is held every four years and brings together three organizations dedicated to the study of the history of science, technology, and medicine: the **British Society for the History of Science**, the **Canadian Society for the History and Philosophy of Science**, and the **History of Science Society**. This year's meeting, the eighth, will be held at the University of Alberta in Edmonton, Alberta, Canada; the theme of the meeting is 'Transitions'. For more information, see the meeting website at <https://uofa.ualberta.ca/arts/research/3-societies-meeting>.

June 22-26, 2016

The **Society for the History of Technology** will hold its annual meeting and conference on the campus of University Town (UTown), an extension of the NUS Kent Ridge campus of the National University of Singapore (NUS). For details, see the Society's website at <http://shot2016.org/home.php>.

July 5-10, 2016

The International Organization of Women Pilots, better known as **The Ninety-Nines**, will host its annual conference in Ottawa, Canada. For more details, see their website at www.ninety-nines.org/conference.htm.

July 22-26, 2016

The **International Committee for the History of Technology** will hold its 43rd annual meeting in Porto, Portugal. This year's theme will be "Technology, Innovation, and Sustainability: Historical and Contemporary Narratives." For further information, visit the Committee's website at www.icohtec.org/annual-meeting-2016.html.

September 7-8, 2016

The **Armed Forces Communications and Electronics Association** and the National Security Alliance will host the third Intelligence & National Security Summit 2016 at the Walter E. Washington Convention Center in Washington, D.C. For more info, see the Association's website at <http://events.jspargo.com/inss16/public/enter.aspx>.

September 8-10, 2016

The **Tailhook Association** will hold its annual symposium and reunion at the Nugget Hotel in Sparks, Nevada. For details, see the Association's website at www.tailhook.net/A_Reunion_Page.html.

September 13-16, 2016

The **American Institute of Aeronautics and Astronautics** will host its annual premier event, Space 2016, at the Long Beach Convention Center in Long Beach, California. For additional information, visit the Institute's website at www.aiaa-space.org/?_ga=1.250442310.1576745014.1445537679.

September 19-21, 2016

The **Air Force Association** will hold its 2016 Convention and Air & Space Conference and Technology Exposition at the Gaylord National Hotel in National Harbor, Maryland. For more information, see the Association's website at www.afa.org/afa/home.

September 21-24, 2016

The **Society of Experimental Test Pilots** will hold its 60th annual Symposium and Banquet at the Grand Californian Hotel in Anaheim, California. For more details as they become available, see the Society's website at www.setp.org/annual-symposium-banquet/60th-annual-symposium-banquet-info.html. October 3-5, 2016

September 27-30, 2016

The **Aircraft Engine Historical Society** will hold its annual meeting in Dayton, Ohio. For more details, see the Society's website at www.engine-history.org.

October 1, 2016

The **National Aviation Hall of Fame** will induct its 54th group of honorees—astronaut Captain Robert Crippen, USN; fighter ace and Vietnam War POW Colonel George "Bud" Day, USAF; NASA Mission Control Center director Christopher "Chris" Kraft; and aircraft; and aerobatic champion Tom Poberezny—at the Hall's Learning Center co-located with the National Museum of the United States Air Force in Dayton, Ohio. For additional information, see the Hall's website at www.nationalaviation.org/.

October 1-2, 2016

The **National Museum of the United States Air Force** will host its WWI Dawn Patrol Rendezvous to commemorate the 100th anniversary of WWI in Europe. For details, see the Museum's website at www.nationalmuseum.af.mil/Upcoming/WWIDawnPatrol.aspx.

October 3-5, 2016

The **Association of the United States Army** will hold its annual meeting and exhibition at the Walter E. Washington Convention Center in Washington, D.C. Over 600 exhibitors are expected to attend. For more information, see the Association's website at <http://ausameetings.org/2016annualmeeting/>.

October 12-16, 2016

The **Oral History Association** will hold its annual meeting at the Renaissance Hotel Long Beach in Long Beach, California. The theme this year is "OHA@50: Traditions, Transitions and Technologies from the Field." For further details, see the Association's website at www.oralhistory.org/annual-meeting/.

November 17-19, 2016

The **National World War II Museum** will host its latest International Conference on WWII at the Museum in New Orleans, Louisiana. This year's theme is "1946: Year Zero, Triumph and Tragedy." For more details, see the Museum's website at www.ww2conference.com/splash/.

November 29-December 1, 2016

The **Association of Old Crows** will hold its annual meeting at the Marriott Marquis DC and Convention Center in Washington, DC. For additional info, ping a Crow at www.crows.org/conventions/conventions.html.

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:

George W. Cully
3300 Evergreen Hill
Montgomery, AL 36106
(334) 277-2165
E-mail: warty@knology.net

Reunions

1st Fighter Assn Sep 7-10, 2017, Dayton, Ohio. Contact:

Bob Baltzer
1470 Foxtale Ct,
Xenia, OH 45385
937-427-0728
robertbaltzer@sbcglobal.net

12th TFW (MacDill AFB & Vietnam),
12th FEW/SFW (Bergstrom AFB & Korea) Apr 20-24, 2016, Charleston, South Carolina. Contact:

E. J. Sherwood
480-396-4681
EJ12TFW@cox.net

20th SOS Sep 15 2016, Dayton, OH Continued Sep 16-18, 2016, Kokomo IN Contact:

Jim Woodbury
2210 West Judson Rd,
Kokomo, IN 46901
765-432-1577
j-swoodbury@comcast.net

22nd Military Airlift Sqn Jun 7-10, 2016, Fairborn, OH Contact:

Ray Daley
4775 Dayton-Springfield Rd,
Springfield, OH 45502
937-318-2418
the2orfs@aol.com

95th Bomb Group. May 6-7, 2016, Dayton, Ohio. Contact:

Meg Brackney
261 Northwood Dr,
Yellow Springs, OH 45387
937-767-2682
meggyjb@yahoo.com

306th Bomb Group. Sep. 14-18, 2016, Fairborn, Ohio. Contact:

Thom Mindala
3244 S Lamar St,
Denver, CO 80227
303-980-9400
tmindala76@aol.com

324th Fighter Group (WWII) (314th, 315th, 316th Fighter Squadrons. Jun. 22-26, 2016, Fairborn, Ohio. Contact:

Joe Secino
29 Doe Way,
Fredericksburg, VA 22406
540-752-2487
jsecino@aol.com

366th Fighter Assn. Sep. 19-24, 2017, Fairborn, Ohio. Contact:

Paul Jacobs
8853 Amarantha Ct,
Reynoldsburg, OH 43068
614-866-9791
paul@jacob.net

446th Bomb Group. Jun. 2-6, 2016, Fairborn, Ohio. Contact:

Linda Anderson
2267 Palm Dr,
Colorado Springs, CO 80918
719-574-9197
biekerl1@earthlink.net

496th Fighter Interceptor Squadron Jun 13-16, 2016, Akron, OH. Contact:

Mac McFarland
16145 Chibiabos Trail,
Doylestown, OH 44230
330-658-2232
cjm1142@aol.com

510th Fighter Squadron Assn. Aug. 11-14, 2016, Fairborn, Ohio. Contact:

David Nichols
6510 Cottage Dr,
Bellaire, MI 49615
davelaurienic@yahoo.com

623rd Airborne Control & Warning. Sep. 18-22, 2016, Dayton, Ohio. Contact:

Sherry Mills
P.O. Box 25806,
Colorado Springs, CO 80906
719-380-1412
sherry@acompletetereunion.com

664th Airborne Control & Warning Squadron Veterans Reunion for USAF Radar Station Veterans Worldwide. Jun. 24-26, 2016, Bellefontaine, Ohio. Contact:

Billy Stafford
P. O. Box 12,
Bellefontaine, OH 43311
937-287-9240
wildbill@columbus.rr.com

821st Security Police - Ellsworth AFB, SD Sep 30 - Oct 2, 2016, Dayton, OH Contact:

Al Seguin
2021 Renford Pointe,
Marietta, GA 30062
770-578-6881
aaseguin@yahoo.com

4477th Test & Evaluation Squadron. Sep. 8-11, 2016, Fairborn, Ohio. Contact:

Ted Drake
1212 Westmont Dr,
Southlake, TX 76092
817-251-8614
teddrake@aol.com

4950th Test Wing/Aria 328 Memorial May 6, 2016, Fairborn, OH. Contact:

Bob Beach
1616 Ridgeway Dr,
Springfield, OH 45506-4023
937-325-6697
ariabob@woh.rr.com

AC-119 Gunship Assn. Sep 28-Oct 1, 2017, Fairborn, Ohio. Contact:

Ron Julian
4919 Appaloosa Trail,
Fairborn, OH 45324
937-546-3219
ac.119.2017@gmail.com

AeroMed Evac Assn. Apr 13-16, 2016, Fairborn, Ohio. Contact:

John Killian
723 Placer Dr,
Woodland, CA 95695
530-662-2285
Johnjan1571@sbcglobal.net

Vietnam/Thailand Air Force "Sky Cops". Apr 28 - May 1, 2016, Fairborn, Ohio.

540 West Livingston St,
Celina, OH 45822
419-586-3076
pathouseworth@gmail.com

F-15 Gathering of Eagles 44. Jul 28-31, 2016, Fairborn, Ohio. Contact:

Donna Friedman
2508 Cedronella Dr,
Chapel Hill, NC 27514
919-382-7271
donnafriedman@nc.rr.com

Ranch Hands Veterans Assn. Oct 6-9, 2016, Fairborn, Ohio. Contact:

Dick Wagner
8260 Bryn Manor Ln,
Germantown, TN 38139
901-754-1967
cowboy6869@att.net

Sampson AFB Veterans Assn. May 12-14, 2016, Fairborn, Ohio. Contact:

Hal Fulton
2833 Mara Loma Cr,
Wooster, OH 44691
330-264-5200
fasu@aol.com

List provided by:

Rob Bardua
National Museum of the U.S. Air Force
Public Affairs Division
1100 Spaatz Street
WPAFB, OH 45433-7102
(937) 255-1386

Gentlemen:

I thoroughly enjoyed the articles on early SIGINT and the article on Aerial Recon in the early Cold War period. However, I did notice an error in the latter article involving the description of the loss of a U.S. Navy P2V-5 Neptune. The article stated that a Navy PBM Mariner seaplane crashed on takeoff after landing to retrieve the Neptune's crew. That Mariner aircraft was actually a U.S. Coast Guard PBM-5G, CG# 84738, one of 43 operated by the USCG between December 1944 and May 1958. The aircraft and its 8 crew members was based out of Coast Guard Air Detachment (CGAD) Sangley Point, Philippine Republic, and had been scrambled to search for the downed P2V

crew. After locating the Neptune crew, the aircraft commander of the PBM assessed the sea surface conditions as a 25 to 30 knot wind with seas running 15 feet. After taking the P2V crew aboard, the pilot, LT John Vukic, who survived the mission, reported that power was lost in the port engine and with insufficient speed to continue the takeoff, the pilot opted to abort the takeoff and to ditch the PBM. However, the resulting re-contact with the rough water conditions caused the aircraft to break up.

Just a thought to correct a minor mistake by not mentioning the PBM was a USCG machine.

Keep up the outstanding work, I love the magazine. I usually pass my copy to [someone who] will love this copy and surely appreciate the articles in this

issue or how it was done in the old days.

Respectfully,

William M. (Mike) O'Rourke
Herndon, Virginia

Thank you Mr. O'Rourke for your detailed correction of my account of the P2V-5 Neptune rescue. I agree that it is important to get the facts right and appreciate your observation of the Coast Guard's vital and often dangerous role both during the Cold War and today.

Sincerely,

John Farquhar

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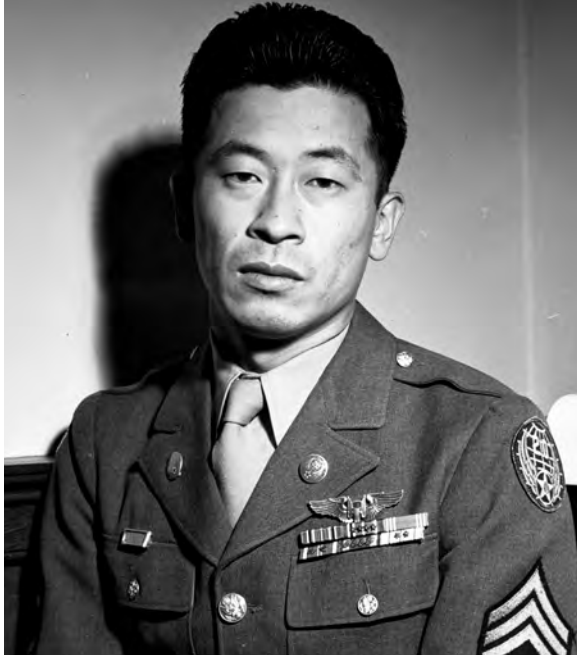
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ed@afhistory.org

Ben Kuroki (1917-2015)



Ben Kuroki was the only American of Japanese descent in the United States Army Air Forces to serve in combat operations in the Pacific theater of World War II. He flew a total of 58 combat missions over Japan, Europe and North Africa during World War II.

Ben Kuroki was born in Gothenburg, Nebraska, United States to Japanese immigrants, Shosuke and Naka (née Yokoyama) Kuroki on May 16, 1917. They had 10 children. When he was a year old the Kuroki family relocated to Hershey, Nebraska, where they owned and operated a farm. The Lincoln County town had a population of about 500. He attended Hershey High School and was the Vice-President of his senior class, graduating in 1936.

After the Attack on Pearl Harbor in 1941, Ben's father encouraged him as well as his brother Fred Kuroki to enlist in the U.S. Military. His brothers Bill and Henry also served in the military during the war. The two Kuroki brothers enlisted in the U.S. Army, two of the very first Nisei to do so.

Assigned to the 93rd Bombardment Group at Fort Myers, Florida, he was told that Japanese Americans would not be allowed to serve overseas. In 1942 Kuroki petitioned his commanding officer and was allowed to work as a clerk for the Eighth Air Force at a base in England. The need for aerial gunners was high and after Kuroki volunteered, he was sent to gunnery school for two weeks and became a dorsal turret gunner on a B-24 Liberator, the most widely produced American heavy bomber to be used by Allied forces in World War II.

Kuroki was in a B-24 that crash landed in Spanish Morocco and was captured by Spanish authorities. His crew was released by the Spanish after three months. After the U.S. Department of State secured his release, he returned to England and rejoined his squadron.

On August 1, 1943, he participated in the dangerous bombing mission known as Operation *Tidal Wave*, an effort to destroy the major oil refinery located in Ploiesti, Romania. Kuroki flew 30 combat missions in the European theater, when the regular enlistment only required 25. After a medical review, he was allowed to fly 5 more missions above the mandated enlistment. Kuroki said he did so for his brother Fred, who was still stationed stateside. On his 30th mission he was slightly injured when his gun turret was hit by flak.

During rest and recovery back in the United States, Kuroki was directed by the Army to visit a number of Japanese American internment camps in order to encourage able-bodied males to enlist in the U.S. military. Kuroki was the subject of a number of news articles including one in Time magazine.

Kuroki requested but was denied the opportunity to participate in the Pacific theater. Only after the intervention of Henry Stimson, the Secretary of War was that request granted. Kuroki was later permitted to join the crew of a B-29 Superfortress (who named its plane *Sad Saki* after Kuroki) in the 484th Squadron, 505th Bombardment Group, 20th U.S. Army Air Force, based on Tinian Island. Kuroki then participated in another 28 bombing missions over mainland Japan and other locations.

Kuroki is the only Japanese American known to have participated in air combat missions in the Pacific Theater of Operations during the war. Kuroki was awarded one Distinguished Flying Cross for his 25 missions in Europe and another for participation in the Ploiești raid. After another 28 missions in the Pacific Theater, Kuroki was awarded a third Distinguished Flying Cross as well as the Air Medal with five oak leaf clusters. By the end of the war, Ben Kuroki had completed 58 combat missions and was promoted to the rank of Technical Sergeant.

Fiercely patriotic, but understanding first hand some of the racial and other inequalities minorities had to endure, after the war Kuroki continued to speak about the need for racial equality and against prejudice. He engaged in a series of speaking tours discussing these issues, which he funded with his own savings and with minor donations, including proceeds from Ralph G. Martin's biography written about him entitled "*Boy From Nebraska: The Story of Ben Kuroki*". When asked about his battle to overcome prejudice which almost prevented him from being allowed to participate in overseas aerial combat missions, Kuroki stated, "I had to fight like hell for the right to fight for my own country".

Kuroki later attended the University of Nebraska, attaining a Bachelor's degree in journalism in 1950. He was a reporter and editor for a number of newspapers in several different states, retiring in 1984.[2] On August 12, 2005, Kuroki was awarded the Distinguished Service Medal for his impressive combat participation during the war and for overcoming numerous incidents of prejudice. He is survived by his wife, two daughters, his sister Rosemary Ura; four grand- one great-grandchild.

Sir Michael Beetham, RAF (Ret.) (1923-2015)



Marshal of the RAF Sir Michael Beetham, passed away in October, 2015.

Beetham was eighteen when he volunteered for the RAF and pilot-trained in the U.S. On his return to England, he converted to Lancasters and joined No. 50 Squadron in November 1943, just as the Battle of Berlin began and he flew over the "Big City" no less than ten times. He flew on the disastrous raid to Nuremberg on the night of March 30/31, 1944 when ninety-six bombers failed to return. Such losses had a profound affect on the twenty-year old Beetham.

He went on to survive thirty operations over Germany when the losses were at their highest. An outstanding pilot, he received the DFC for his gallantry and leadership. After a period training bomber crews, he returned to operations and dropped food supplies to the starving Dutch population during April and May 1945.

After the war, he remained in the RAF and served at HQ Bomber Command. In August 1949, he assumed command of No.82 Squadron flying Lancasters on photographic survey and aerial mapping for the Colonial Office in East and West Africa. In 1953 he was at the Air Ministry where the issues of bringing the three V-bombers into service took up much of his time. Five years later he joined the force when he commanded No.214 Squadron operating the Valiant. The squadron was about to embark on air-to-air refuelling trials and Beetham coordinated the programme. On July 9, 1959 he and his crew took off from Marham and headed for South Africa. Refuelling

in flight twice, they arrived over Capetown after a flight of 11 hours 28 minutes. A few days later they returned in just over twelve hours. These two non-stop flights broke the speed record for the distance and provided a convincing demonstration of the feasibility and potential of air-to-air refuelling. For his work, Beetham was awarded the AFC.

In 1964, he was sent to Aden to command Khormaksar, then the RAF's largest operational base, operating a wide variety of tactical and transport aircraft, but no bombers. In August 1972, he became Assistant Chief of Staff (Plans and Policy) at SHAPE. He worked under the charismatic and bullish American General Alexander Haig and his work was at the heart of NATO policy making, in particular the nuclear planning aspects.

After a period as the Deputy C-in-C at Strike Command, he left in January 1976 to be the C-in-C of RAF Germany and Commander Second Allied Tactical Air Force. His RAF squadrons were in the midst of a major aircraft re-equipment programme and there was great emphasis on the ability of his airbases to survive any pre-emptive attack. He always maintained that his time in Germany was one of his most challenging and satisfying.

Beetham became CAS on August 1, 1977 inheriting the appointment at a difficult time and at a relatively young age. He was nearing retirement when the Argentineans invaded the Falkland Islands on April 2, 1982. He put the RAF's transport fleet on standby, despatched Nimrods to Ascension Island and pressed successfully for the employment of RAF Harriers from the Navy's aircraft carriers.

With his great knowledge of strategic bombing and his expertise on air-to-air refuelling, he assessed whether a bombing attack against Port Stanley airfield was feasible. Beetham saw it as a potent illustration of the case for the strategic impact and flexibility of air power. A few months after the end of the Falkland's conflict, he retired from the service. For four years he was chairman of GEC Avionics Ltd but the RAF remained his greatest love. For many years he continued to have an influence on numerous service issues, all with a view to improving its capabilities and public image.

He was instrumental in placing the RAF Museum on a sound financial footing and his services were recognised in 2002 when the museum's new conservation centre at RAF Cosford was named after him. For many years he was President of the Bomber Command Association. He was instrumental in the erection of a statue to his wartime chief, Sir Arthur Harris, at the RAF Church of St Clement Danes in London. He poured his energy and influence, into the creation of a major memorial to all the lost aircrew of Bomber Command. Despite failing health, he was determined to see the culmination of his efforts and he was able to attend the dedication of the memorial by HM the Queen in Green Park in July 2012.

Until his final days, he continued to have a keen interest in the activities of the RAF Historical Society of which he was a founder member and president. In addition to his gallantry awards he was appointed GCB (1978), KCB (1976) and CBE (1967). He was also awarded the Polish Order of Merit.

Air Commodore G R Pitchfork RAF (Ret.)



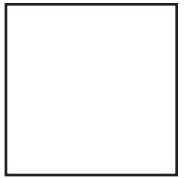
While a pilot and more well known for his piloting and leadership, in the early part of his career this Air Force great's strong navigational skills led to his being the navigator for several pre-World War II airpower and aviation demon-

strations. These included the first mass flight of B-17s to South America, the finding of the Italian Ocean liner Rex off the east coast of the United States. Who was this Air Force legend?





Air Force *Historical* Foundation
P.O. Box 790
Clinton, MD 20735-0790



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