

# AIR POWER

WINTER 2015 - Volume 62, Number 4  
WWW.AFHISTORICALFOUNDATION.ORG

# *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.

The Foundation’s four primary activities include a quarterly journal *Air Power History*, a book program, a biennial symposium, and an awards program.

## MEMBERSHIP BENEFITS

All members receive our exciting and informative *Air Power History Journal*, either electronically or on paper, covering all aspects of aerospace history

- Chronicles the great campaigns and the great leaders
- Eyewitness accounts and historical articles
- In depth resources to museums and activities, to keep members connected to the latest and greatest events.

Preserve the legacy, stay connected:

- Membership helps preserve the legacy of current and future US air force personnel.
- Provides reliable and accurate accounts of historical events.
- Establish connections between generations.





# AIR POWER

## History

Winter 2015 - Volume 62, Number 4  
WWW.AFHISTORICALFOUNDATION.ORG

### Features

- “The Airplane and I Grew Up Together”: Hugh L. Dryden and the Rise Of American Aeronautics and Spaceflight  
*Michael H. Gorn* 6
- Ferret: Evolution of a Design Concept  
*Bill Cahill* 22
- Aerial Reconnaissance, the Press, and American Foreign Policy, 1950-54  
*John T. Farquhar* 38

### Book Reviews

- Libyan Air Wars Part I: 1973-1985*  
By Tom Cooper, Albert Grandolini, & Arnaud Delalande Review by Scott A. Willey 52
- They Gave Me a Seafire*  
By R. Mike Crosley Review by Steven Agoratus 52
- Check Six! A Thunderbolt Pilot's War Across the Pacific*  
By James C. Curran & Terrance G. Popravak, Jr. Review by Al Mongeon 53
- Operation Chowhound: The Most Risky, Most Glorious U.S. Bomber Mission of World War II*  
By Stephen Dando-Collins Review by Frank Willingham 53
- The Bridge to Airpower: Logistic Support for the Royal Flying Corps Operations on the Western Front, 1914-18*  
By Peter Dye Review by Thomas Wildenberg 54
- To Rule the Winds: The Evolution of the British Fighter Force through Two World Wars, Volume 1*  
By Michael C. Fox Review by Joseph Romito 54
- Flying Warbirds: An Illustrated Profile of the Flying Heritage Collection's Rare WWII-Era Aircraft*  
By Cory Graff Review by Daniel J. Simonsen 55
- Intercept 1961: The Birth of Soviet Missile Defense*  
By Mike Gruntman Review by Rick W. Sturdevant 55
- Fighter Aircraft Combat Debuts, 1915-1945: Innovation in Air Warfare before the Jet Age*  
By Jon Guttman Review by Frank Willingham 56
- The Georgetown Set: Friends and Rivals in Cold War Washington*  
By Gregg Herken Review by John Cirafici 56
- Alan Turing: The Enigma*  
By Andrew Hodges Review by Golda Eldridge 57
- First to Fly: The Story of the Lafayette Escadrille, the American Heroes Whoe Flew for France in WWI &*  
By Charles Bracelen Flood Review by Robert Huddleston 57
- Yanks in the RAF: The Story of the Maverick Pilots and American Volunteers Who Joined Britain's Fight*  
By David Alan Johnson Review by Lawrence R. Benson 58
- Melvin Laird and the Foundation of the Post-Vietnam Military, 1969-1973*  
By Richard A. Hunt Review by John T. Farquhar 59
- To Kill Nations: American Strategy in the Air-Atomic Age and the Rise of Mutually Assured Destruction*  
By Edward Kaplan Review by Joseph Romito 60
- Viking Spitfire: The Story of Finn Thorsager*  
By Tor Idar Larsen & Finn Thorsager Review by Steven Agoratus 60
- Whitey: The Story of Rear Admiral E.L. Feightner, A Navy Fighter Ace*  
By Peter B. Mersky Review by Golda Eldridge 61
- Airpower Reborn: The Strategic Concepts of John Warden and John Boyd*  
By John Andreas Olson, ed. Review by Steven Agoratus 62
- Images of America: The Oregon Air National Guard*  
By Terrence G. Popravak, Jr., & Sean M. Popravak Review by Steven Agoratus 62

### Departments

- Books To Review 63
- Upcoming Events, Reunions, and In Memoriam 64
- New History Mystery 68

COVER: X-15 #3 with its F-104A chase aircraft touch down at Edwards AFB. (NASA Photo.)

# The Air Force Historical Foundation



## Air Force Historical Foundation

P.O. Box 790  
Clinton, MD 20735-0790  
(301) 736-1959

**E-mail: [ofcmgr@afhistoricalfoundation.org](mailto:ofcmgr@afhistoricalfoundation.org)**  
**On the Web at <http://www.afhistoricalfoundation.org>**

### Board of Directors

Maj Gen Dale W. Meyerrose, USAF (Ret.)  
Chairman  
Lt Gen Charles L. Johnson II, USAF (Ret.)  
First Vice Chairman  
Lt Gen Stephen G. Wood, USAF (Ret.)  
Second Vice Chairman  
Lt Gen Christopher D. Miller, USAF (Ret.)  
Secretary  
Col Thomas A. Owens, USAF (Ret.)  
Treasurer  
Col Scott C. Bishop, USAF (Ret.)  
Col William J. Dalecky, USAF (Ret.)  
Lt Col (Dr.) Dik Daso, USAF (Ret.)  
Lt Col Steven Gress, Jr., USAF (Ret.)  
Ms. Jonna Doolittle Hoppes  
CMS John R. (Doc) McCauslin, USAF (Ret.)  
Mr. Daniel R. Sitterly, USAF SES

**Editor, *Air Power History***  
Richard I. Wolf

**Editor Emeritus, *Air Power History***  
Jacob Neufeld

### Staff

Lt Col James A. Vertenten, USAF (Ret.)  
Secretary to the Board and  
Executive Director  
Mrs. Angela J. Bear, Office Manager

### Patron Members

Col Gerald F. Christeson, USAF (Ret.)  
Col Dennis M. Drew, USAF (Ret.)  
Maj Gen Charles J. Dunlap, Jr., USAF  
Mr. Darrell Dvorak  
Capt Robert Maxson, NOAA  
Gen James P. McCarthy, USAF (Ret.)  
Lt Gen George D. Miller, USAF (Ret.)  
Mrs. Marilyn Moll  
Col Bobby Moorhatch, USAF (Ret.)  
Col J Calvin Shahbaz  
Brig Gen William L. Shields  
Lt Col Kenneth W. Sublett  
Lt Col Raymond C. Tagge, USAF (Ret.)

### President's Circle

Col William J. Dalecky, USAF (Ret.)  
Col Wray Johnson, USAF (Ret.)

### Wing

Northrop Grumman  
Mr. Michael Clarke

### Squadron

Maj Gen John S. Patton, USAF (Ret.)  
ROKAF Historical Foundation

### Flight

Dr. Richard P. Hallion  
Lt Gen Christopher Miller, USAF (Ret.)  
Lt Gen Michael A. Nelson, USAF (Ret.)  
Col Wayne C. Pittman, Jr., USAF (Ret.)  
Maj Willard Strandberg, Jr., USAF (Ret.)

### CORPORATE SPONSORS

**Gold Level (\$10,000 or more)**  
Lockheed Martin Corporation  
Torchmark Corporation

## AIR POWER *History*

The Journal of the  
**Air Force Historical Foundation**  
Winter 2015 Volume 62 Number 4

**Editor**  
Richard I. Wolf

**Editor Emeritus**  
Jacob Neufeld

**Book Review Editor**  
Scott A. Willey

**Advertising**  
Jim Vertenten

**Circulation**  
Angela J. Bear

*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.

Address **LETTERS TO THE EDITOR** to:

Air Power History  
6022 Cromwell PL  
Alexandria, VA 22315  
e-mail: [airpowerhistory@yahoo.com](mailto:airpowerhistory@yahoo.com)

Correspondence regarding missed issues or changes of address should be addressed to the **CIRCULATION OFFICE**:

Air Power History  
P.O. Box 790  
Clinton, MD 20735-0790  
(301) 736-1959  
e-mail: [ofcmgr@afhistoricalfoundation.org](mailto:ofcmgr@afhistoricalfoundation.org)

### ADVERTISING

Jim Vertenten  
P.O. Box 790  
Clinton, MD 20735-0790  
(301) 736-1959  
e-mail: [execdir@afhistoricalfoundation.org](mailto:execdir@afhistoricalfoundation.org)

Copyright © 2015 by the Air Force Historical Foundation. All rights reserved.  
Periodicals postage paid at Clinton, MD 20735 and additional mailing offices.

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

This issue leads off with a longer than average piece, the first of a planned annual series on the life of Hugh L. Dryden, who spent over eighteen years at the head of the NACA and then as Deputy Director of NASA. Dr. Michael H. Gorn is an expert on this extremely influential aviation pioneer, and will be contributing an annual piece of the Dryden story. This installment begins the story, and carries it through the education and formative years.

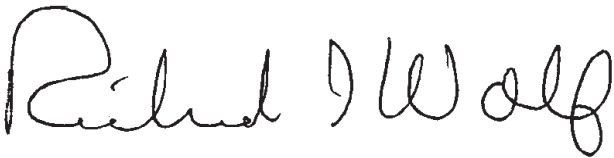
The second article, by Bill Cahill, is about the early development of the ferret aircraft, the nascent period when eavesdropping aircraft were being invented and perfected. It's a very interesting development, although it was not always smooth sailing.

The final article is by John T. Farquhar, professor at the U.S. Air Force Academy, and winner of this year's "Best Air Power History Article" and honored at the annual awards dinner. The article is about the impact of aerial reconnaissance on foreign policy in the early 1950s, and will probably contend for next year's award.

On page 4 please note the entire panoply of this year's Foundation Award winners. On page 5, be sure to take in the President's Message for the end of the year. We also have managed to review another nineteen books in this issue, with the able assistance of Scott Willey, our Book Review Editor. If you have any thoughts about reviewing one of the available volumes, be sure to get in touch with Scott. We would love to add to our stable of able reviewers.

On a more somber note, we acknowledge the passing of a couple of old hands from the Office of Air Force History on pages 66 and 67. They will be missed. We also include our usual roster of upcoming events and reunions on pages 64 and 65. If you turn to page 68, you can view the latest of the New History Mystery chapters. Enjoy.

Lastly, the Foundation wishes to acknowledge the contributions of all of our members who participated in and attended the just completed symposium at the National Defense University, "Violent Skies: The Air War over Vietnam." Over 140 people took the opportunity to revisit a number of topics from the Vietnam Conflict. We hope to be able to publish some of the articles in upcoming issues of *Air Power History*.



*Air Power History* and the Air Force Historical Foundation disclaim responsibility for statements, either of fact or of opinion, made by contributors. The submission of an article, book review, or other communication with the intention that it be published in this journal shall be construed as prima facie evidence that the contributor willingly transfers the copyright to *Air Power History* and the Air Force Historical Foundation, which will, however, freely grant authors the right to reprint their own works, if published in the authors' own works.

# 2015 Foundation Awards



The Foundation's James H. "Jimmy" Doolittle Award, which recognizes a unit that has displayed bravery, determination, discipline, "esprit de corps" and superior management of joint operations was awarded to the 509th Bomb Wing, Whiteman Air Force Base, Missouri. The Award was accepted on behalf of the 509th Bomb Wing by its Commander, Brig. Gen. Paul W. Tibbets IV. Fittingly, the Doolittle Award was presented (above left) by Jonna Doolittle (center), granddaughter of Gen. James H. "Jimmy" Doolittle. To her immediate left is Maj. Gen. Scott A. Vander Hamm, Assistant Deputy Chief of Staff, Operations, Headquarters U.S. Air Force. Also pictured are Maj. Gen. Meyerrose and CMS Winegar, 509th BW Command Sergeant Major. With the Pentagon in view behind him, Brig. Gen. Paul W. Tibbets IV (above right) spoke about his unit's greatest achievements. Big Gen. Tibbets is the grandson of Paul W. Tibbets, Jr. – who piloted the aircraft that dropped an atomic bomb on Hiroshima, Japan.



(Above left) The Best Air Power History Article Award for 2014 was Dr. John T. Farquhar (right), who was honored for his piece titled: "Arctic Linchpin: The Polar Concept in American Air Atomic Strategy, 1946-1948." Dr. Farquhar received the award from Maj. Gen. Meyerrose. (Above right) The Best Air Power History Book Award winner for 2014 is "Project 9: Birth of the Air Commandos in World War II" by Dr. Dennis Okerstrom (right).



(Left) Dr. Richard P. Hallion (center) received the Major I. B. Holley Award, in recognition of his lifetime contributions. Dick Anderegg, the former Air Force Historian, assisted Maj. Gen. Meyerrose with the presentation. The Foundation's Gen. Carl A.



"Tooey" Spaatz Award, awarded for a lifetime contribution to the making of Air Force history, went to General Ronald R. Fogleman (USAF Ret, second from right), Chief of Staff of the U.S. Air Force from 1994-1997. Gen. Meyerrose's presentation was assisted by last year's winner, General Lloyd "Fig" Newton, (left) and Carl Andrew Spaatz Thomas, grandson of Tooey Spaatz.



# From the President

Dear Foundation Members and Friends:

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 generous support. It has been a memorable year for your Foundation. Earlier we shared the news of a very generous bequest from one of our longtime members. As we noted, this gracious gift will go a long way towards ensuring a sound financial future for your Foundation. The funds have been prudently invested to provide a solid financial foundation for the operation and growth of our organization for years to come. This will not only enable us to pursue our mission of educating senior leaders and the public on the importance of *Air Power* for the achievement of our Nation's goals, but expand our member services and support.



Next, please allow me to briefly recap a very momentous week we experienced in October. In the short span of four days we held our annual Doolittle Awards Ceremony and Awards Banquet, followed immediately by the symposium "Violent Skies: The Air War Over Vietnam." Judging from the response of those who attended either or both events, they were resounding successes. The 509th Bomb Wing of Whiteman AFB, Missouri, was this year's Doolittle Award recipient. Its commander, Brig Gen Paul Tibbets IV, accepted the award before a great many of the Wing's alumni. That evening's Banquet honored some excellent historical writers, Dr. Dennis Okerstrom and Dr. John T. Farquhar, plus notable figures in the annals of Air Force History, Dr. Richard Hallion, the Holley Award winner, and General Ronald Fogleman, winner of the Spaatz Award. Last Year's Spaatz Award winner, General Lloyd "Fig" Newton and former Historian of the Air Force, Dick Anderegg, assisted in the presentations. We were very fortunate to have present two descendants of note: Jonna Doolittle, grand-daughter of Gen Jimmy Doolittle, and Carl Andrew Spaatz Thomas, Tooeys' grandson. Please review the brief pictorial report on the facing page, and on our website as listed here: [http://afhistoricalfoundation.org/events/2015-Awards-ceremonies\\_Photo-report.asp](http://afhistoricalfoundation.org/events/2015-Awards-ceremonies_Photo-report.asp)

On October 15th and 16th, your Foundation, with our sister service historical foundations, co-hosted a joint symposium entitled "Violent Skies: The Air War over Viet Nam"—celebrating the 50th Anniversary of those combat operations. The venue for this event was the National Defense University at Ft. Leslie J. McNair in Washington, D.C. An extremely distinguished group of panelists and speakers addressed the many facets of this conflict. Many presenters and attendants offered the opinion that the quality of the presentations and the joint collaboration made this event a standout, one which can and should be used as a model for future efforts.

We are also pleased to report that the Foundation is back in the book publishing arena! Dik Daso's biography of Hap Arnold entitled *Hap Arnold and the Evolution of American Air Power* has been re-issued with our sponsorship. This work is available for sale on our web site, and would make a fine holiday gift. Please visit our online item list at the following: [http://afhistoricalfoundation.org/resources/book\\_program.asp](http://afhistoricalfoundation.org/resources/book_program.asp)

We wish you a happy holiday season, and a healthy and prosperous 2016.

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

# “The Airplane and I Grew Up Together”: Hugh L. Dryden and the Rise of American Aeronautics and Spaceflight

Nat  
S

Armstro





ional Aeronautics and  
Space Administration



ng Flight Research Center



Michael H. Gorn



(Overleaf) The Armstrong and Dryden families pose on the day that NASA Dryden became NASA Armstrong. Also shown: NASA Administrator Charles Bolden (far left); Congressman Kevin McCarthy (seventh from left); and Armstrong Center Director David McBride (fifth from right).

(Above) An official portrait of Hugh Dryden painted during his tenure as NASA's first Deputy Administrator.

With the exception of a few air and space authors who still remember him, Hugh L. Dryden has all but vanished from history even though he became one of the most influential scientists and administrators in the annals of American aeronautics and spaceflight. His loss seems all the more strange because of the drama and appeal of his personal story: he rose to prominence from genuinely humble origins, against long odds.

Dryden's name actually disappeared on a specific date—on May 13, 2014, from the marquee of a remote location in the Southern California desert administered by the National Aeronautics and Space Administration (NASA). On that day, a group of employees, prominent politicians, and members of the media met to re-dedicate this place famous for the world's first supersonic and hypersonic flights.

**Editor's Note:** This is the first of three planned articles on the life of Hugh L. Dryden.

President Barack Obama signed the Congressional legislation four months earlier, and on the occasion itself Representative Kevin McCarthy, who wrote the law and represented the district, attended the event. So did the NASA Administrator Charles Bolden and members of the Dryden family, in addition to relatives of the person about to replace Dryden on the signage.

Since 1976, visitors entering this NASA complex saw the words, "Hugh L. Dryden Flight Research Center"; but now, as a result of the changeover, the honor passed to astronaut Neil A. Armstrong. The new nomenclature happened for a good reason; senior officials on-site had pursued it quietly but persistently for many years. After all, it made political sense. Having Neil Armstrong on the letterhead harnessed his charisma and reputation for the center's good. Even 45 years after his celebrated Moon walk, his fame acted as a bulwark against future attempts to cut or close the facility, a protection unlikely with the almost forgotten Hugh Dryden at the entryway.

Yet, the removal of Dryden did not occur in its full and final form on May 13. In order to soften the blow for the Dryden family (represented at the gathering by his grandson Eric and three of his great-grandchildren), the same legislation redesignated the Western Aeronautical Test Range—protected airspace set aside for the center to conduct research on aircraft and spacecraft—as the Hugh L. Dryden Aeronautical Test Range.

Although well-meaning, this gesture did nothing in the long-term to preserve Hugh Dryden. Indeed, the events of May 2014 stemmed from a precedent that predicted Dryden's demise. In 1999, Congress voted to re-christen the NASA Lewis Research Center in Cleveland, Ohio, as the John H. Glenn Research Center, in recognition of the famous astronaut and U.S. Senator. Until that time it had honored George W. Lewis, the first director of NASA's predecessor organization, the National Advisory Committee for Aeronautics (NACA). Almost as an afterthought, and to appease Lewis' admirers, the lawmakers added the words "at Lewis Field" to the end of the new name. Despite that courtesy, in the years since NASA Glenn came into being George Lewis has almost completely faded from the public mind.<sup>1</sup>

As instructive as the switch from Lewis to Glenn may be, the re-branding of Dryden as Armstrong has far more historical impact. As the NACA's leader, Lewis oversaw important experi-

*Michael H. Gorn, retired Chief Historian of the NASA Dryden (now Armstrong) Flight Research Center, is presently a Research Associate at the National Air and Space Museum, preparing a biography of Hugh L. Dryden. Gorn has written eight books, including Expanding the Envelope: Flight Research at NACA and NASA (winner of the American Institute of Aeronautics and Astronautics' Gardner-Lasser Aerospace History Literature Award). He is also the author of the popular NASA: The Complete Illustrated History, which has been published in five languages. A federal historian for nearly thirty years, he began his career with the Department of the Air Force where he held various staff and management positions, culminating in that of Deputy Chief Historian. He later served as the first Chief Historian of the U.S. Environmental Protection Agency before transferring to NASA. Gorn is a recipient of the Alfred V. Verville Fellowship from the National Air and Space Museum.*





Dryden's hometown: the main street of Pocomoke City, Maryland, about 1908.

IF DRYDEN DID PLAY SUCH A DECISIVE ROLE IN TWENTIETH CENTURY AERONAUTICS AND SPACE-FLIGHT, WHY HAS HE BECOME NEARLY UNKNOWN IN THE TWENTY-FIRST CENTURY?

THE TIMING OF HIS LIFESPAN ADDED TO HIS INVISIBILITY

mental work that improved the first generations of military and commercial aircraft. But his span of influence and technical achievements fall far short of Dryden's, rendering the events of May 2014 of much greater consequence than those of 1999.

At the same time, the recent re-labeling raises perplexing questions. If Dryden did play such a decisive role in twentieth century aeronautics and spaceflight, why has he become nearly unknown in the twenty-first century? And why is it more than likely that he will recede completely now that no specific institution commemorates him? The answers lie partly in when he lived and died, partly in his personal make-up, and partly in situations over which he had no say.

To some extent at least, the timing of his lifespan added to his invisibility. Born in 1898, he grew up too late to benefit from the fame that swept over Orville and Wilbur Wright, while others (like Glenn Curtis and Octave Chanute, to name just two) became more fixed in memory due to their proximity to the first flight. At the other end of his life, Dryden died four years before the Apollo 11 lunar mission, a landmark twentieth-century moment that depended heavily on his counsel. Had he lived to witness it, he would have been interviewed and celebrated.

Additionally, Dryden himself bears much of the responsibility for his loss to history. Perhaps more than any other reason, his own, elusive personality contributed to his disappearance and actually thwarted his highest ambitions. Peculiarly inward-looking and self-contained, he characteristically denied his own ego and refrained from calling attention to himself or his achievements. In fact, he concealed his inner life so skillfully and successfully that even his son (and namesake) considered him an enigma. During his entire 28 years of service with the National Bureau of Standards (years in which he earned a global reputation for his research) he went almost unnoticed by all but his fellow scientists and engineers. And although he later became a bit better recognized when he succeeded Lewis as NACA director, the low profile of this small and little known federal agency enabled it, and him, to evade public scrutiny.

Finally, Dryden fell into obscurity because of developments beyond his control. The job he wanted most—to preside over the new NASA, which would

have guaranteed his place in history—eluded him. He lost his chance when Russia won the initial round of the space race by sending the Sputnik 1 satellite into orbit, a triumph that caused shock and outrage in the U.S. In this atmosphere, Dryden's role at the NACA left him vulnerable to charges that he (along with others) failed to anticipate and counteract the Soviet success. As a result, he found himself out of the running for NASA Administrator. Still, senior officials in the Eisenhower administration knew that the fledgling agency required his talents and experience, so they asked him to be the first Deputy Administrator of NASA. He agreed reluctantly, and it became his last job—one that involved mostly behind-the-scenes leadership, but one that more than made up in influence for what it lacked in public acknowledgement.<sup>2</sup>

## A Son of the Eastern Shore

Hugh Dryden's ancestors first appear in the historical record roughly eight hundred years before his lifetime. They became a recognizable family only after the Norman conquest of Britain in 1066, following which the new regime required those in the Scottish part of the realm to choose surnames based on a place, an occupation, or a patronymic. A band of kinsmen responded by identifying themselves as "draigh" (for thorn) and "den" (for valley)—together, Dredden, eventually Dryden.<sup>3</sup>

Mostly townsfolk, the Drydens worked for centuries as artisans, barbers, soldiers, and fishermen, largely around Edinburgh and the nearby Esk River. But William Dryden, a tailor, and his wife Agnes, broke with tradition. The couple married in 1660, and over the next 20 years Agnes bore eight children.<sup>4</sup> Their lives changed when they became embroiled in a religious controversy that pitted the Anglican Church—which insisted that Scottish worshippers declare allegiance to its bishops and prayer book—against the Presbyterians, who resisted this attempt. William and Agnes took the Presbyterian side, and in 1682 he led, and they both participated in a "tumultuous convocation and riot," for which he received a public whipping and, with Agnes, underwent a short jail sentence.<sup>5</sup>

Stung by the lash of orthodoxy, the Drydens decided to escape England for the far-off colony of Maryland, founded by George Calvert in 1632 under a royal charter. The Calverts accepted settlers not just of their own Catholic faith, but Protestants as well.<sup>6</sup> Accordingly, William and Agnes settled in Somerset town, in Somerset County, at the far southern tip of the Eastern Shore of Chesapeake Bay, where he resumed his old livelihood.<sup>7</sup> Their children subsequently spread out near the tranquil Pocomoke River, and gradually found the lure of agriculture too attractive to ignore. John, their second son, started out as a cooper, but eventually purchased 300 acres. Another son, David, initially a shoemaker and tanner, bought and worked 100 acres just a mile from the Pocomoke.

During the 150 years following the death of David Dryden in 1745, the family continued the

HUGH  
LATIMER  
DRYDEN ...  
BEGAN LIFE  
WITH A NAME  
RICH IN  
PIETY, AS  
WELL AS IN  
EXPECTA-  
TIONS

REALITY DID  
NOT  
MEASURE UP  
TO HIS  
PARENT'S  
HOPES

skilled labor and farming traditions in the same corner of the Eastern Shore. Their wealth and social position remained about as it had been.<sup>8</sup>

But the Drydens who matured at the end of the nineteenth century lived through a more dynamic period, animated by economic forces that unified the nation. Improvements in communications and transportation brought rural people like the Drydens into more frequent contact with the world beyond the Maryland countryside. Indeed, fundamental choices once made locally now depended on distant decision makers. For example, the selection of crops hinged more on the tastes and pocketbooks of expanding urban markets than on regional preferences. The conditions of farm credit relied increasingly on highly concentrated and far-away banking institutions. A unified education system assumed such importance that Maryland created a state board and appointed a superintendent to oversee it. And many of the customary Dryden trades lost ground to distant factory workers who made cheap and replaceable goods.

Paralleling these material changes, the Dryden religious habits also underwent a metamorphosis. Two hundred years earlier, the family had emigrated to America to preserve their Presbyterian principles. But during the last part of the nineteenth century, the Methodist creed began to appear among them, finding favor first with the women. Indeed, the wife, a sister, and a daughter of Isaac T. Dryden all received Methodist burials, as did his son Isaac F. and daughter-in-law Hester Ann Duer, both laid to rest in Quinton Methodist Cemetery in Pocomoke City. Their offspring, in turn, felt entirely at home in the church of John Wesley.<sup>9</sup>

Isaac F. Dryden's second son proved to be an even greater iconoclast. Born in August 1874, Samuel Isaac grew up on his father's farm in Cottage Grove, in Somerset County, but he showed an early liking for book learning rather than physical labor. His school work substantiated his preference. Vincent Hearne, one of his teachers in Pocomoke City, described him as a student with "fine character and qualifications," and "far beyond the average in mental ability. His talent for mathematics," wrote Hearne, "was wonderful." Handsome, self-possessed, and determined, Samuel decided to pursue the professions; he took the first step when he graduated from Pocomoke City High School in 1893 with a first grade teaching certificate.

Pocomoke Principal H.J. Handy agreed with Hearne's assessment and wrote Samuel a glowing letter of recommendation based on his abilities and promise. Handy's backing helped him win a one-year appointment at the Perryhawkin School, located just north of his father's farm. During the same period he served temporarily as Perryhawkin's acting principal and proved so adept that Handy assigned him to be the vice principal of Pocomoke High School.<sup>10</sup>

About this time, Samuel took note of a tall and slender teenage girl with the exotic name of Zenobia, the daughter of George and Lydia Culver. He probably became acquainted with her while teaching at

the Perryhawkin School, where she attended as a student. Five years his junior, Zenobia had a discerning and capable mind, qualities that Dryden must have recognized and appreciated. He married the eighteen year old, known by the nickname "Nova," on December 8, 1897, in Perryhawkin.<sup>11</sup>

About seven months later—on July 2, 1898—Nova gave birth to a baby boy. He began life at the family seat in Pocomoke City, by then a blue collar town of about 1,000 inhabitants. Rather than call the newborn Isaac or William (both favored for Dryden males) Samuel and Nova made a novel choice. Like many in Worcester and Somerset counties, they had been inspired lately by a popular Methodist pastor who assumed the pulpit in Pocomoke City in 1892. Just 31 years old at the time, he attracted a wide following in Southern Maryland and later rose to prominence in his church. So when the young couple christened their child, they thought first of him—the Reverend Hugh Latimer Elderdice. The choice of Elderdice offered an additional grace note; his first two names referred to Bishop Hugh Latimer, the Anglican clergyman who welcomed the Protestant Reformation to England and abetted King Henry VIII's repudiation of Papal authority.<sup>12</sup>

Thus, from the moment Hugh Latimer Dryden opened his eyes, he began life with a name rich in piety, as well as in expectations.

### A Long Journey Begins with the First Step

Unfortunately, reality did not measure up to his parent's hopes. The boy's prospects diminished early, when in 1900 his father left the steady employment of the high school. The reasons can only be guessed, but the departure marked the end of his teaching career. Whether Samuel wanted an occupation that provided more for his wife and child or his strong will had gotten him into trouble, he and his family now found themselves on an unplanned trajectory.

During his time at Perryhawkin, Samuel had often driven his horse and wagon through a tiny rural junction called West Postoffice, consisting of a few simple wood frame houses gathered at an intersection. He and his elder brother Edgar both knew the area well and felt that it could sustain some commercial activity. So Samuel uprooted his family from Pocomoke City and trying to attract the trade of local farmers, formed a partnership with Edgar to open a general store. But good fortune did not smile on the Drydens. They failed to make much money, and their customers complained that their business looked unkempt; more like a shack than anything else. Moreover, Samuel's innate altruism worked against them. Generous and trusting, he extended liberal credit, seldom pressed for re-payment, and donated food to those in need.

Adding to the woes, the educational opportunities at West Postoffice left much to be desired: all of the classes and all grades met in a simple one-room schoolhouse. But as a small boy Hugh enjoyed some compensating social advantages and experiences.



The Drydens arrive in the big city: a crowded downtown Baltimore street, about 1900.



## DRYDEN INHERITED FROM BOTH PARENTS A HIGH DEGREE OF INTELLI- GENCE

The local people readily accepted the youngster and his family and the Drydens made contact with many relations living nearby. Indeed, Hugh grew up with no fewer than twenty-eight paternal first cousins. When they gathered, music united the Drydens; whether at baptisms, weddings, or Fourth of July celebrations, someone took out a fiddle, someone sat down at a keyboard, and they played some familiar tunes.

In addition to the influence of his extended family, Hugh also benefited from a strong bond with his mother, from whom he inherited not just her looks, but her personality as well. Patient and self-effacing, Nova spoke sparingly and accepted life as it came. Yet, in contrast to his warm feelings for her, Hugh felt little kinship with his father. Samuel's swings of generosity and stubbornness, intelligence and hot-headedness seemed uncomfortably volatile to a child of Hugh's steady nature.

Although like his mother emotionally, young Dryden inherited from both parents a high degree of intelligence. Local folks recognized his gift early, based on his precociousness: he could read by age four, more than a year before he entered the West Postoffice school. Yet in other respects he acted like any other youngster; for instance, he craved the arrival of a new playmate in the birth of his brother Raymond in February 1902. The neighbors found both boys to be unremarkable: "very good [and] sensible too."<sup>13</sup>

Once Hugh started school in 1904, his talents became increasingly clear to Samuel and Nova. By the time he celebrated his eighth birthday they fully grasped his unusual promise as he raced through the fifth grade. But this realization dawned just as the Dryden household underwent another major trial.

Their troubles stemmed from the financial Panic of 1907, an event that brought them a cascade of consequences. The crisis originated in New York City where several of the biggest banks invested in highly speculative ventures that failed, causing worried depositors to withdraw their assets in cash. The bankers responded by contracting credit, resulting in the collapse of businesses around the country, including Samuel Dryden's. Already teetering on insolvency, his store had to be closed. But instead of watching passively, he and Nova made a bold decision: they decided to seek opportunity elsewhere. After more than two-hundred years on the Eastern Shore, this group of Drydens decided to try their luck in Baltimore, which offered a higher likelihood of employment for the family's breadwinner and good schools for its clever son. Thus, in summer 1907 Samuel, Nova, Hugh, Raymond, and new baby Edith Elizabeth left their kin and friends and arrived in Maryland's big city.<sup>14</sup>

The worst befell them early in September when Edith died at fifteen months. This blow struck especially hard on the heels of the burial of another of their children, Samuel Isaac, who passed away at 16 months in November 1905. Despite their grief—or perhaps because of it—the Drydens plunged into the complex task of adapting themselves to their unfamiliar surroundings.

Not so much in miles, but in all else, they had ranged far indeed from West Postoffice. The family settled in the midst of the city sprawl, at 1040 North Milton Avenue, in a working class section of midtown Baltimore. Their home stood just 500 feet from the Baltimore and Ohio tracks, which bisected their neighborhood north and south; indeed, the rumbling of the freight cars and the blast of the whistles brought the train schedule to their doorstep.<sup>15</sup>



Hugh Dryden in a photograph taken when he attended Baltimore City College.

In short order, Samuel Dryden discovered his niche. Having lost everything in the panic, he sought an entirely different livelihood, one that offered stability and security. When he heard that the city's transit authority needed streetcar conductors, he applied, got hired, and stayed there for the rest of his career. Of course, this decision ended whatever hopes of advancement may have lingered in this bright and idealistic man.

While steady, Samuel's paychecks only covered essentials, a situation that Hugh could not fail to notice. On the one hand, the new life offered him the opportunities of educational fulfillment and proximity to a broader society. But he also learned that success depended on hard and sustained work. Thus, if Baltimore represented the end of ambition for Samuel Dryden, it opened vast new possibilities for Hugh, impossible to conceive in Pocomoke City or

West Postoffice. Yet, like his father, Hugh paid a price. His experiences imprinted on him at an unusually young age the adult qualities of seriousness, diligence, and responsibility.

Indeed, when Samuel Dryden left home each morning in his round cap and dark uniform trimmed with brass buttons, his son followed him out, mounted his bike, and rode off to throw copies of the *Baltimore Sun* to the neighbors. Apparently, his job instilled a sense of self-worth. When a reader of the *Evening Sun* complained in a letter to the editor about the poor behavior of some youngsters who delivered the paper, Dryden wrote a pointed reply: "The subscriber," he said, "accepts the newsboy as an unavoidable evil, and seems to think that the only way to get the paper on time every day is by threats. Newsboys are thought of as ragamuffins, vagrants. That is all a mistake. The newsboy of today is educated and generally of a good family." Dryden clinched his case when he won the *Sun's* carrier of the year award. Meantime, he augmented his deliveries with summer jobs. Although his small size and boyish face gave away his age, over the next few years he took on some hard tasks: scrubbing floors, standing on the assembly line at the United Biscuit Company, sorting packages for an express delivery service, working at a cannery, and doing manual labor. In fact, he and the other two Dryden sons (the genial and outgoing Raymond, and the last born and more studious Leslie) all contributed to the household's income.

Even though he did his duty to his family, Hugh kept his education foremost in his mind, and he continued to be accelerated. He enrolled first in Public School Number 85, where he completed the remainder of the fifth and sixth grades in just over one year. Then, at Intermediate Public School Number 52—where a group photo showed him and thirteen other boys clad in coats and neckties and as many girls trimmed in hats and dresses—he required only eighteen months to finish grades seven and eight. He graduated from intermediate school in spring 1910 at age twelve—about three years younger than the others in his class. Despite the gap, he excelled scholastically.<sup>16</sup>

Many of his assignments there involved brief essays on history, civics, geography, and the natural sciences. Hugh's compositions revealed an inquisitive nature and a confidence in his own judgment. In a paper entitled "The Fairyland of California," he showed a charming sense of wonder about a far-off place.<sup>17</sup>

*There are parts of California where it is summer all the year round. The flowers always bloom and the trees are always green. In Los Angeles they sometimes have a festival of roses to celebrate the New Year. On a Christmas morning there you could go to the seashore take a bath and come back and set your xmas (sic) dinner under the orange trees. Then you could go up on the mountains and see some of the finest xmas (sic) trees in the world.*





**DRYDEN DID  
ESPECIALLY  
WELL IN  
SUBJECTS  
REQUIRING  
PRACTICAL  
SKILLS**

Dryden did especially well in subjects requiring practical skills. He impressed Mrs. Mary Kennedy, his arithmetic teacher, with his ability to convert weights and measures and to calculate weekly wages and deductions. He took many spelling tests and got high marks. And for excellent attendance he received a prize: a book of religious proverbs entitled *Many Thoughts of Many Minds: A Treasury of Quotations*. In it, he wrote an inscription: “a treasure worth keeping” and he checked a few entries that appealed to him. One, taken from the English clergyman and author Dr. Jeremy Taylor sheds light on his growing and deeply held religious feelings: “Hope is like the wing of an angel, soaring up to heaven, and bearing our prayers to the throne of God.”<sup>18</sup>

After another summer of demanding work, Hugh entered Baltimore City College, a high school with an imposing name and a reputation for being among Baltimore’s finest. He began his studies there optimistic about his future, and enthused by a personal encounter that he had with a thrilling new technology.

\* \* \*

Just after he started classes, Dryden witnessed an event that stirred his imagination, as it did that of thousands of other onlookers who saw similar displays across the United States. This national fixation had its roots in a flight made just six months after Dryden’s birth, when Orville and Wilbur Wright—two obscure bicycle-makers from Dayton, Ohio—tested a prototype glider aircraft. Their vehicle combined a box-like fuselage with an ingenious method of stability and control known as wing

warping. Merging these two concepts gave the Wrights the decisive edge over others seeking to master the bedrock problem of modern aeronautics, expressed by Englishman Sir George Cayley earlier in the nineteenth century: “To make a surface support a given weight by the application of power to the resistance of air.” By the end of 1902, the brothers had perfected the airframe, but they still needed to adapt a suitable engine and drive train. Once they overcame these last obstacles, in December 1903 they became the first to make successful flights in a powered, heavier-than-air machine.<sup>19</sup>

After keeping their invention quiet for several years—long enough to obtain patent protection—the Wrights, along with other pilots, embarked on a wave of aerial exhibitions in the skies over Washington, D.C., New York City, Los Angeles, and many other American cities. When they began in 1908, these demonstrations gripped the nation’s media and attracted vast crowds. Baltimore joined the list of places queued to behold the spectacle of flight and the *Baltimore Sun* offered a prize of \$5,000 to the first flier to attempt it. Sportsman and aviator Hubert Latham accepted the challenge. On November 7, 1910, he strapped himself into his French-made Antoinette monoplane and took off. Light at 1,300 pounds, the little machine performed well, attaining a high speed of forty miles per hour as Latham flew loops over the *Sun*’s downtown offices.

Standing among the other spectators, Hugh Dryden and his mother watched Latham’s flyover in wonder. Nova noticed that her son seemed strongly affected—not so much influenced by the awe that it inspired in the audience, but captured intellectually. He wanted to know how the Antoinette operated

**STANDING  
AMONG THE  
OTHER SPEC-  
TATORS,  
HUGH  
DRYDEN AND  
HIS MOTHER  
WATCHED  
LATHAM’S  
FLYOVER IN  
WONDER**

Pilot Hubert Latham (inset) and an Antoinette aircraft, witnessed by Dryden and his mother in 1910 in an air show over Baltimore.



FROM HIS EARLIEST DAYS AT HIGH SCHOOL IT BECAME CLEAR THAT HE EXCELLED IN MATHEMATICS

mechanically, and wondered about the scientific principles that sustained it. The sight formed a lasting picture in his mind, one that he recalled often in later years.

Four days and a good deal of thought later, Hugh wrote a school paper about Latham's flight. "The Advantages of an Airship Over an Aeroplane" revealed an independent young mind capable of resisting the conventions of the time, as well as his teacher's preconceptions. Although he got an "F" and the comment "Illogical," Dryden grasped the fundamental weaknesses of the Antoinette. He realized that "the least break in [Latham's aircraft would] hurl the aviator to the ground." He also understood its practical limitations: that it flew short distances, carried few passengers, transported little cargo, and traveled too slowly to compete with the railways. This led him to conclude that the dirigible—the competing means of air transit in 1910—offered more advantages "for commerce and exploration, while for the sportsman the aeroplane would be better." In other words, despite their novelty, planes like the one he saw in Baltimore catered to the whims of the well-off.<sup>20</sup>

Of course, Dryden had no way of knowing at age twelve that for nearly fifty years he himself would be at the vanguard of those who transformed the initial, fragile flying machines into one of the defining technologies of the twentieth century.

### A College Man

Dryden felt a mixture of anxiety and anticipation when he left home on the first morning of classes at Baltimore City College. Although the large campus proved to be all that he hoped for, his career there had its setbacks; his relative youth and the school's high standards combined for some humbling experi-

ences, especially during his first semester. In addition to "The Advantages of an Airship Over an Aeroplane" essay, Hugh also received an "F" on a story entitled "An Evening Spent Alone in an Old House," which his English teacher faulted for poor grammar and misused words. After two satisfactory compositions, he got an "F+" on one called "A Winter Scene." His instructor criticized it because "Your sentences lack unity due to an excessive use of 'and'." In his second semester he received the same grade for "The Disaster," about a poor Italian artist whose children destroyed one of his paintings. But by the end of 1911 he had improved enough to earn an Excellent for a biographical sketch about two English men of letters, actor David Garrick and author Samuel Johnson. From that point on his troubles diminished (although he still faced such caustic remarks as "Have you heard of the article 'the'? Use it occasionally—you are not writing a guidebook"). By the end of his time at Baltimore City College his small, precise penmanship and simple, straightforward writing style had become recognizably his own. He had also developed a fondness for books, formed his own little library, and for his thirteenth birthday received the gift of a volume from a classmate.<sup>21</sup>

From his earliest days at high school it became clear that he excelled in mathematics, just like his father who showed so much early promise in the subject. An envious fellow student wrote in Dryden's yearbook, *The Green Bag*: "Behold the future professor of mathematics in general. This kid is some shark when it comes to handling the mystic 3-x, y, z—and what's more, he knows it. Hugh, sweet child, always studies his lessons. Then if he doesn't know them, the prof takes what he says, anyhow."

The scale of his scholastic achievement became apparent during commencement exercises in June 1913, when he became the youngest (at fifteen years





Dryden as a Johns Hopkins student.

**THANKS IN PART TO HIS MENTORS, AS WELL AS TO HIS OWN TALENTS, HE WON THE MARYLAND SCHOLARSHIP AND ENTERED HOPKINS IN FALL 1913**

old) ever to graduate from the school. Because of his age and small size, and because he still dressed in knickerbockers, he looked out of place during the ceremony; yet he ranked first among 172, the largest class in the college's history. He received special recognition when he won the Peabody Prize for Mathematics and when visiting speaker James H. Preston—the Mayor of Baltimore—singled him out for praise.

Not surprisingly, stories about his academic record spread around the city. *Leslie's Illustrated Weekly Newspaper* pictured him in a photograph with the misleading caption, "College Graduate at 14." It also reported that he intended to become a math professor. His boyhood employer, the *Baltimore Sun*, published an article with the headline: "He Graduates at 14. Hugh L. Dryden Breaks Record at City College. Near Wizard in Mathematics." The *Sun* also ran a picture of the youngster in which his relaxed, smiling expression contrasted with his uncomfortably stiff, high collar. "I am so glad to hear of your fine record," wrote one classmate. "You have gained an honor that could not be bought. Congratulate your mother and father for me. I know they must be very proud of you."<sup>22</sup>

Dryden's high school career left almost no doubt about his acceptance wherever he applied to college. But to stay near home (and save the cost of room and board) he picked Johns Hopkins University, a relatively new and well-regarded school in the heart of Baltimore. Yet even Hopkins would be beyond his grasp without extensive financial assistance. During summer 1913, he received help from S.F. Norris and Richard Uhrbrock, two of his City College math teachers who persuaded him to apply for a Maryland State scholarship (which paid all academic expenses for four years) and prepared him for the qualifying exam. Meanwhile, Uhrbrock wrote a splendid reference to the Maryland Scholarship Board on Dryden's behalf. Discounting the hyperbole common in such letters, he made a persuasive case for his pupil. "In my teaching experience of twenty-five years," he wrote, "I have never had a student superior to Hugh Latimer Dryden." Even allowing for exaggeration, Uhrbrock touched on some of the attributes that foreshadowed the adult Dryden.<sup>23</sup>

*He was in my classes in mathematics for nearly three years. At all times his conduct has been that of a gentleman, and his scholarship has been of the very highest order. His presence in the class has been a source of inspiration. He is a quiet and unobtrusive leader. By his work and conduct he has aroused and kept alive interest and enthusiasm in his classmates, without exciting the least jealousy or envy.*

Thanks in part to his mentors, as well as to his own talents, he won the Maryland scholarship and entered Hopkins in fall 1913, with full tuition support. Not only that, during the summer he passed two other tests—one oral, one written—under the direction of L.S. Hurlburt of the Hopkins Mathematics Department. These exams freed him from the requirement of taking analytic geometry. Consequently, when he walked for the first time onto the university grounds at Charles and 34th streets, he entered with advanced standing.<sup>24</sup>

During this formative period at school, Hugh Dryden concentrated on his mathematics classes, but not exclusively. The university encouraged all of its pupils to sample the humanities, and so he found himself taking German, English literature, and history. Indeed, his notebooks overflowed with lessons about the Roman Republic and the American colonial and federal periods. Even with these diversions, however, he completed his college curriculum in just three years, won election to Phi Beta Kappa, and graduated in spring 1916 with honors, once again at the top of his class.

Like most university students, coursework and grades occupied only a part of his time. Dryden already had an appreciation for music from his father's relatives, so he tried his hand at the mandolin, taught himself to sight-read, and formed a trio with a singer and a violinist. They performed sentimental songs such as, "Good bye, Good bye, God Bless You," yet Hugh showed only mediocre tal-



## THE HUNT FOR INCOME, AS WELL AS THE CHANGE OF ADDRESS, COINCIDED WITH HIS ATTRACTION TO A BRIGHT YOUNG WOMAN

ent as a performer. Similarly, although he attended occasional intramural sporting events, he lacked athletic ability himself. But he did make strides in his personal presentation. He began to wear suits, neckties, dark topcoats, and rounded flat caps or bowler hats. While not obviously handsome or notably tall, his well-groomed appearance and reserved demeanor suggested maturity, an image he cultivated in order to compensate for receiving his college diploma at the age of eighteen.<sup>25</sup>

The year before he earned his degree, Dryden moved out of his parents' home on North Milton and rented a room at 2305 Adams Street in Baltimore. Now in need of money, he tutored a fellow undergraduate in calculus, applied to the Baltimore Board of Education to be a mathematics teacher for the 1915 summer session, and considered temporary work as a draftsman for the New York Central Railroad—at \$100 to \$110 per month, “all pie,” wrote a friend.<sup>26</sup>

The hunt for income, as well as the change of address, coincided with his attraction to a bright young woman named Mary Libbie Travers, the daughter of Ida Eugenia and Frank Travers, also of Baltimore. Just five-feet one-inch tall, her slender figure, alluring dark hair, and lively hazel eyes won his attention. She brought joy and charm to his life. And the young pair shared a common Maryland background. Her parents' family originated in Snow Hill, the prosperous seat of Worcester County, up river from the humbler Pocomoke City. Her people, like his, relished music; Mrs. Travers possessed a

beautiful singing voice and Libbie played both piano and organ.

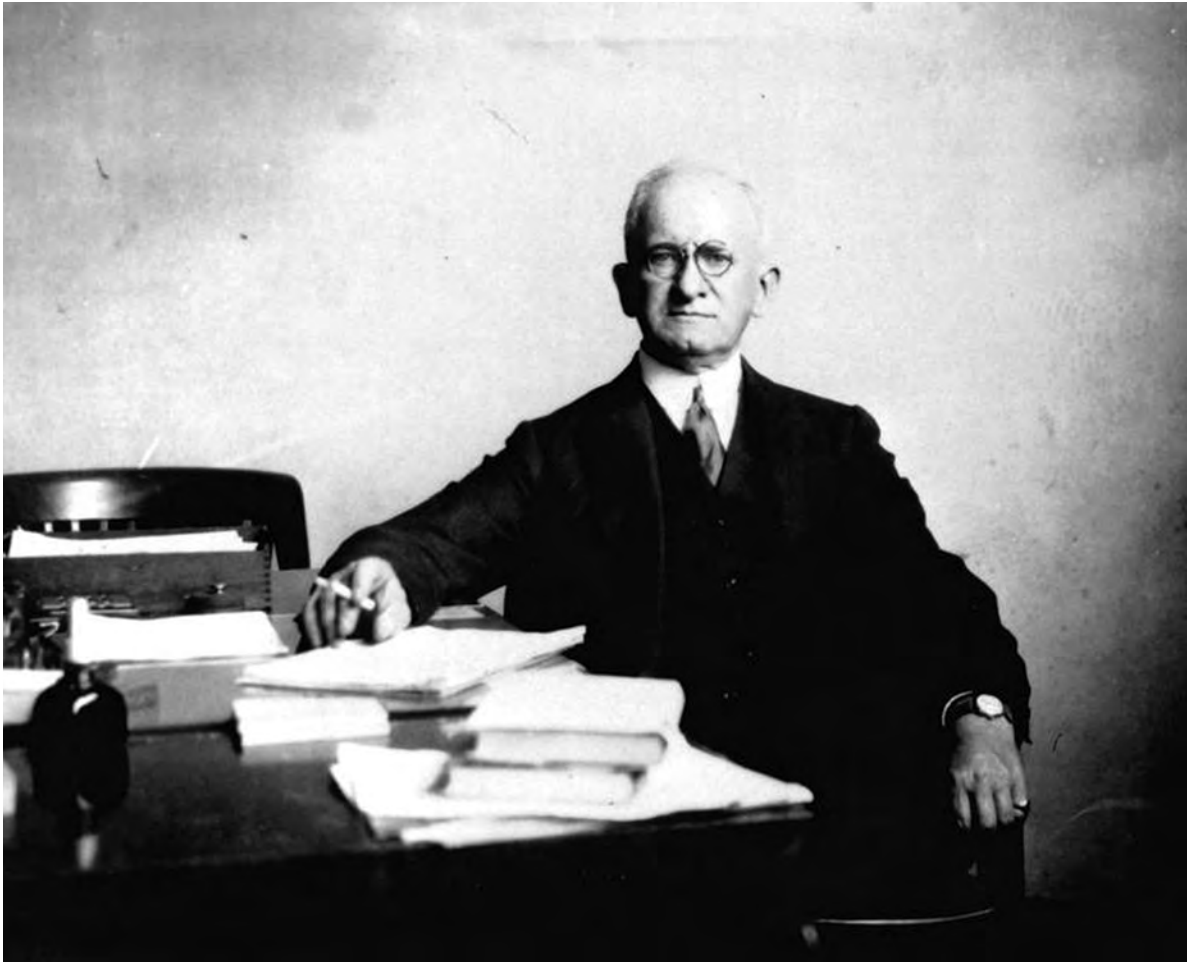
Soon, Dryden could not resist her. Not accidentally, it took only minutes to walk from the house where he roomed to the Travers residence on 2110 East Biddle Street. Frank and Ida Travers began to notice with amusement the frequency of his visits to their home. They smiled because on arrival he often claimed that he had walked down their street to inquire about a baby just born to the nearby Bowen family. They knew that his real interest lived under their roof.

### A Life of Prayer

Hugh and Libbie's affinity for one another rested in part on attraction and common family origins, but it had almost nothing to do with shared intellectual interests. A person of practical sense, Libbie had a poor grasp of Hugh's scientific passions, nor did they concern her. He once tried to entice her to apply for a stenographer's position at Goucher College in Baltimore, hoping that she could work and study at the same time. But nothing came of it. However, if the pursuit of knowledge failed to unite them, their shared religious experience certainly did. Both the Dryden and Travers families attended the Appold Methodist Church in Baltimore and there the youngsters met one Sunday, she at age twelve, he at eleven. The weekly encounters that followed gave them the opportunity to become familiar with each other and to mature in the same tradition.<sup>27</sup>



Joseph S. Ames, Dryden's teacher and mentor.



HUGH  
DRYDEN AND  
LIBBIE  
TRAVERS  
ABSORBED  
THE  
IDEALISM  
AND  
OPTIMISM  
INHERENT IN  
THESE  
EXPRES-  
SIONS OF  
SOCIAL  
JUSTICE

The Methodism that they embraced early in the twentieth century had the power to inspire and persuade. Its founding moment occurred in 1738 when Anglican clergyman John Wesley, attending an evening prayer meeting in London, underwent a profound spiritual re-awakening while listening to a speaker interpret Martin Luther's preface to St. Paul's Letter to the Romans: <sup>28</sup>

*While he was describing the change which God works in the heart through faith in Christ, I felt my heart strangely warmed. I felt I had trust in Christ, Christ alone for my salvation; and an assurance was given me that He had taken away my sins, even mine, and saved me from the law of sin and of death.*

From that time on, Wesley abandoned the more formalistic teachings of Anglicanism and based his belief on a direct and personal relationship with God. This simple faith drove him and his younger brother Charles to action. They established Methodism first in England and then in America, propagating the intense experience of divine re-birth, as well as a daily engagement with "activity, honesty, frugality, and charity in the Christian life."

Most of the congregants of the Appold Methodist Church accepted not only the fundamental tenets of the Wesleys, but an amalgam of the sacred assumptions of their own day. During the period before World War I, a doctrine known as the

Social Gospel, and a companion teaching called Liberal Theology, held sway in Protestant America. The Social Gospel offered an answer to the nineteenth century challenges that capitalism and Marxism posed to conventional religion. It envisioned a radical reconstruction of society based on the unfolding of the Kingdom of God on Earth. Liberal Theology—a more practical proposition—moved Christians to combat societal evils forcefully, with the assurance that God intercedes in human affairs and guides history towards progress and improvement. Hugh Dryden and Libbie Travers absorbed the idealism and optimism inherent in these expressions of social justice, and merged them with the Wesleyan vision of personal salvation and a firm moral code. <sup>29</sup>

For his own part, Hugh seems to have felt an intense religious calling at an early age. He wrote at twelve years old about aspects of character conducive to a person of faith, pinpointing a good temper, a kind disposition, and a respectful manner. "Lastly," he said, "truthfulness is perhaps the best trait." <sup>30</sup> About two years later he pledged his name to a group known as the Lincoln Legion, a branch of the Anti-Saloon League dedicated to enlisting children in the temperance cause. As a member, Dryden promised, "with God's help," to "abstain from the use of intoxicating liquors as a beverage" (a vow that he kept his entire life). <sup>31</sup> Even more telling, at age fourteen he actually submitted an application to study



Hugh Dryden early in his career, after he left Johns Hopkins.

**IN A CLASS-  
ROOM FULL  
OF BRIGHT  
MINDS, THE  
TEENAGER  
FROM  
SOUTHERN  
MARYLAND  
STOOD OUT**

for the Methodist clergy. Only when he discovered that the seminary of his choice did not accept teenage boys did he decide to fulfill his prodigious mathematical promise, finish his studies at Baltimore City College, and enroll at a secular university.<sup>32</sup>

Even as he attended Johns Hopkins, however, Dryden held fast to his faith. He found an outlet for his passion at Idlewylde Methodist Church, a new but tiny house of worship on Register Avenue in the suburbs of Baltimore. In addition to taking a full schedule of courses and to pursuing his relationship with Libbie, he studied for a lay preacher's license and became a summertime student pastor at Idlewylde. His income helped to defray some of his personal expenses, but more importantly, it led to his selection as a visiting preacher at the Lovely Lane Methodist Church at 2200 St. Paul Street, within walking distance of the Hopkins campus. His assignment there really meant something. A big congregation dating to 1772, Lovely Lane considered itself the mother church of American Methodism, and his appointment suggests a flair for the pulpit.

Despite his increasing responsibilities, Dryden continued to expand his devotional activities. He

attended the meetings of the Young Men's Christian Association, which at the invitation of Hopkins' first president Daniel Coit Gilman conducted a ministry for undergraduates; contributed money to a group known as the Home Defenders Association for a Dry Baltimore; took part, as an usher, in one of the Reverend Billy Sunday's crusades; and became associated with the Methodist Hospital Association (that operated the Maryland General Hospital in Baltimore).

Among Dryden's many religious ventures, one proved to have a decisive personal impact. It involved his term as local president of the Epworth League, a chapter of a national group devoted to cultivating Methodism among young adults. His duties there led unexpectedly to a deepening of his relationship with Libbie Travers, who became the League's fourth vice president at the time Hugh assumed office. Her role required her to organize programs and to supply food for the meetings. On one occasion, she prepared a dinner for the entire membership, and Hugh found himself deeply impressed by the skill and grace with which she carried out her task. Although he learned later that she had received considerable help from another woman, his impression lingered; he now saw in Libbie not just someone whom he admired and who shared his Christian outlook, but a person with the nurturing qualities that he hoped for in a wife and mother.<sup>33</sup>

\* \* \*

Meanwhile, another pivotal figure entered his life, one who affirmed by example that Hugh did not have to choose between the secular and the spiritual, but could aspire to both. Like most undergraduates, his initial aspirations changed under the influence of friends, coursework, and teachers. He entered the university intent on studying mathematics, and although he eventually took his Bachelor's degree in it, by his sophomore year he had become intrigued by physics. His interest originated with some photoelectric experiments that he witnessed in a class offered by Professor Joseph S. Ames, a distinguished figure in Johns Hopkins history. When Dryden met him, the 50 year-old Ames stood at the pinnacle of his profession. He had devoted his entire adult life to the school, took all of his degrees there, published extensively, and climbed the academic ladder from professor, to physics department chair, to director of the Hopkins Physical Laboratory, and ultimately, to president of the university.

Dryden started graduate school and became one of Ames' students in 1916, at eighteen years of age. In doing so he apprenticed himself to a man at once decent, difficult, and misunderstood; a person of exceptional contradictions. Ames' complexity may have been rooted in a persistent stammer that started in childhood and followed him into adulthood. Although he gradually mastered it, it left a mark on his habits and personality. In order to avoid words that triggered his condition, he spoke



tersely and to the point, leading many to consider him blunt, insensitive, and even rude. Yet Ames treated his students considerately and worked to promote their advancement, especially those in whom he saw capability and determination—his own traits, according to a colleague.

At first, Dryden found an intellectual kinship with Ames; but in time, their common religious instincts brought them closer together. A lifelong Episcopalian, Ames served on the Standing Committee of the Protestant Episcopal Diocese of Maryland and he also sat on the Council of the Washington National Cathedral (the massive flagship building of the U.S. Episcopal Church, then in the early stages of its 83-year construction). Moreover, raised by an Episcopal priest (his mother's second husband) and educated at a school where his stepfather presided as rector, he appreciated students with a devotion to Christianity. For

Hugh's part, Ames represented what he hoped to be; a person capable of embracing science and faith.

Once this almost filial relationship took shape, Dryden stayed dutifully on the path paved by his mentor, and Ames took a keen interest in his progress. In a classroom full of bright minds, the teenager from Southern Maryland stood out, for in spite of his age, Ames found him to be able, mature, and industrious—indeed, “the brightest young man [I] had ever had, without exception.”<sup>34</sup>

Had the two met just a little earlier, a more conventional career in university teaching or research might have awaited Dryden. But around this time, events occurring in Washington, D.C. opened a new chapter in Ames' life, and with it, a new chapter in Hugh Dryden's as well. ■

*This article honors my beloved sister-in-law, Maureen Marie Bachem, 1947-2015.*

## NOTES

I would like to thank NASA archivist Colin Fries for his assistance in the preparation of this article.

*All documents identified with the words, “copy (or copies) in the author's possession” originated with the Dryden family.*

1. The top line of this article is quoted in Richard K. Smith, *The Hugh L. Dryden Papers, 1898-1965: A Preliminary Catalog of the Basic Collection* (Baltimore, Maryland: Johns Hopkins University, 1974), p. 19; Alan Brown and David Weaver, “NASA Honors Astronaut Neil Armstrong with Center Renaming,” NASA News Release, Feb. 28, 2014; “Center Naming Honors Neil Armstrong, Hugh Dryden,” posted on YouTube May 13, 2014; author's recollection of meetings held in 2006 at the Dryden Flight Research Center (DFRC), in which the deputy center director initiated the process of redesignating DFRC as the Neil A. Armstrong Flight Research Center, an ambition realized finally in 2014; for a general discussion of Hugh Dryden's life and career see Michael H. Gorn, “Who Was Hugh Dryden and Why Should We Care?” in *Realizing the Dream of Flight: Biographical Essays in Honor of the Centennial of Flight*, ed. Virginia P. Dawson and Mark D. Bowles (Washington, D.C.: NASA History Division, 2005), 163-184; see also, Michael H. Gorn, *Hugh Dryden's Career in Aviation and Space*, Monographs in Aerospace History Number 5 (Washington, D.C.: NASA History Division, 1996), pp. 1-20.

2. Gorn, “Who was Hugh Dryden and Why Should We Care?”, pp. 163-184; Gorn, *Hugh Dryden's Career in Aviation and Space*, pp. 1-20; Hugh L. Dryden, Jr., interview by author, Sep. 19, 1994, Deerfield, Illinois, Sep. 19, 1994, tape recording in the author's possession.

3. Some of the Scottish Drydens settled on the English side of the border. These Northamptonshire folk became the largest cohort of the family in England. Leslie Powell Dryden, *Dryden Family and Descendants, Book I* (San Diego: Ruth T. Dryden, 1992), p. 1.

4. *Ibid.*, pp. 1-11.

5. *Ibid.*, pp. 11-12.

6. *Ibid.*, pp. 11-12.

7. *Ibid.*, p. 12.

8. *Ibid.*, pp. 12-16.

9. *Ibid.*, pp. 163, 242-243, 338.

10. *Ibid.*, pp. 338-339; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994, Rockville, Maryland, tape recording in the author's possession; Mary Ruth (Dryden) Van Tuyl, interview by author, Aug. 3, 1994, Silver Spring, Maryland, tape recording in the author's possession; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, Hugh L. Dryden Collection, Ms. 147, Series 2.2, Milton S. Eisenhower Library, Johns Hopkins University, Baltimore, Maryland (referred to hereafter as HLD Collection, JHU, followed by ms. file numbers); Steven M. Mister, “He Grew Up with the Airplane,” Pocomoke City High School Term Paper, 1982, Historical Reference Collection, folder #002997, Headquarters National Aeronautics and Space Administration, Washington, D.C., (referred to hereafter as HQ NASA HRC, followed by a file folder number); biographical sketches of Samuel I. and Edgar F. Dryden by Leslie Dryden, mounted in a Dryden family photo album, copy in the author's possession. Also in the same photo album: obituaries of Samuel Dryden (no dates, newspapers unidentified); Vincent Hearne to the Trustees of the Inindocna School, no date; and H.J. Handy to whom it may concern, Jul. 25, 1895 (quotations excerpted from the Hearne letter).

11. In the same photo album referenced in note 10: Obituary of Zenobia Dryden (no date, newspaper unidentified); Biographical sketch of Zenobia Dryden by Leslie Dryden; Photograph of the Perryhawkin School Class, spring 1895; Nancy (Dryden) Baker, interview by author, 9 August 1994; Dryden, Descendants, Book I, p. 338.

12. After Rev. Elderdice left Pocomoke city he became President of the Methodist Westminster Theological seminary in Baltimore from 1897 until his retirement in 1932. Elderdice assumed both regional and national leadership in church affairs, serving as Secretary of the Maryland Methodist Conference for five years, and as Secretary of the General (U.S.) Conference for four years. New York Times, May 13, 1938; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2; Smith, Hugh L. Dryden Papers, p. 19; observations based on the author's visit to Pocomoke City, Maryland, Oct. 12, 1995.

13. Delsie Pusey to Hugh L. Dryden, Jun. 29, 1958, HLD Collection, JHU, Ms. 147, Series 2.30 (quotation about Hugh and Raymond). Neither of Hugh Dryden's daughters recall their father ever speaking about his own father, but he often visited his mother, around whom he behaved with quiet affection. Nancy (Dryden) Baker, interview by author, by telephone, Dec. 4, 1995, transcription in the author's possession; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994; Mary Ruth (Dryden) Van Tuyl, interview by author, Aug. 3, 1994; Hugh L. Dryden, Jr. to Michael H. Gorn, Sep. 21, 1994, copy in the author's possession; Shirley Thomas, *Men of Space*, vol. 2 (Philadelphia: Chilton, 1960-1968), p. 65; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2; Mister, "He Grew Up with the Airplane," HQ NASA HRC, folder 002997; Michael Crawford Keenan, "Hugh Latimer Dryden, (1908-1965): NASA's Chief Scientist and Methodist Lay Preacher" (Master's Thesis, University of Maryland, 1995), p. 2; Dryden, Descendants, Book I, pp. 338-339, 409; Ralph Reppert, "Hugh L. Dryden: Aeronautics' Man of Tomorrow," *The Baltimore Sun Magazine*, Jan. 21 1951, p. 10; Hugh L. Dryden, Personnel History Statement, May 28, 1947, HLD Collection, JHU, Ms. 147, Series 2.2.
14. Gorn, *Hugh L. Dryden's Career in Aviation and Space*, p. 1; Nancy (Dryden) Baker, interview by author, Dec. 4, 1995; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994; Hugh L. Dryden, Jr., interview by author, Sep. 19, 1994; Dryden, Descendants, Book I, p. 409; Keenan, "Hugh L. Dryden," p. 2; Thomas, *Men of Space*, vol. 2, p. 65; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2; Reppert, "Man of Tomorrow," p. 10.
15. Dryden, Descendants, Book I, p. 338; Nancy (Dryden) Baker, interview by author, Dec. 4, 1995; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994; a map of 1040 North Milton Avenue and the surrounding Baltimore neighborhoods is on the Walk Score internet site, available at [www.walkscore.com/score/1040-n-milton-ave-baltimore-md-21205](http://www.walkscore.com/score/1040-n-milton-ave-baltimore-md-21205).
16. Leslie Dryden was born on Christmas Day, 1914: Dryden, Descendants, Book I, pp. 338, 409; Thomas, *Men of Space*, vol. 2, p. 66 (Dryden's quotation about newspaper boys); Mary Ruth (Dryden) Van Tuyl, interview by author, Aug. 3, 1994; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994; Nancy (Dryden) Baker, interview by author, by telephone, Jul. 25, 1994, transcription in the author's possession; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2. In the same photo album referenced in note 10: photograph of the Culver cousins about 1910 in Somerset County, Maryland; photograph of Hugh and Raymond Dryden at the Eastern Shore in 1908; photograph of Hugh Dryden's class in School Number 52 in Baltimore; biographical Sketch of Samuel I. Dryden; photograph of Samuel I. Dryden as streetcar conductor in 1908 or 1909; photograph of the Dryden family about 1910; Reppert, "Man of Tomorrow," p. 10.
17. Hugh L. Dryden, "The Fairyland of California," school essay, Apr. 15, 1908, HLD Collection, JHU, Ms. 147, Series 1.1. See also the following school essays by Dryden in the same part of the HLD Collection, JHU: "Indian Corn and the Corn Belt," Feb. 3, 1908; "Robert Fulton and the Steamboat," Mar. 3, 1908; "Life in the Timber Regions," Mar. 4, 1908; "The Wonders and Treasures of the Rocky Mountain Region," Mar. 11, 1908; "A Visit to a Gold Mine," Mar. 18, 1908; "Eli Whitney," Mar. 20, 1908; "San Francisco and the Chinese," 1 May 1908; "Our National Capital," May 15, 1908; "Baltimore Oriole," May 21, 1908; "A Visit to the President and to the Halls of Congress," May 22, 1908; "The Departments of the Government," May 28, 1908; "Baltimore and Our Oyster Beds," Jun. 5, 1908; "In Philadelphia: A Visit to the Mint," Jun. 11, 1908; "John C. Fremont and Kit Carson," Jun. 17, 1908; "Review of Hawthorne Works," Oct. 29, 1909; "Science," Feb. 22, 1910.
18. Collected Spelling Tests, May 4, 1908-Jun. 19, 1908, HLD Collection, JHU, Ms. 147, Series 1.1; Collected Arithmetic Tests, Mar. 5, 1908-Jun. 10, 1908, HLD Collection, JHU, Ms. 147, Series 1.1; Louis Klopsch, comp., *Many Thoughts of Many Minds: A Treasury of Quotations from the Literature of Every Land and Every Age* (New York: The Christian Herald, 1896), 3 (Dryden's inscription) and 135 (Taylor's quotation) (copy in the author's possession).
19. Tom D. Crouch, *A Dream of Wings: Americans and the Airplane, 1975-1905* (Washington and London: Smithsonian Institution Press, 1989), p. 27 (Cayley quotation); see also in Crouch pp. 20-41, 61-77, 175-202, 223-254, 284-305.
20. Joseph J. Corn, *The Winged Gospel: America's Romance with Aviation, 1900-1950* (New York and Oxford: Oxford University Press, 1983), pp. 7-9; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2; Smith, Hugh L. Dryden Papers, pp. 19-20; Thomas, *Men of Space*, vol. 2, p. 66; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994; Hugh L. Dryden, "The Advantages of the Airship Over the Aeroplane," school essay, Nov. 11, 1910, HLD Collection, JHU, Ms. 147, Series 1.1; Eugene M. Emme, "Astronautical Biography: Hugh Latimer Dryden, 1898-1965," *The Journal of the Astronautical Sciences* 25 (April- June 1977): pp. 152-153.
21. Map of 1040 North Milton Ave. and surrounding neighborhoods, available on the Walk Score website (see note 15); Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2; Hugh L. Dryden, Autobiographical Sketch, Sep. 15, 1962, HLD Collection, JHU, Ms. 147, Series 2.2; Keenan, "Hugh L. Dryden," p. 2; Mary Ruth (Dryden) Van Tuyl, interview by author, Aug. 3, 1994; Nancy (Dryden) Baker, interview by author, Jul. 25, 1994; Hugh L. Dryden, "An Evening Spent Alone in an Old House," school essay, Sep. 30, 1910, HLD Collection, JHU, Ms. 147, Series 1.1. See also the following essays by Dryden in the same part of the HLD Collection, JHU: "My Hero in Fiction," Oct. 14, 1910; "A True Halloween Party," Oct. 28, 1910; "How to Set Up A Tent," Dec. 9, 1910; "A Winter Scene," Jan. 9, 1911; "Resolved, that a college should be located in a small town not in a large city," Jan. 20, 1911; "Evil is wrought by the want of thought as well as by want of heart," May 19, 1911; "Resolved, That moving picture parlors of illustration should displace the (common, everyday) moving-picture parlor," Jun. 2, 1911; "How the Debt was Paid," Sep. 29, 1911; "German Exercise," Oct. 11, 1911; "The Veal Butcher's Stall," Oct. 27, 1911; "Samuel Johnson and David Garrick," Dec. 8, 1911; "How to do your Christmas Shopping," Dec. 22, 1911; "A High School Paper," Mar. 1, 1912; "A Railroad Accident," Mar. 15, 1912; "Time flies over us, but leaves its shadow behind—Hawthorne," Apr. 26, 1912; "Brutus was Justified in Killing Caesar," May 10, 1912; "The Greatest Obstacles to World's Peace," May 24, 1912; "Botany," Mar. 27, 1913. See also Hugh L. Dryden, "The Stage in Shakespeare's Time," school essay, Apr. 12,



1912 and Glen Owens to Hugh L. Dryden, Aug. 22, 1911, copies of both in the author's possession; Rev. Charles Kingsley, *Hereward: The Last of the English* (New York: A.L. Burt Publishers, 1902), (the title page is inscribed by Dryden, who lists Hereward as book No. 24 in the "Hugh Dryden Library"), copy in the author's possession.

22. Thomas, *Men of Space*, vol.2, p. 67 (quotation from an envious classmate), and see also p. 65; Glenn Owens to Hugh L. Dryden, Jun. 7, 1913 (quotation from a sympathetic classmate), copy in the author's possession; Gorn, *Hugh L. Dryden's Career in Aviation and Space*, pp. 1-2; Keenan, "Hugh L. Dryden," p. 2; Reppert, "Man of Tomorrow," p. 10; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2; "Honor Man at City College," photo in Hugh L. Dryden biographical collection, file number CD 659000-40, National Air and Space Museum Archives, Washington, D.C. (referred to hereafter as NASM Archives). In the same photo album referenced in note 10: graduation photo (with caption) of Hugh L. Dryden from Baltimore City College, clipped from *Leslie's Illustrated Weekly Newspaper*, Jul. 10, 1913.

23. Richard H. Uhrbrock to the Board Awarding Maryland Scholarships, Jun. 3, 1913 (quotation from Uhrbrock's letter of reference), copy in the author's possession; S.F. Norris to Hugh L. Dryden, Jun. 17, 1913, copy in the author's possession.

24. L.S. Hurlburt to Hugh L. Dryden Jun. 15, 1913, copy in the author's possession; Hugh L. Dryden, Autobiographical Sketch, Sep. 27, 1965, HLD Collection, JHU, Ms. 147, Series 2.2; Hugh L. Dryden, handwritten biographical statement, no date, HLD Collection, JHU, Ms. 147, Series 2.2; Hugh L. Dryden, Personal History Statement for Federal Employment, May 28, 1947, HLD Collection, JHU, Ms. 147, Series 2.2.

25. Hugh L. Dryden, Biographical Information for Current Biography, HQ NASA HRC, folder 002997; Hugh L. Dryden's College Schoolbooks, copies in the author's possession; Reppert, "Man of Tomorrow," p. 10.

26. Nancy (Dryden) Baker, interview by author, by telephone, Dec. 4, 1996, transcription in the author's possession; Nancy (Dryden) Baker, interview by author, by telephone, Feb. 7, 1996, transcription in the author's possession; Hugh L. Dryden, Personal History Statement for Federal Employment, May 28, 1947, HLD Collection, JHU, Ms. 147, Series 2.2; James Van Hulstyn to Hugh L. Dryden, Jan. 5, 1916, copy in the author's possession; Hugh L. Dryden to the Board of Superintendents of Public Education of Baltimore City, no date, copy in the author's possession; Arthur F. Gorton to Hugh L. Dryden, Aug. 9, 1915, copy in the author's possession; E.L. Painter to Hugh L. Dryden, no date, copy in the author's possession.

27. Dryden's younger daughter Nancy reports that he left the North Milton Avenue home in 1915 because his parents moved back for a time to the Eastern Shore in Maryland. See Nancy (Dryden) Baker, interview by author, Feb. 7, 1996; photos of Mary Libbie Travers in the album referenced in note 10; Descendants, Book I, 408; Mary Libbie Dryden, Department of State Passport Application, Jun. 27, 1952, HLD Collection, JHU, Ms. 147, Series 2.30; Hugh L. Dryden, Personal History Statement for Federal Employment, May 28, 1947, HLD Collection, JHU, Ms. 147, Series 2.2; Hugh L. Dryden to William Guth, Aug. 21, 1916, copy in the author's possession; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994; Nancy (Dryden) Baker, interviews by author, by telephone, Jun. 17, 25 July, Aug. 10, 1994, Dec. 4, 1995, and Jul. 25, 1996, all transcriptions

in the author's possession; Hugh L. Dryden, Jr., interview by author, by telephone, Dec. 4, 1995, transcription in the author's possession.

28. John Dillenberger and Claude Welch, *Protestant Christianity Interpreted Through its Development* (New York: Macmillan; London: Collier Macmillan, 1988), p. 117 (quotation of John Wesley).

29. Dillenberger and Welch, *Protestant Christianity*, pp. 117, 221-222; Keenan, "Hugh L. Dryden" pp. 41-64.

30. Hugh L. Dryden, "Admirable Traits of Character," school essay, Jan. 19, 1911, HLD Collection, JHU, Ms. 147, Series 1.1; Nancy (Dryden) Baker, interview by author, Jun. 17, 1994.

31. Hugh L. Dryden, Pledge card for the Lincoln Legion signed by Dryden, Mar. 3, 1912, copy in the author's possession.

32. Hugh L. Dryden, Jr., interview by author, by telephone, Sep. 4, 1994, transcription in the author's possession; Mary Ruth (Dryden) Van Tuyl, interview by author, Aug. 3, 1994; Nancy (Dryden) Baker, interviews by author, Jun. 17, 1994, Aug. 9 1994, Dec. 4, 1995, and Aug. 9, 1994.

33. Nancy (Dryden) Baker, interview by author, Dec. 4, 1995; Connie Henning of the Idlewyde Methodist Church, interview by author, by telephone, Dec. 4, 1995, transcription in the possession of the author; Caretaker at the First (formerly Lovely Lane) Methodist Church in Baltimore, interview by author, by telephone, Jun. 11, 1996, transcription in the author's possession; Keenan, "Hugh L. Dryden," pp. 5, 42, 65-66; Hugh L. Dryden, Biographical Information for Current Biography, HQ NASA HRC, folder 002997; invitation by the John Hopkins University Young Men's Christian Association to Hugh Dryden, Oct. 10, 1913, copy in the author's possession; Steven M. Mister, "He Grew Up with the Airplane," Pocomoke High School term paper, 1982, HQ NASA HRC, folder 002997; Henry A. Griesemer (?) to friends and co-workers of the Home Defenders Association for a Dry Baltimore, Jul. 14, 1916, copy in the author's possession; receipt of a donation by Hugh L. Dryden to the Home Defenders Association for a Dry Baltimore, Sep. 19, 1916, copy in the author's possession; W.C. Scott, President of the Methodist Hospital Association to Hugh L. Dryden, Sep. 2, 1916, copy in the author's possession.

34. N. Ernest Dorsey, "Joseph Sweetman Ames: The Man," *American Journal of Physics* 12 (1944): 135-148; Henry Crew, "Joseph Sweetman Ames, 1964-1943," *Biographical Memoirs of the National Academy of Sciences* 23 (1944): pp. 181-210; Hugh L. Dryden, interview by Donald Shaugnessy, Feb. 3, 1960, 1 (American Heritage Columbia University Oral Interview Series), copy in the Air Force Historical Research Agency Archives, Maxwell Air Force Base, Alabama, microfilm #K146.34-41; *Who's Who in Aviation, 1942-1943*, s.v. "Joseph Sweetman Ames"; Alex Roland, *Model Research: The National Advisory Committee for Aeronautics, 1915-1958*, vol. 1 (Washington, D.C.: NASA History Division, 1985), p. 41; Joseph S. Ames, Special Passport, Jun. 4, 1930, HQ NASA HRC, folder 000068; Nancy (Dryden) Baker, interview by author, Aug. 9, 1994; Gorn, *Hugh L. Dryden's Career in Aviation and Space*, p. 2; in the photo album referenced in note 10: graduation photo (with caption) of Hugh L. Dryden from Baltimore City College, clipped from *Leslie's Illustrated Weekly Newspaper*, Jul. 10, 1913; Keenan, "Hugh L. Dryden," p. 3; Hugh L. Dryden, Biographical Information for Current Biography, HQ NASA HRC, folder 002997; Smith, *Hugh L. Dryden Papers*, p. 20 (quotation by Ames).

# FERRET: EVOLUTION C





# OF A DESIGN CONCEPT



Bill Cahill

(Overleaf) B-17F Ferret 42-3055/Ferret V exhibiting an interesting mottled night camouflage scheme while parked at a Mediterranean airfield. Unlike her sisters Ferrets III and IV, Ferret V stayed with the unit throughout its operations in the Mediterranean.

## TO DEVELOP RADIO AND RADAR RECEIVERS, INITIALLY THE USAAF RELIED UPON THE ARMY SIGNAL CORPS

The United States Army Air Forces (USAAF) came into its own in the Second World War, refining airpower doctrine and growing a global strategic air force. Out of this war emerged the blueprint for how the soon-to-be United States Air Force (USAF) would conduct itself for the ensuing 40 odd years of the Cold War. Critical to this fight was the murky world of signals intelligence (SIGINT) and its two components – electronic intelligence (ELINT) and communications intelligence (COMINT). USAAF work in this field set the stage for Strategic Air Command's Cold War reconnaissance campaign around the perimeter of the Soviet Union. Key to the success of SIGINT in the Second World War was the ability to develop, modify and produce specialized aircraft for this critical airborne mission. The aircraft that these intrepid airmen created were referred to as ferrets.

### The Beginnings

By mid 1942 the tide of the Second World War was slowly turning in favor of the Allies. Nazi Germany was stalled outside of Stalingrad and turned back from Egypt at El Alamein while the U.S. Navy inflicted a stunning defeat on the Imperial Japanese Navy at Midway. In October of that year, the USAAF flew its first ELINT mission utilizing a modified Boeing B-17E bomber assigned to the 11th Bombardment Group. Spurred by the discovery of an Imperial Japanese Navy radar by U.S. forces liberating Guadalcanal, the purpose of this new mission was to identify any Japanese radars still operating in the Solomon Islands. Engineers from the Naval Research Laboratory operated a hand-built XARD radar receiver aboard the bomber for a limited number of missions, none of which picked up any Japanese signals.<sup>1</sup> This initial lack of success, however, did not deter the USAAF as they continued to push ahead in their quest to intercept radar signals.

To develop radio and radar receivers, initially the USAAF relied upon the Army Signal Corps. Long since tasked with the development of Army radios and radar systems, the Signal Corps had the expertise and facilities such as the Aircraft Radio Laboratory at Wright Field, Ohio to support such an endeavor. The Office of the Chief Signal Officer in Washington coordinated with the Air Staff to ensure that these airborne receivers were developed to meet the USAAF's specific requirements.<sup>2</sup>

Airborne SIGINT receivers provided many benefits over their terrestrial brethren. From their operating altitude, they had better reception of enemy signals and were not as affected by terrain. They could also operate closer to enemy signals, a

great benefit in the Pacific where broad expanses of water often intervened between front lines. Finally, due to the fact that they were on a moving platform, geo-location of the enemy signal was faster due to the fact that multiple 'cuts' or lines of bearing could be taken in a relatively short period of time. Airborne receiver design was basically the same as their terrestrial peers, though consideration had to be made for lightness in construction as well as hardening the design to account for the jarring of aircraft operations.

One month after the unproductive effort in the Southwest Pacific, an Eleventh Air Force photo reconnaissance mission in the Aleutians revealed a probable Japanese radar installation on the island of Kiska. The race was on once again. A collaborative effort between the Air Staff in Washington and the Aircraft Radio Laboratory in Ohio resulted in a formal requirement approved by USAAF Chief of Staff General Henry "Hap" Arnold. This project, code-named "Ferret", called for the Aircraft Radio Laboratory to team with the Naval Research Laboratory in outfitting a new Consolidated B-24D Liberator bomber with a suite of military and commercial radio receivers for the ELINT mission. The modified B-24, named Ferret I (AAF Serial 41-23941 – see Table 1), deployed to Adak, Alaska in February 1943. After weeks of weather delays, Ferret I flew its first operational mission over the Aleutians on March 6. The radar receivers' two operators, dubbed "Radar Observer, Radar Countermeasure" by the USAAF, soon started receiving signals from two Japanese radar sets located on enemy-held Kiska Island. After completing two additional missions to map out their locations and operating parameters, Ferret I returned to Wright Field.<sup>3</sup> Ferret I's deployment was a success by not only finding the targeted Japanese radars, but also by proving the concept of an airborne SIGINT platform.

In order to locate radars, a modified bomber needed to be able to do two major tasks: 1) intercept a radar transmission and determine its bearing relative to the aircraft and 2) determine the aircraft position. Both tasks required a high degree of accuracy. With known aircraft positions and two or more accurate bearings taken from different positions, the enemy radar location could be determined by plotting the intersection of the lines of bearing. These basic requirements – accurate direction finding and accurate navigation – drove the ferret's design. In addition to determining the location of the radar, the radar signal itself needed to be analyzed by the Radar Observers. A ferret aircraft carried signal analyzers and panoramic scopes to enable careful analysis of the radar pulse. Radio

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



FERRET I'S DEPLOYMENT WAS A SUCCESS BY NOT ONLY FINDING THE TARGETED JAPANESE RADARS, BUT ALSO BY PROVING THE CONCEPT

THE ACTUAL EQUIPMENT EVOLVED THROUGHOUT THE WAR AS ENEMY EQUIPMENT CHANGED AND MORE WAS LEARNED ABOUT THE SIGINT BUSINESS

Table 1 - Known Production Ferret Aircraft

Ferret Number	Aircraft Type	Serial Number	Project Number	Enter Mod Line	Arrive Eglin Field	Unit Assignments	Notes
I	B-24D-10-CO	41-23941				11 <sup>th</sup> AF?	"Little Buck" nose art?
II	Unk	Unk	Unk				
III	B-17F-50-DL	42-29644				16th RS; replaced by 42-2358 ~ 1 Nov 43 and returned to the ZI on 9 Nov 43.	"Archangel" nose art
IV	B-17F-75-BO	42-29881	92144R?			16th RS; replaced by 42-30379 and returned to the ZI early Nov 43	
V	B-17F-20-DL	42-3055				16 <sup>th</sup> RS	"The Pointer" nose art
VI (Original XI)	B-24J-195-CO	44-41124	96508R	16 Jul 44	28 Oct 44	3 <sup>rd</sup> PRS Jun – Aug 45	
VII	B-24D-20-CF	42-63991				Section 22; flew with 43 BG and 308 BG; Jan 44 – Feb 45	"Duchess of Paducah" nose art
VIII	B-24D-20-CF	42-64045			23 Sep 43	Section 22; flew with 43 BG and 308 BG; Jan – Dec 44	"Atom Smasher" nose art
IX	B-24D?	Unk		Jan 44?	Unk		
X	B-24J-195-CO	44-41076	96508R	17 Jul 44	26 Oct 44	Section 22 – Feb-May 45; 20 CMS July-Aug 45	
XI (#2)	B-24J-185-CO	44-40943	96508R	23 Aug 44	24 Jan 45	Section 22 – Apr-May 45; 20 CMS July-Aug 45	
XII	B-24J-180-CO	44-40815	90754S?	3 Jun 44	30 Jul 44	7 BG/10 AF– Late 44 - May 45; 20 CMS July-Aug 45	"Alec-Tronix" nose art
XIII	B-24J-180-CO	44-40817	90754S?	3 Jun 44	30 Jul 44	308 BG/14 AF– Late 44-May 45; 20 CMS July-Aug 45	"Rovin' Lady" nose art
XIV	B-24M-10-CO	44-41981	96978S	1 Jan 45	26 Jan 45	3 <sup>rd</sup> PRS May– Aug 45	
XV	B-24M-10-CO	44-41985	96978S	2 Jan 45	25 Jan 45	3 <sup>rd</sup> PRS; written off in training accident, Mar 45	
XVI	B-24M-10-CO	44-41994	96978S	2 Jan 45	25 Jan 45	3 <sup>rd</sup> PRS May– Aug 45	
XVII	B-24M-10-CO	44-41995	96978S	4 Jan 45	11 Mar 45	March Field, RCM Training; lost on training msn 5 May 45	
XVIII	B-24M-10-CO	44-41996	96978S	4 Jan 45	26 Jan 45	3 <sup>rd</sup> PRS May– Aug 45	"Ramp Champ" nose art
C-1	B-24J-150-CO	44-42106	96974-S	2 Jan 45	23 Jul 45	Assigned to Eglin Field for test	
0	B-24M-150-CO	44-40225	DOM 129-B	20 Jan 45	18 Apr 45	March Field, RCM Training – Jun 45	
Unk	B-24M-30-FO	44-51802	DOM 131-B	31 May 45	N/A	March Field, RCM Training – Aug 45	
Unk	B-24M-25-FO	44-51356	DOM 126-B	31 Mar 45	N/A	March Field, RCM Training – Aug 45; Serial numbers of other 2 DOM 126-B aircraft unknown	

receivers were also installed in later ferrets to enable COMINT collection against enemy communications. All ferret aircraft carried this basic fit – accurate navigation equipment, radar receivers, direction finders, signal analyzers – though the actual equipment evolved throughout the war as enemy equipment changed and more was learned about the SIGINT business.

The program's next iteration, Ferret II, was built based on experience from the construction and deployment of Ferret I. Unfortunately, its performance was dubbed "inadequate" and the aircraft was never operationally used, instead staying in Florida

for test and training purposes.<sup>4</sup> After Ferret I's Alaska adventures, the USAAF took an eight-month hiatus from ferret activity against the Japanese, preferring to let the U.S. Navy (USN) pick up the ELINT mantle in the Pacific Theater. The Navy continued where the USAAF left off, modifying patrol aircraft with Naval Research Laboratory receivers to continue the search for Japanese radar sets.

#### B-17s for the Mediterranean

The next group of ferrets was developed to map German surface search and early warning radars in



B-24M 44-41996 Ferret XVIII aka "Ramp Champ" was one of three B-24M ferrets assigned to the 3d PRS. A Project 96978S aircraft, she's depicted on June 7, 1945, two days after Mission No. 8 to Tori Jima.

**AS MISSIONS WERE FLOWN AND EXPERIENCE GAINED, THE B-17 FERRETS WERE EQUIPPED WITH UPGRADED RADAR RECEIVERS AND BETTER NAVIGATION EQUIPMENT**

preparation for the invasion of Sicily in the Mediterranean Theater of Operations. Three B-17F aircraft were allocated for conversion to the ELINT role; their sensor suites were based on experience gained from Ferret I's missions in Alaska. The first aircraft, Ferret III, was sent to Wright Field and Boston for her transformation. Additional fuel tanks were installed in the bomb bay, and a Radar Observer's position was built in the radio room with racks for receivers and seats for two observers. Completed in mid-April 1943, Ferret III departed the U.S. on April 22 and soon arrived in Tunisia. Once there, the attached Radar Observers talked with the co-located ELINT operators of Royal Air Force 192 Squadron and ended up modifying Ferret III by relocating oscilloscopes for better analysis and revising direction finding antenna arrangements. Initial test missions were flown in May 1943 and by June Ferret III had settled into a routine. By the end of the summer, Ferrets IV and V joined their sister ferret in flying operations against Axis radar sites in Italy, Sicily and the southern coast of France.<sup>5</sup>

Initially the B-17 ferrets and their crews were a detachment administratively assigned to the 64th Troop Carrier Group, but it soon evolved into the "GR" (General Reconnaissance) Squadron. Lack of a formal organizational structure caused supply headaches and other challenges, so the unit was redesignated as the 16th Reconnaissance Squadron (Heavy) Special in September 1943 and formally aligned under the Communications Section of Twelfth Air Force.<sup>6</sup> As missions were flown and experience gained, the B-17 ferrets were equipped with upgraded radar receivers and better navigation equipment to enable more accurate ferret operations. These modifications were performed in the field by crew members and engineers on loan from the Radio Research Laboratory.

The Radio Research Laboratory (RRL), located on the campus of Harvard University, was an example of the total mobilization of the nation for the war effort. This small facility was under the direction of the U.S. Office of Scientific Research and Development and was a spinoff of radar research being performed by the Radiation Laboratory at Massachusetts Institute of Technology. RRL was established in early 1942 to develop methods of jamming enemy radars and communications, as well as ways to protect allied radars from enemy jamming.<sup>7</sup> RRL would continue to play a major role in the development and refinement of receivers for the ferret program, sending technical representatives into the field to monitor the performance of equipment and make recommendations for improvement.

Once the invasion of Sicily was complete, the Mediterranean ferrets changed focus and took on an expanded role. The squadron grew, absorbing four radar jammer-equipped B-17s and personnel originally sent over to support the Sicily invasion. In addition to searching for German radars, the unit oversaw electronic warfare for Twelfth Air Force's strategic bombing campaign by developing and testing radar jammers and overseeing their installation and maintenance in heavy bomb group aircraft, among them the B-17s of the 97th Bomb Group.<sup>8</sup>

The 16th RS (H) SP was getting a reputation as an outfit that liked to tinker with its equipment; in fact, the squadron adapted some B-17s for use as ferrets from aircraft originally destined for the jammer role. All told, at least four additional B-17E/F aircraft were modified either locally by the squadron or at bases in England to carry radar receivers on operational missions. This overseas ferret production produced aircraft similar in capability to the original B-17 ferrets; it included ELINT equipment, navigation upgrades, and a new mottled black camouflage paint job for night operations. Two of these field modifications were subsequently lost in combat operations. One of them, a B-17E (AAF Ser. 41-9016 – see Table 2), flew into a Spanish mountain in bad weather the night of December 6, 1943; the other, a B-17F, went down off the Italian coast six weeks later.<sup>9</sup> In early November 1943 Ferrets III and IV returned to the U.S. to become ELINT training aircraft, thus leaving the squadron with only three operational ferrets to perform its duties – the original Ferret V and two field modified birds.

The 16th RS (H) SP continued its ferret work until the Germans were evicted from the western Mediterranean in late summer of 1944; at that point, the squadron was ordered back to the US. Until then, the unit had continued to modify and improve mission equipment at its overseas bases. For example, squadron technicians designed a concentric-line frequency meter along with the C-2100 radar receiver antenna which was subsequently manufactured in the U.S. and shipped overseas.<sup>10</sup> In the end, however, the European theater proved to be something of a dead end for USAAF ferret development. The Royal Air Force had already fielded a dedicated electronic warfare unit, 100 Group, which



WITH ALLIED PARTNERS PROVIDING THE MAIN EFFORT IN MONITORING GERMAN RADAR DEVELOPMENT, THERE WAS LITTLE ELSE THE U.S. COULD CONTRIBUTE TO THE CAUSE

THE PACIFIC THEATER, HOWEVER, WAS A DIFFERENT STORY

**Table 2 - Known Field Modification Ferret Aircraft**

Aircraft Type	Serial Number	Unit Assignments	Notes
B-24D?	Unk	14 <sup>th</sup> AF	"Interim Ferret"; constructed May-July 1944; flew missions Aug - ?? 1944; replaced by Ferret XIII
B-24J-195-CO	44-41464	13 <sup>th</sup> AF – 868 BS; Field Unit 13, Section 22	"Lady June II" nose art; departed CONUS 10 Oct 44; likely built by Section 22
B-24D-CO	41-11924	11 <sup>th</sup> AF – 404 BS, 28 BG	"Duchess" nose art; first mission 20 Jan 45; lost on 1 May 45
B-24D-CO	41-23886	11 <sup>th</sup> AF – 404 BS, 28 BG	"Little Girl" nose art
B-17F-100-BO	42-30379	12 <sup>th</sup> AF - 16 <sup>th</sup> RS	Lost 25 Jan 44
B-17F-65-BO	42-3358	12 <sup>th</sup> AF - 16 <sup>th</sup> RS	"Thunder Head" nose art
B-17F-105-BO	42-30437	12 <sup>th</sup> AF - 16 <sup>th</sup> RS	Begins to get mention in 16 RS histories in mid-December 43. There is no specific mention of its acquisition

supported both UK and U.S. strategic bombing efforts across Western Europe. With allied partners providing the main effort in monitoring German radar development, there was little else the U.S. could contribute to the cause. The Pacific theater, however, was a different story.

#### **Initial Production Lots of B-24 Ferrets for the Pacific Theater**

Activated in Brisbane, Australia in July 1943, Section 22 reported to the Chief Signal Officer of General Douglas MacArthur's General Headquarters of the Southwest Pacific Area (SWPA). Section 22 combined all Allied efforts – not only USAAF and USN but also British Commonwealth and Dutch personnel – in a coalition effort to both understand the Japanese use of radar and to develop countermeasures against it to ensure Allied operational successes.<sup>11</sup> Within a few months of establishment, Section 22 defined a requirement for dedicated USAAF ferret aircraft to support their activities. This was a rush job, with SWPA desiring the receipt of the aircraft little more than a month after the USAAF's Material Command was notified. With no time to build a prototype, the Air Staff recommended Material Command use Ferret I as a starting point for installing the necessary ELINT equipment.<sup>12</sup>

Material Command had been established on March 9, 1942 when the pre-war Air Corps Material Division was expanded to command status. Material Command oversaw research and development activities as well as procurement of aircraft and other items for the USAAF. Headed by Brigadier General O.P. Echols, Material Command was based at Wright Field where the command con-

ducted the majority of its work. Initial ferret design work was done by the Engineering Division, an organization that enabled the service to modify existing aircraft for new purposes or to fit theater-specific requirements. The Production Division, also at Wright Field, coordinated with aircraft manufacturers for the actual production of wartime aircraft.<sup>13</sup>

Plans for Project 96288R – the production of two ferrets for SWPA – were quickly drawn up by the Engineering Division and sent to the 1st Proving Ground Electronics Unit of the Air Service Command at Eglin Field, Florida. Two new production Consolidated B-24D aircraft left the Tucson Modification Center after having post-production work performed on them and arrived at Eglin in late September for their transformation into ferrets. A plywood compartment was built in the aft section of the bomb bay to house two Radar Observers, with seats on the right side and equipment racks on the left. Personnel from Wright Field and the Radio Research Laboratory assisted in the modifications.<sup>14</sup>

In January 1944 the two modified B-24Ds, now identified as Ferrets VII and VIII (the Ferret number VI being skipped for unknown reasons), arrived at their base in New Guinea. Although administratively assigned to the 63d Bomb Squadron, 43d Bomb Group for maintenance, the mission tasking of the ferrets was controlled by Section 22. After operating the aircraft for a few months, the ferrets were further modified in Brisbane, Australia by a group in Section 22 responsible for development work and adaption of existing equipment.<sup>15</sup> Equipment location within the Radar Observer compartment was changed around to ease operation while flying. The navigator's station was also

WHEN A  
FERRET  
WASN'T  
IMMEDIATELY  
FORTH-  
COMING,  
FOURTEENTH  
AIR FORCE  
DECIDED TO  
LOCALLY  
CONSTRUCT  
ONE

Table 3 – Definitions and Acronyms

SIGINT	Signals Intelligence. SIGINT is intelligence derived from electronic signals and systems used by foreign targets, such as communications systems, radars, and weapons systems. SIGINT provides a vital window for our nation into foreign adversaries' capabilities, actions, and intentions. SIGINT has two components: COMINT and ELINT.
ELINT	Electronic Intelligence. Technical and geo-location intelligence derived from foreign non-communications electromagnetic radiations – usually ground and ship-based radar sets.
COMINT	Communications Intelligence. Technical information and intelligence derived from foreign communications by other than the intended recipients
SWPA	Southwest Pacific Area - operational area in the Pacific under the command of General Douglas MacArthur
RCM	Radar Countermeasures – WWII term that referred both to 'passive' RCM (ELINT in today's vernacular) and 'active' RCM (electronic attack)
RRL	The Radio Research Laboratory (RRL), located on the campus of Harvard University, developed methods of jamming enemy radars and communications, as well as ways to protect allied radars from enemy jamming.
ATSC	Air Technical Service Command

re-arranged for optimum employment and the navigation radar upgraded. Additional improvement ideas were also passed on to Air Staff with respect to equipment and layout.<sup>16</sup> Section 22 would continue to modify SWPA ferrets through the end of the war, tweaking antennas and equipment to optimize performance and passing results back to the U.S. for incorporation into future ferret development.

Handling the ferret workload in Washington for Air Staff was Lt Col George Hale, the Communications Equipment Officer who worked for the Assistant Chief of Air Staff, Materiel, Maintenance and Distribution. Hale oversaw requirements for Ferrets VII through XI, deftly overseeing DC bureaucracy from mid-1943 through mid-1944. Even as Ferrets VII and VIII were arriving in theater, the requirement for a ferret aircraft in the South Pacific Theater was validated by Lt Col Hale, and the 1st Proving Ground Electronics Unit at Eglin was told to commence work. Though completed by March 1944, there is no evidence that this aircraft - Ferret IX - ever made it overseas and she disappeared from the scene by mid-1944. The aircraft did act as a bridge between the earlier ferrets and the next group of four aircraft as it carried updated avionics purpose-built for the SIGINT mission as opposed to the modified commercial receivers found in earlier ferret construction.<sup>17</sup>

Like Twelfth Air Force in the Mediterranean, the numbered air forces in the Pacific developed their own ferret aircraft to meet local needs. At least three B-24D and one B-24J aircraft were modified overseas without the assistance (or approval) of Air Staff or Material Command (See Table 2). Alaska-based Eleventh Air Force modified two B-24D air-

craft for ferret work, with missions commencing in January 1945. Just like their Southwest Pacific brethren, these aircraft were assigned to a conventional bomber unit (the 28th Bomb Group's 404th Bomb Squadron) for maintenance and administrative oversight. The actual mission tasking and reporting was through the Signal Officer assigned to the Eleventh Air Force. While little is known about their production, one of the aircraft was lost on a mission on May 1, 1945.<sup>18</sup> Thirteenth Air Force reports identify a B-24J ferret operating with the 868th Bomb Squadron with tasking from Field Unit 13 of Section 22. The 868th flew radar-equipped Liberators designated SB-24s in the South Pacific area and was tasked with the nocturnal targeting of Japanese shipping. The B-24J ferret employed by the squadron to map Japanese radars did not pass through Wright Field and was likely built by Section 22 in theater. A similar modification was made by Section 22 to a B-25 ferret flown by another South Pacific unit, the 100th Bomb Squadron.<sup>19</sup> Curiously, the South Pacific was the original destination of Ferret IX but there is no record of her leaving the US.

Due to logistical challenges and low priority in the global war, the China-based Fourteenth Air Force did not field heavy bombers until early 1944.<sup>20</sup> As the tempo of the 308th Bomb Group increased, Fourteenth Air Force staff recognized that their knowledge of the Japanese Army air defenses in China was lacking and by April 1944, a ferret aircraft was requested from Air Staff. When a ferret wasn't immediately forthcoming, Fourteenth Air Force decided to locally construct one and a B-24D was subsequently modified by an in-theater RRL



engineer and dubbed "Interim Ferret". The Interim Ferret flew its first operational missions against Japanese radars in western China in August 1944.<sup>21</sup>

### Ferret Production Picks Up

While the Fourteenth Air Force was building their Interim Ferret, Air Staff was refining requirements for the next group of ferrets. Project 90754-S called for the building of two B-24J ferret aircraft for service in the China-Burma-India (CBI) Theater. This project marked the transition of ferret aircraft from B-24D to B-24J aircraft. The 'J' model, like the earlier 'H' model, was the result of a design effort to improve the defensive firepower of the B-24D aircraft.

Arriving at Patterson Field in June 1944, the Project 90754-S birds were the first ferret aircraft routed through Ohio for modifications since the B-17 ferrets. While documentation on their electronic fit is lacking, they appear to have incorporated lessons learned in the field by Section 22. As opposed to earlier ferrets which utilized the Aircraft Radio Laboratory spaces, the B-24J aircraft were modified at Air Service Command's Fairfield Air Depot at Patterson Field. After almost two months of work, the aircraft, dubbed Ferrets XII and XIII, were sent to Eglin Field for testing. Flaws with the design of the direction finding antennas were discovered and the 1st Proving Ground Electronics Unit worked with RRL to develop a solution. Another two months would pass as the Eglin engineers worked to trouble shoot the B-24J aircraft. By the end of the year the aircraft were finally ready for overseas work, with Ferret XII delivered to Tenth Air Force and XIII going to Fourteenth Air Force to replace the Interim Ferret. Even before Ferrets XII and XIII had left Ohio, the next aircraft were entering the production line.

A requirement for two "radar investigational search" aircraft for service with the Fifth Air Force in the Southwest Pacific Area was passed on to Material Command from Lt Col George Hale on Air Staff in late March 1944. Air Staff suggested Material Command incorporate ideas from a report by Clark Cahill, a civilian RRL technical representative who had worked with Ferrets VII and VIII in theater. Air Staff also recommended Material Command consult with Air Service Command in Eglin on lessons learned from the construction of prior ferrets.<sup>22</sup> These two aircraft, designated Ferrets X and XI, arrived in Ohio in mid-July 1944 from a pool of B-24J aircraft that had already passed through a modification center to receive changes for the Pacific theater.

These aircraft, designated Project 96508R, used some of the existing engineering work from the prior two ferret aircraft. The engineers in Ohio were able to consolidate the ELINT equipment into the rear bomb bay, increasing efficiency from the scattered placement in previous aircraft. The forward bomb bay was outfitted with two 450 gallon fuel tanks to extend the range.<sup>23</sup> As Ferrets XII and XIII

were tested at Eglin Field, results from their trials were fed back into the Project 96508R production line. Following production, Ferrets X and XI departed for Florida, arriving at Eglin Field in late October 1944. While in Florida, Ferret XI was redesignated Ferret VI and her assignment changed from Section 22 to the newly-forming XXI Bomber Command, then just arriving at Guam. A new Ferret XI was put into the mix but would be delayed by higher priority work at Fairfield Air Depot. Based on evolving requirements from Air Staff derived from theater feedback, its original equipment fit changed considerably in the six months that it bounced between Eglin and Patterson Fields.<sup>24</sup>

Like the two ferrets before them, Ferrets VI and X were not well received by the test engineers at Eglin Field. Wiring was "mashed," antenna motor shafts sheared, antenna leads mismarked, and "numerous small items" requiring attention pointed to the inexperience of the Ohio production line with building ferret aircraft. These discrepancies precipitated a letter from Colonel Doubleday on Air Staff that requested Wright Field investigate the matter and report back to Washington with the results.<sup>25</sup> In late January 1945, Ferret X finally left Eglin Field for overseas and checked in with Section 22 in mid-February 1945. Ferret X arrived almost a year after the requirement was identified, a victim of design work, delayed testing and re-work performed at Eglin. The new Ferret XI followed two months later. By this time, Ferrets VII and VIII were worn out from hard use and were stricken from the inventory shortly after their replacements arrived. As Ferret XI started production, another aircraft arrived in Ohio for conversion to the ferret mission. Dubbed "Ferret 0," the aircraft was to be assigned to Eglin Field for testing. A test bed aircraft would allow engineers to wring out new equipment before it was fitted to a ferret aircraft on the production line and hopefully catch errors before the aircraft were deployed overseas.

By late 1944 the nascent SIGINT business was becoming a well developed organization. Overseas requirements for the development of specific equipment were forwarded through the theater Chief Signal Office back to the Washington via report or message. Handling the requirements in DC was the Chief Signal Office at War Department who coordinated with Air Staff for airborne requirements.<sup>26</sup> Actual engineering for SIGINT receivers continued to be performed by RRL at Harvard who had overseas technical representatives to ensure research met stated theater requirements.<sup>27</sup> The Air Staff had also undergone reorganization in late 1944. The new project officer for the ferret program was Col D. C. Doubleday, Chief of the Engineering Branch of the Material Division. This division fell under the new Assistant Chief of the Air Staff for Material & Services. Doubleday would oversee the completion of Ferret XI and the upcoming large scale production of ferrets. He was assisted by the Chief of Aircraft Projects Branch, initially Colonel J.A. Gibbs and later Colonel R.G. Bunker. These officers over-

LIKE THE TWO FERRETS BEFORE THEM, FERRETS VI AND X WERE NOT WELL RECEIVED BY THE TEST ENGINEERS

BY LATE 1944 THE NASCENT SIGINT BUSINESS WAS BECOMING A WELL DEVELOPED ORGANIZATION

Detail photo of field modified B-24D-CO 41-23886 "Little Girl," operated in Alaska by 11th Air Force's 404th Bomb Squadron. (Photo courtesy of Radar Magazine No. 4)



## ALLIED AIR- MEN HAD LIMITED KNOWLEDGE OF THE EXPANDING JAPANESE RADAR CHAINS OF LITTORAL CHINA AND THE JAPANESE HOME ISLANDS

saw ferret production for the remainder of the war, providing requirements and directing allocation of modified aircraft.

While CBI-based Ferrets XII and XIII adequately supported the B-24s of the 7th and 308th Bomb Groups by mapping radars in Burma and central China, intelligence gaps still existed. Allied airmen had limited knowledge of the expanding Japanese radar chains of littoral China and the Japanese Home Islands – the emerging target set for the XX Bomber Command (BC).<sup>28</sup> While AN/APR-4 equipped XX BC B-29s aided in the development and fielding of radar jamming equipment, there were challenges with using the bombers in an ELINT role. An internal report of the United States Army Strategic Air Forces noted many challenges with using B-29s for radar reconnaissance, listing deficiencies ranging from procedures and training to equipment. In short, dedicated ferret aircraft were needed to support the strategic bombing effort against Japan.<sup>29</sup>

While still forming up in Colorado in September 1944, an internal staff memo from the XXI BC identified the requirement for an organic flight of four B-29 ferret aircraft.<sup>30</sup> This requirement worked its way through the administrative wickets into the Reconnaissance Branch of Headquarters, Army Air Forces in Washington and was formally discussed on November 19. On that date, a telephone conversation between Brigadier General Haywood Hansell, XXI BC commander, Major General Millard Harmon, Commander of the Strategic Air Force of the Pacific Ocean Area, and General "Hap" Arnold discussed the way forward on XXI BC ferrets. They agreed that ELINT aircraft were needed to assist the bombing campaign against Japan by identifying electronic threats and helping in subsequent radar jamming efforts. One ferret aircraft was promised immediately and an

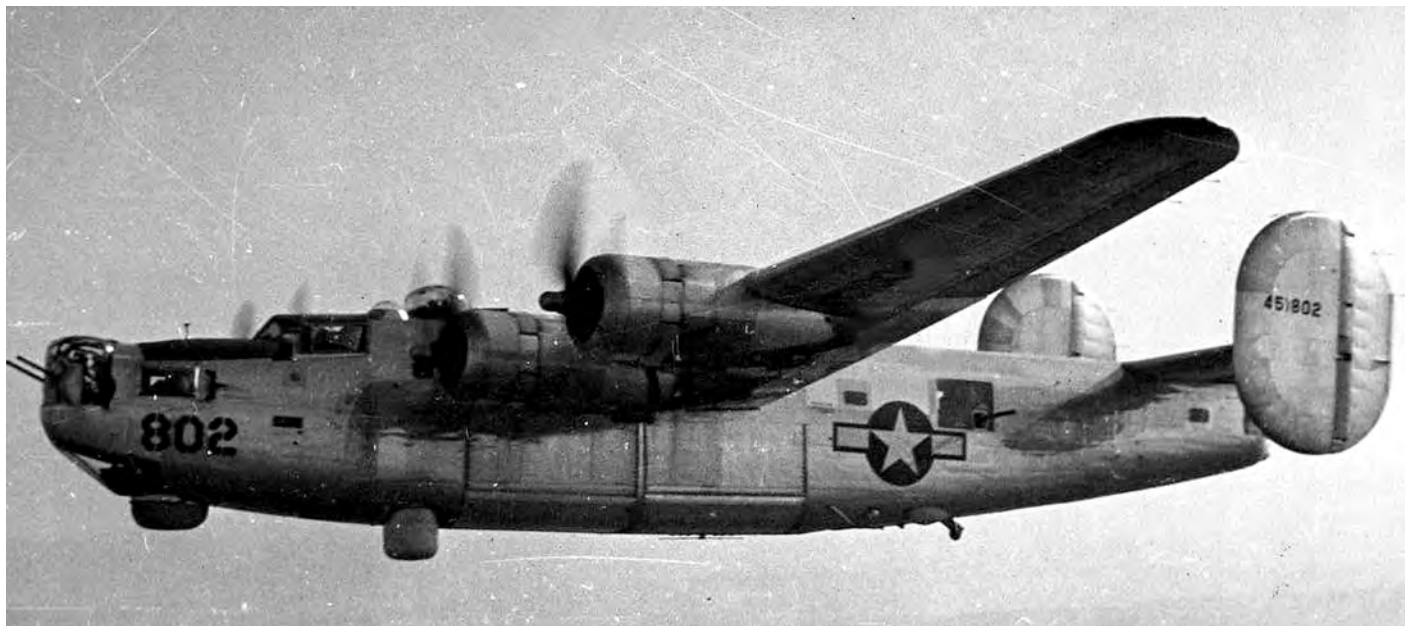
additional five ferrets were noted as the necessary force to create a Radar Countermeasures (RCM) flight assigned to the XXI BC.<sup>31</sup> Twentieth Air Force soon authorized augmenting the XXI BC's long range photo reconnaissance squadron, the F-13 equipped 3d Photo Reconnaissance Squadron (Very Long Range) (3d PRS), with a flight of RCM reconnaissance aircraft composed of four primary and two reserve ferret aircraft with eight flight crews and support personnel as required. Ferret VI, scheduled to depart the United States on December 24, was seen as the first installment on this new unit and was to be followed up with five additional ferret aircraft on or about February 17, 1945.<sup>32</sup>

Originally delivered to Ohio as Ferret XI, B-24J 44-41124 was re-designated Ferret VI during testing at Eglin Field. After modifications and crew training, she departed the continental United States on January 5, 1945. Upon arrival at Hickam Field, Hawaii Ferret VI was delayed for modification at the Hawaii Air Depot.<sup>33</sup> Due to time constraints, the original plan to completely update Ferret VI with theater-directed modifications was cancelled, and the Depot merely changed the location of the AN/APA-24 direction finding antenna instead. After a series of calibration flights, Ferret VI departed Hickam Field on February 21 and joined the 3d PRS on Guam on the 23d of the month.<sup>34</sup>

### A Change in Business Rules

On December 6, 1944, the Assistant Chief of the Air Staff for Material & Services outlined the requirements to Air Technical Service Command (ATSC) for Project 96978S, the five ferrets promised to the XXI BC the month prior. The actual details were very specific, outlining not only the equipment fit such as radar receivers and navigation equip-





B-24M-30-FO 44-51802 was one of at least four ferrets assigned to March Field, California, for crew training. The sole aircraft from Project DOM 131-B, she arrived at March Field in late July 1945. (Photo courtesy of Chuck Varney.)

## THE FOUR NEW B-24M FERRET AIR- CRAFT MET UP WITH FERRET VI AT GUAM

ment but also aircraft heating, Radar Observer compartment details, and other design specifications with an eye on lessons learned from prior ferret aircraft. Project 96978S was considered "very urgent" and the aircraft were required to be at Eglin Field ready for shake down testing by February 1, 1945. Bi-monthly reports were demanded in order to keep Washington apprised of the progress.<sup>35</sup>

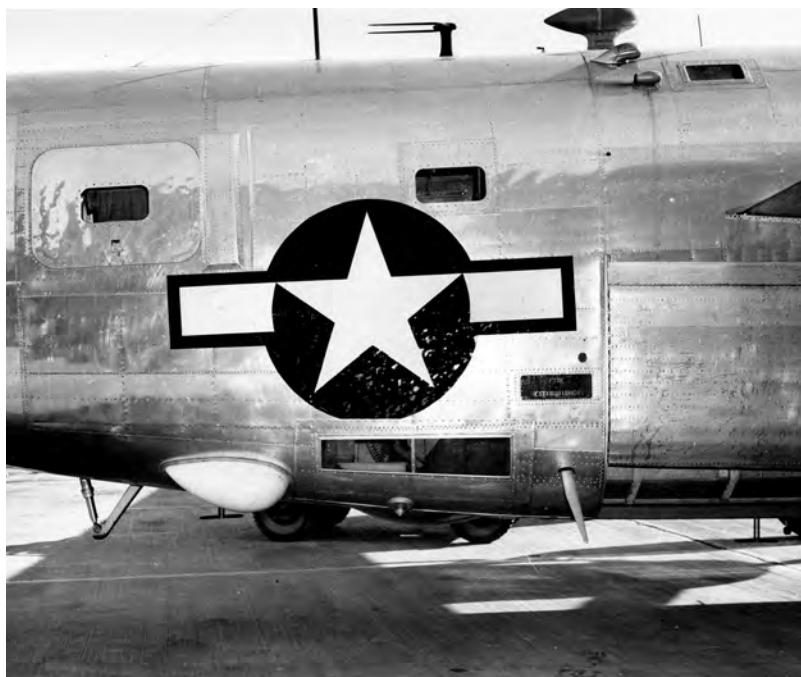
Not only was the timeline challenging, but so was the number of aircraft. Until to this point, ferret aircraft were essentially hand-built by engineers in batches of one to two aircraft over a matter of months. But if any unit could meet this new demand supply, it was ATSC. The Army Air Forces Air Technical Service Command at Patterson Field was created through the merger of Material Command and Air Service Command on August 31, 1944. This new command directed both logistical and engineering efforts of the Army Air Forces. ATSC was headed by Lieutenant General W.S. Knudsen. The former Engineering Division of Material Command continued to do design work for the ferret program, working with Wright Field's Aircraft Radio Laboratory in the development of all remaining wartime ferrets.<sup>36</sup>

Five B-24M-10-CO aircraft produced in late December 1944 were diverted to Fairfield Air Depot for Project 97978S and arrived the first week of January 1945. The 'M' model was the last production version of the B-24 series and was essentially an 'L' model with additional weight savings, the 'L' model being a lighter weight version of the B-24J. The XXI BC ferrets had priority at Fairfield, displacing the partially-built Ferret XI and pushing Ferret O's start date out to late February.<sup>37</sup> ATSC actually pushed the five ferrets through the modification line in a little over three weeks, with the new ferrets (Ferrets XIV – XVIII) arriving at Eglin Field, Florida for a two week stay before departing for overseas operations. During this process, a decision was made to assign Ferret XVII to a new ferret course set up as the RCM Reconnaissance Training

Program at March Field, California. The other four aircraft departed for Guam in mid-February 1945.<sup>38</sup> Ferret O was produced according to the same engineering specification as the XXI BC aircraft, spending six weeks at Eglin Field before joining Ferret XVIII at March Field to assist in training.<sup>39</sup>

As in earlier ferrets, the Project 97978S aircraft had a compartment built in the former aft bomb bay to house the new ferret equipment and its operators, the bomb racks being removed and aircraft-grade plywood being used to construct walls and a floor. Fuel tanks added in the forward bomb bay were an important element of the modification that enabled longer missions. The 8.5 x 5.5 foot ferret compartment provided housing for the two Radar Observers and their equipment. Racks were mounted along the port side of the fuselage and separate work stations were built for each of the operators. Located above and behind the Radar Observer positions was the radar operator's post, with access to the SCR-717 radar and AN/APN-1 and SCR-718 radar altimeters. The navigator was moved from the nose to the flight deck behind the pilots and had a repeater for the SCR-717 and SCR-718 units and AN/APN-4 precision navigation receivers. The radar operator and navigator worked as a team to precisely plot the location of the aircraft to enable accurate signal plotting by the Radar Observers. To ensure maximum efficiency between these three locations, an interphone system connected the ferret compartment crew with the navigator and radar operator.<sup>40</sup>

The four new B-24M ferret aircraft met up with Ferret VI at Guam, all aircraft arriving within days of each other in late February 1945. Unfortunately, Ferret XV B-24M 44-41985 was lost due to a blown tire upon completion of a training flight shortly after it was delivered to Guam.<sup>41</sup> The remaining four ferret aircraft were assigned to Guam Air Depot for modification work to bring the B-24s up to theater standards. Some additional work was also done on the mission equipment - the



Detail photo of an unknown B-24 ferret aircraft at Hickam Field, Hawaii. Likely Ferret VI, some of the ferret modifications are visible including windows added along lower fuselage side near ball turret position; AT-38/APR-4 stub antenna at right, AS-44/APR-5 blister antenna at center, and opaque blister with AS-49/APR-4 at left.

## THE INITIAL PLAN WAS TO INSTALL RADIO RECEIVERS AND VOICE RECORDERS OPERATED BY A RADAR OBSERVER ON ONE TO TWO B-29 BOMBERS IN EACH SQUADRON

AN/APA-24 on the B-24Ms was moved from under the ferret compartment to the position formerly occupied by the belly turret, a modification to Ferret VI undertaken by the Hawaii Air Depot.<sup>42</sup> Since Ferret VI was intended to fly mainly at night, her defensive armament was reduced to just flexible tail guns; originally two aircraft were slated for this modification but with the loss of Ferret XV only Ferret VI was converted.<sup>43</sup> The B-24M ferrets left the Guam Air Depot on April 27 with Ferret VI following almost a month later in the last part of May due to extensive modifications required by stripping her turrets.<sup>44</sup>

The 3d PRS and attached RCM (or R) Flight fell under the control of Twentieth Air Force for the purpose of supporting the strategic bombing campaign against Japan. Missions were flown in conjunction with bomber strikes on the Japanese Home Islands, with the ferrets orbiting off the coast to monitor enemy radar activity. Day-to-day control of the RCM mission was handled by the Countermeasures Air Analysis Center, a unit that reported directly to the Strategic Air Force, Pacific Ocean Area commanded by the Deputy Commander, Twentieth Air Force. In both form and function, it was similar to the SWPA-based Section 22's control of Ferrets X and XI.<sup>45</sup>

The initial RCM plan for the XXI BC was drafted in December 1944. Covering radar and radio reconnaissance, the plan emphasized the need to intercept enemy air-ground communications to better understand Japanese fighter direction tactics.<sup>46</sup> The initial plan was to install radio receivers and voice recorders operated by a Radar Observer on one to two B-29 bombers in each squadron, but the program immediately ran into problems with equipment installation, lack of linguists, and integration. The preferred solution was an aircraft dedicated to radio reconnaissance with sufficient Japanese language linguists and equipment aboard

to intercept and translate up to twelve channels of Japanese HF and VHF radio communication.<sup>47</sup>

Back in the US, a dedicated COMINT reconnaissance aircraft was initially discussed in October 1944. By early December, Air Staff ordered ATSC to modify a B-24J into a COMINT ferret dubbed "C-1" that incorporated radio receivers and three operators into the rear bomb bay of the aircraft in an arrangement similar to that used by Ferrets XIV-XVIII. Though the radar ferrets had priority in engineering, as soon as their development work was done the C-1 was to be next in line.<sup>48</sup> Air Staff had initially directed six B-24s be diverted from radar ferrets to C-1 COMINT ferrets in late March 1945, but for unknown reasons within two weeks the order was reversed and only Ferret C-1 was produced.<sup>49</sup>

Not to be deterred, the 3d PRS continued their quest to acquire a COMINT capability. As delivered, the 3d PRS' ferrets were equipped with two radio receivers. Guam Air Depot added voice recorders and seats in the former navigator's position in the nose to enable two radio search personnel to perform their function.<sup>50</sup> The B-24M ferrets were only able to accommodate two channels of voice intercept without impacting radar search operations while Ferret VI, the sole B-24J, could handle three voice channels. Ten Japanese linguists from the local 8th Radio Squadron Mobile volunteered for flight duties and manned the ferrets, providing an interim COMINT capability used by the 3d PRS for the last few months of the war.<sup>51</sup>

## Ferret Production Line

The utility of ferrets to support theater and strategic bombing efforts had been proven by the early production ferrets along with the field-modified interim ferrets. Based on this information, Air Staff directed Wright Field to look into a follow-on production lot of ferrets after the XXI BC ferrets of Project 96978S were built. By late 1944, plans were in place to produce at least eight more ferrets within the coming six months.<sup>52</sup> Two months later, in early February 1945, ATSC solidified the new production line in an official memo. Ten ferrets were planned, with the first airplane scheduled to be completed on May 1, and four more per month to be completed for the remainder of the year. The basis for these aircraft was the engineering done for Project 96978S, the XXI BC ferrets, as captured in Technical Instruction 2024 Addendums 14 and 27.<sup>53</sup>

Hangar space and manpower limited the production line at Fairfield to five aircraft at a time even with personnel on a 12 hour per day, seven day a week work schedule.<sup>54</sup> Four aircraft per month for months on end could not be handled in-house by Patterson Field, so instead ATSC turned to the existing system of modification centers that aided U.S. aircraft production. Modification centers were a result of the American style of producing of aircraft in the Second World War. To expedite aircraft changes required for an export customer or modifications dictated by a combat theater, modification



In-flight photo of a B-17F Ferret aircraft. Serial number 42-3358 was one of four aircraft modified in-theater by the squadron. This aircraft displays a standard camouflage scheme with yagi DF antennas above the radio operator's compartment.



**JUST WHEN  
THE FERRET  
PRODUCTION  
LINE WAS  
FINALLY  
ESTAB-  
LISHED AND  
RUNNING AT  
FULL STEAM  
THE WAR  
STARTED TO  
CHANGE**

centers were established in January 1942. About twenty modification centers were opened during the war, though not all were in operation at the same time. The centers started out as repair and maintenance facilities for the nation's major airlines, but eventually grew into dedicated factories. This growing mass of production sites was managed by the Production Division at Wright Field. Two of the modification facilities were set aside in late 1944 to handle rush orders – United Cheyenne (Wyoming) and Bechtel-McCone-Parsons Birmingham (Alabama) – and ATSC chose the former to establish a ferret production line.<sup>55</sup> Engineering drawings, wiring diagrams, and photographs were sent to Cheyenne from ATSC's Systems Engineering Laboratory. An aircraft was set aside at the modification center as a prototype ferret to verify the plans worked and provide a real world example for employees to refer to.<sup>56</sup> This Cheyenne model ferret was started in late March and completed by May 1945. Minor equipment changes based on experience from the field continued to trickle in from Air Staff even as the production line started.<sup>57</sup> By mid-May fifteen ferrets were on order and in the production at Cheyenne.<sup>58</sup>

#### **The Final Deliveries**

Just when the ferret production line was finally established and running at full steam the war started to change. The surrender of Nazi Germany and the acceleration of the war in the Pacific wreaked havoc on the ATSC production planners in Ohio. The last production series was continually in a state of flux, with projects being added, cancelled, and updated in the last few months of the Second World War. Records indicate at least two domestic and seven overseas projects were carried on the books at one time or another. The two domestic projects delivered a total of four ferrets to Fourth Air Force for service at the RCM Reconnaissance Training Program at March Field where Ferrets XVII and 0 were stationed. Aircraft started to arrive in California in the summer of 1945, with two delivering in July.<sup>59</sup>

The overseas projects can be divided into three groups – replacements for field modified ferret aircraft, deliveries for new theater requirements, and deliveries for new strategic requirements. In the first category are aircraft that were scheduled for service with the Eleventh Air Force in Alaska and Tenth Air Force in India – neither of which were actually delivered before the end of the war. The second category, theater requirements, was driven by a change in the way the USAAF organized long range reconnaissance units. Army Table of Organization and Equipment 1-297, dated March 20, 1945 changed most of the F-7 equipped Combat Mapping Squadrons assigned to Pacific theater numbered air forces to Reconnaissance Squadrons, Long Range, Photographic. The 20th Combat Mapping Squadron, assigned to Fifth Air Force, was converted to a Reconnaissance Squadron, Long Range, Photographic-RCM on June 15, 1945 and authorized a ferret flight of four aircraft. Initially, Ferrets X-XIII were pulled from their existing assignments to Section 22 and Tenth/Fourteenth Air Forces and assigned to the 20th RS. New build aircraft, likely four in number, were ordered for the squadron with two of this batch actually en route to the Pacific when the war ended.<sup>60</sup> The conversion of the 20th RS may have been in anticipation of Operation OLYMPIC, the initial invasion of Japan. The squadron was part of Far East Air Forces under MacArthur and assigned the task of reconnaissance of the landing beaches and counter-air missions against Japan.<sup>61</sup>

The final requirement for new ferrets was to support the strategic war against Japan. Similar in form and function to the 3d PRS, the 1st Photo Reconnaissance Squadron, Very Heavy was training in the U.S. on the F-13 before deploying to the Pacific to support the XX Bomber Command of the Eighth Air Force. The Eighth Air Force, under the command of Gen Jimmy Doolittle, was in the process of redeploying to the Pacific Theater from Europe and re-equipping with B-29 bombers to aid the XXI Bomber Command in the strategic bombing campaign against Japan. Six B-24 ferrets were planned as an RCM flight similar to the 3d PRS,

Ferret XII, B-24J-180-CO 44-40815, was named "Alec-Tronix." She is depicted here with her crew including pilot Charles Beard. Ferret XII saw service in two theaters, being assigned to the Tenth Air Force before joining Fifth Air Force's 20th RS. (Photo courtesy of Charles Beard via Roger Cook.)



## JAPAN'S SURRENDER ON AUGUST 14, 1945, BROUGHT AIR COMBAT IN THE PACIFIC TO A SUDDEN HALT

with experienced personnel coming from the disbanding 16th RS (H) SP and aircraft scheduled for delivery from Cheyenne in June 1945.<sup>62</sup> Though the 1st PRS had organized its new RCM flight in June as planned, records do not indicate that any aircraft were actually delivered to the squadron.<sup>63</sup>

### The End – and the Beginning

Japan's surrender on August 14, 1945, brought air combat in the Pacific to a sudden halt. Two weeks later, on August 29, Air Staff cancelled all B-24 ferret production.<sup>64</sup> Though there was some initial planning to develop a ferret variant of the B-32, little evidence has been found that it went beyond the design stage.<sup>65</sup>

Two new ferrets for the 20th RS were enroute to the squadron when hostilities ceased. Other completed ferrets still in the U.S. were likely flown into storage at one of the many sites set up for this purpose in 1945. Ferret C-1 never deployed overseas and ended up at the AAF Center at Orlando, FL, with testing scheduled in December 1945 to verify equipment installation planned for a B-29 aircraft.<sup>66</sup> Overseas ferrets slowly returned to the U.S. as their squadrons were stood down. The four 20th RS ferrets returned at the end of the year, with Ferrets XI-XIII all being declared excess in November 1945; Ferret X lasted until January. The 3d PRS ferrets returned to the U.S. in late December and were turned over to the Reconstruction Finance Corporation for disposition in June 1946. By this time, the B-24 was deemed obsolete and mass scrapping of the World War Two fleet had commenced; by 1947, only seven Liberators were still on strength with the USAAF.

When the USAAF needed a ferret to investigate the downing of a C-47 over Yugoslavia in August 1946, they had to outfit a pair of Germany-based RB-17G photo-mapping aircraft with ELINT receivers – the wartime fleet of ferrets all had long-since been converted to aluminum ingots. By 1947, a ferret B-29 would come on the scene and lead the way for Cold War reconnaissance – using technology and techniques pioneered over the Pacific by the ferret B-24s.

### Operational Summary and Conclusion

While the number of ferret aircraft built during the war was small compared to total bomber production, their impact was significant for a group that never exceeded fifteen operational aircraft at any given time. The 16th RS aided in the invasion of Sicily and helped defeat the German air defenses of Southern Europe, managing USAAF electronic warfare for the Mediterranean theater. The Twentieth Air Force strategic bombing campaign against Japan was reliant on ELINT data from 3d PRS ferrets to enable radar jammers carried on B-29s to operate effectively against enemy radar-directed anti-aircraft artillery. The COMINT provided by the 3d PRS also increased understanding of Japanese air defenses and enabled planners to develop tactics to thwart the enemy. The subsequent low number of bomber losses to air defenses over Japan was due in large part to SIGINT support. Ferrets assigned to the Southwest Pacific Area aided their bomber compatriots as well, helping plot the limits of Japanese radar detection to enable air strikes to flow in to target areas with minimal warning to Japanese air defenses. Ferrets did not



accomplish any single operation on their own – they made existing operations better.

Though their contributions to the Second World War were significant enough, the ferrets of the 1940s would also impact the USAF through the Cold War and into modern times. Through their reconnaissance missions, the USAAF learned how to conduct warfare in the electromagnetic spectrum and increase their understanding of adversary radar systems. Techniques were developed and

personnel were trained on how to task, collect and analyze enemy communications and radar systems – all processes that are still in use today. In addition, airmen learned how to rapidly field new technology and modify it in the field – a predecessor to the quick reaction capabilities currently used by contemporary SIGINT units. The impacts of Ferret I have been felt over the past 73 years of airborne SIGINT reconnaissance – as they will for years to come. ■

## NOTES

1. Alfred Price, *The History of U.S. Electronic Warfare, Volume I*, (Washington: Association of Old Crows, 1984), pp. 47-49.
2. Assistant Chief of Air Staff, Operations, Commitments & Requirements (Air Communications Division), Memorandum to Chief Signal Officer, War Department, Sep. 1, 1943. Subject: Development of RC-164. File 413.44-R, Box 627, Entry 294 – Classified Central Decimal Files, RG 18, National Archives.
3. Price, pp. 52-55.
4. Price, p. 71; Headquarters, 16th Reconnaissance Squadron. Unit History, May 17, 1943 – Sep. 26, 1943. n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, May-Sep 43/IRIS 66538, Maxwell AFB, Ala.
5. Price, pp. 72-74; Norman Weed, "Ferrets," *Friends Journal*, Vol. 29, No. 3 (Fall 2006); Headquarters, 16th Reconnaissance Squadron. Unit History, May 17, 1943 – Sep. 26, 1943. n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, May-Sep 43/IRIS 66538, Maxwell AFB, Ala.
6. Price, pp. 74-75; Headquarters, 16th Reconnaissance Squadron. War Diary, September-October 1943. n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, Sep-Oct 43/IRIS 66537, Maxwell AFB, Ala.
7. Price, p. 21-23.
8. Radar, No. 4; Headquarters, 16th Reconnaissance Squadron. Unit History, May 17, 1943 – Sep. 26, 1943, n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, May-Sep 43/IRIS 66538, Maxwell AFB, Ala.
9. Headquarters, 16th Reconnaissance Squadron. Outline History, Month of December 1943. n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, Dec 43/IRIS 66536, Maxwell AFB, Ala.; Headquarters, 16th Reconnaissance Squadron. War Diary, September-October 1943. n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, Sep-Oct 43/IRIS 66537, Maxwell AFB, Ala.; Headquarters, 16th Reconnaissance Squadron. War Diary, November-December 1943. n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, Nov-Dec 43/IRIS 66553, Maxwell AFB, Ala.
10. Headquarters, 16th Reconnaissance Squadron. Unit History, May 17, 1943 – Sep. 26, 1943. n.d., Air Force Historical Research Agency, SQ-RCN-16-HI, May-Sep 43/IRIS 66538, Maxwell AFB, Ala.
11. Price, pp. 138-141; Kevin Davis, "Field Unit 12 Takes New Technology to War in Southwest Pacific," *Studies in Intelligence* Vol 58, No. 3 (September 2014).
12. Assistant Chief of Air Staff, Materiel, Maintenance and Distribution. Memorandum to CG, Material Command, Wright Field. Sep. 25, 1943, Subject: Installation of RCM Equipment in Ferrets VII and VIII. 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45 Folder, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives
13. History Support Office, Aeronautical Systems Command, "Splendid Vision, Unswerving Purpose," 2002 AF History and Museums Program, p. 95-96.
14. Price, p. 139; Individual Aircraft Data Card for 42-63991 and 42-64045, AFHRA.
15. Headquarters, Army Service Forces. Memorandum to the Assistant Chief of Staff, G-4, War Department General Staff. Jul. 22, 1944. Subject: RRL Prototype RCM Equipment for SWPA. SWPA RCM #1 1 of 2 Folder, Box 1488, Entry - Classified Central Decimal Files, RG 111, National Archives; Office of the Chief Signal Officer, Stock Control Branch, War Department. Material Requirements for Section 22, OCSigO, GHQ, SWPA. Feb. 22, 1944. SWPA RCM #1 2 of 2 Folder, Box 1489, Entry - Classified Central Decimal Files, RG 111, National Archives; Section 22, General Headquarters Southwest Pacific Area. Report No. OWW-6, Ferret Operations. April 24, 1944. Air Force Historical Research Agency, 178.46-188, Maxwell AFB, Ala.
16. General Headquarters, Southwest Pacific Area. Memorandum to Commanding General, Army Air Forces; Attention: Air Communications Section. Subject: Ferret Installations. Jun. 2, 1944. Air Force Historical Research Agency, 710.84-1, Jun 44, Maxwell AFB, Ala.
17. Assistant Chief of Air Staff, Materiel, Maintenance and Distribution. Memorandum to CG, Material Command, Wright Field. Jan. 28, 1944. Subject: Ferrets IX Installation. 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45 Folder, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.
18. 404th Bomb Squadron. Unit Historical Reports, January- May 1945. N.d. Air Force Historical Research Agency, 178.46-14, 178.46-136/137, 178.46-164/169, Maxwell AFB, Ala.
19. Field Unit Thirteen, Section 22. Various Memorandums and Reports dated October 1944 - March 1945. Air Force Historical Research Agency, 750.907, Maxwell AFB, Ala.; Individual Aircraft Data Card for 44-41464, AFHRA.
20. Steve Birdsall, *Log of the Liberators*, (Garden City: Doubleday and Company, 1973), pp. 163-177.
21. Price, pp. 160-163.
22. Assistant Chief of Air Staff, Materiel, Maintenance and Distribution. Memorandum to CG, Material Command, Wright Field. Mar. 23, 1944. Subject: Ferrets X and XI, Project Number 96508R. 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45 Folder, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.
23. Charles Beard's Story - Radar Counter Measures

in the CBI Theater; 7th Bombardment Group/Wing, 1918-1995; Robert Dorr, p. 183.

**24.** Maintenance Division, AAF Air Technical Service Command, Wright Field. Memorandum to Assistant Chief of Air Staff, Materials and Services. Nov. 6, 1944. Subject: Ferret XI; Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field, Dec. 15, 1944, Subject: Unsatisfactory Installation of Communications Equipment in Ferrets VI and X; both filed in Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

**25.** Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field. 15 December 1944. Subject: Unsatisfactory installation of Communications Equipment in Ferrets VI and X. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark.

**26.** Chief Signal office, GHQ SWPA. Classified Message to the Chief Signal Officer, Army Service Forces. Oct. 1, 1944. SWPA RCM #1 1 of 2 Folder, Box 1488, Entry - Classified Central Decimal Files, RG 111, National Archives.

**27.** Signal Corps Liaison Office, Radio Research Laboratory. Memorandum to Office of the Chief Signal Officer, Army Service Forces. Oct. 16, 1944. Subject: C-1900, Tail. SWPA RCM #1 1 of 2 Folder, Box 1488, Entry - Classified Central Decimal Files, RG 111, National Archives.

**28.** RCM Reports, dated Dec. 15, 1944 – Jan. 29, 1945, HQ XX Bomber Command. Air Force Historical Research Agency, 178.46, Maxwell AFB, Ala.

**29.** Office of the Air Communications, Headquarters United States Army Strategic Air Forces. Summary of RCM Activities in XXI Bomber Command, Period Dec. 18, 1944 to Mar. 31, 1945, pp. 1-9. Air Force Historical Research Agency, 703.907

**30.** Office of Communications Officer, Headquarters XXI Bomber Command, Memorandum to A-3 Section, no subject, dated Nov. 6, 1944. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945. August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala.

**31.** TELECON Message FL 19-1 192005Z November 1944, from Harmon to Hansell to Arnold / Norstad. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945. August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala.

**32.** Telecon Message No. H-13-3, COMAF 20 to DEPCOMAF 20, subject: Ferrets, Dec. 13, 1944. Air Force Historical Research Agency, SQ – PHOTO – 3 – SU – OP – S, Mar – Aug 1945.

**33.** Individual Aircraft Data Card for 44-41124, AFHRA; Memorandum from Director of Communications to Deputy Chief of Operations, subject: Ferret Aircraft, dated Dec. 31, 1944. Air Force Historical Research Agency, SQ – PHOTO – 3 – SU – OP – S, Mar – Aug 1945.

**34.** Army Air Forces Air Depot, APO #953, Routing and Record Sheet for Modification of B-24J #44-41124 (Ferret), Feb. 1, 1945. Air Force Historical Research Agency, SQ – PHOTO – 3 – SU – OP – S, Mar – Aug 1945; Headquarters, XXI BC. Central Pacific Newsletter No. 8, Apr. 8 1945. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945. August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala.; Joe

Riedel via Chuck Varney, e-mail, Jul. 25, 2009.

**35.** Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field. Dec. 6. 1944. Subject: Conversion of Five B-24-J Aircraft to Radar Ferrets. 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45 Folder, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives

**36.** Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field. Dec. 8, 1944. Subject: Modification of B-24J Airplane on Project 96974-S to C-1 Ferret. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives; History Support Office, Aeronautical Systems Command, “Splendid Vision, Unswerving Purpose”: 2002, AF History and Museums Program, p. 99-100.

**37.** Director, AAF Air Technical Service Command, Wright Field. Memorandum to Commanding General, AAF Attn: AFTMA-2F/7. Jan. 5 1945. Subject: Ferret Project – DP-516 – Report 1. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

**38.** Individual Aircraft Data Card for 44-41981, 44-41985, 44-41994, 44-41995, 44-41996, AFHRA.

**39.** Director, AAF Air Technical Service Command, Wright Field. Memorandum to Commanding General, AAF Attn: AFTMA-2F/7. Feb. 1, 1945. Subject: Ferret Project – DP-516 – Report 3. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives; Individual Aircraft Data Card for 44-40225, AFHRA.

**40.** “The Search for Jap Radar,” Radar, Issue 10, Jun. 30, 1945, Radiation Laboratory, Massachusetts Institute of Technology; reprinted March 1985 Product Support Department, Ferranti Defense Systems Limited; Air Technical Service Command Technical Instruction TI-2024, Addendum 14, Dec. 12, 1944 – located in Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

**41.** “The Search for Jap Radar,” Radar, Issue 10, Jun. 30, 1945, Radiation Laboratory, Massachusetts Institute of Technology; reprinted March 1985 Product Support Department, Ferranti Defense Systems Limited.

**42.** Headquarters, XXI BC. Central Pacific Newsletter No. 6, Mar. 10, 1945. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945, August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala.

**43.** Headquarters, XXI BC. Central Pacific Newsletter No. 8, Apr. 12, 1945. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945. August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala. There is some discussion on additional reasons for removal of the nose and upper turrets on Ferret 6. When transiting through Hickam Field, the Hawaii Air Depot voiced concern on the overloading of the aircraft and recommended removal of these weapons to bring her back into weight tolerances. This concern was not voiced by Guam Air Depot; curiously, the B-24M ferrets were just as heavy as B-24J Ferret 6 and no concerns have been found about their “overloading”. See Army Air Forces Air Depot, APO #953, Informal Action Sheet, Subject: Modification of Ferret 6, Jan. 17, 1945.



Air Force Historical Research Agency, SQ – PHOTO – 3 – SU – OP – S, Mar – Aug 1945 for discussion on Ferret 6 and weight.

44. Headquarters, XXI BC. Central Pacific Newsletter No. 9, May 4, 1945; Headquarters, XXI BC. Radar, RCM and Radio Newsletter No. 11, May 28, 1945. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945. August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala.

45. Countermeasures Analysis Center, Headquarters Strategic Air Forces Pacific Ocean Area. Report No. 1 to Assistant Director, Section 22, GHQ, SWPA, APO 500, Mar. 29, 1945. Air Force Historical Research Agency, SQ – PHOTO – 3 – SU – OP – S, Mar – Aug 1945.

46. Headquarters, XXI BC. Central Pacific Newsletter No. 1, Dec. 27, 1944. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945, August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala.

47. Office of the Air Communications, Headquarters United States Army Strategic Air Forces. Summary of RCM Activities in XXI Bomber Command, Period Dec. 18, 1944 to March 31, 1945, pp. 9-11. Air Force Historical Research Agency, 703.907

48. Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field. Dec. 8, 1944. Subject: Modification of B-24J Airplane on Project 96974-S to C-1 Ferret. 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45 Folder, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives

49. Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field. Mar. 28, 1945. Subject: Modification of B-24 Ferret Type Aircraft; Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field. Apr. 14, 1945. Subject: Modification of B-24 Ferret Type Aircraft; both in Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

50. Office of the Communications Officer, Headquarters, XXI BC. Memorandum to Deputy Chief of Staff for Operations, subject: RCM Ferret Aircraft, dated Feb. 25, 1945. Filed in Monograph II – RCM Reconnaissance and Countermeasures, Nov. 24, 1944 – Jun. 1, 1945. August 1945. Air Force Historical Research Agency, 762.041-2, Maxwell AFB, Ala.; Larry Tart and Robert Keefe, *The Price of Vigilance: Attacks on American Surveillance Flights* (New York: Ballantine Books, 2001), pp. 170-71.

51. Electronic Warfare Section, Office of the Director of Communications, Headquarters United States Army Strategic Air Forces. Memo to Chief, Electronics Section, HQ United States Army Strategic Air Forces, Office of the Director of Communications dated Jul. 19, 1945 with the topic “Conversion of RCM Ferret A/C for Communications Monitoring Operations. Air Force Historical Research Agency, SQ – PHOTO – 3 – SU – OP – S, Mar – Aug 1945; Larry Tart and Robert Keefe, *The Price of Vigilance: Attacks on American Surveillance Flights* (New York: Ballantine Books, 2001), pp. 170-171.

52. Air Technical Service Command Technical Instruction TI-2024, Addendum 14, Dec. 12, 44 – located in Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives

53. Air Technical Service Command Technical Instruction TI-2024, Addendum 36, Feb. 21, 45 – located in Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

54. Director, AAF Air Technical Service Command, Wright Field. Memorandum to Commanding General, AAF Attn: AFTMA-2F/7. Jan. 13, 1945. Subject: Ferret Project – DP-516 – Report 2. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

55. Holley, Irving B. *Buying Aircraft: Material Procurement for the Army Air Forces*, (Wash., D.C.:Government Printing Office, 1989), pp. 529-33.

56. Army Air Forces Technical Service Command (Procurement Division). Memorandum to the Army Air Forces Plant Representative, United-Cheyenne Modification Center. Mar. 10, 1945. Subject: Ferret Modification. Ferret Airplane decimal 452.1 Folder, Box 2697, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

57. Assistant Chief of Air Staff, Materials and Services. Memorandum to Director, AAF Air Technical Service Command, Wright Field. May 7, 1945. Subject: Revision of Equipment for B-24 Radar Ferrets. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

58. Air Technical Service Command Technical Instruction TI-2024, Addendum 66, May 19 1945; Air Technical Service Command Technical Instruction TI-2024, Addendum 72, May 28, 1945; both located in Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

59. Individual Aircraft Data Card for 44-51802, 44-51356, AFHRA.

60. 20th Combat Mapping Squadron. Unit Historical Report, August 1945. n.d., p. 18. Air Force Historical Research Agency, Sq-photo-20-hi, Aug 45, Maxwell AFB, Ala.

61. Wesley Craven and James Cate, *The Army Air Forces in World War II, Vol. Five* (Chicago: The University of Chicago Press, 1953), pp. 694-95.

62. Assistant Chief of Air Staff, Operations, Commitments and Requirements. Memorandum to Assistant Chief of Air Staff, Operations, Commitments and Requirements, Commitments Division. Feb. 18, 1945. Subject: Ferret Aircraft for the 1st Photo Reconnaissance Squadron, VH. Air Force Historical Research Agency, 143.03-2.

63. 1st Photographic Reconnaissance Squadron (VH). Unit Historical Report, June 1945. n.d.. Air Force Historical Research Agency, Sq-photo-1-hi, Jun 45, Maxwell AFB, Ala.

64. Assistant Chief of Air Staff, AS-4. Memorandum to Commanding General, Air Technical Service Command, Wright Field. Aug. 29, 1945. Subject: Radar Ferret Modifications. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

65. Radar No. 10, p. 10.

66. Engineering Division, ATSC. Memorandum to Commanding General, AAF Center, Orlando, FL. Dec. 5, 1945. Subject: Ferret C-1 Installation. Folder 452.1 – CONSOLIDATED B-24 FERRET 1943-44-45, Box 2713, Entry – Sarah Clark (Central Decimal File), RG 342, National Archives.

# *Aerial Reconnaissance, the Press, and*





# *and American Foreign Policy, 1950-1954*



John T. Farquhar

(Overleaf) Frontview of an RB-50 from the 55th Strategic Reconnaissance Wing, Ramey AFB, Puerto Rico, circa 1954. (Photo courtesy of the author.)

## AMERICAN STRATEGIC AERIAL RECONNAISSANCE EMERGED AS A SIGNIFICANT FACTOR INFLUENCING U.S.-SOVIET TENSIONS

On April 8, 1950, the Soviets removed the shroud of secrecy surrounding the U.S. strategic aerial reconnaissance program. Soviet fighters shot down an unarmed Navy PB4Y Privateer patrol plane with a crew of ten men over the Baltic Sea. Three days later, Soviet Foreign Minister Andrei Y. Vishinsky handed U.S. Ambassador Alan G. Kirk a note of protest against a “gross violation” of international law, claiming that an American B-29 type aircraft first opened fire on Soviet planes over Soviet territory.<sup>1</sup> In his telegram to Secretary of State Dean Acheson, Ambassador Kirk observed, “Vishinsky’s manner was serious but not aggressive nor antagonistic . . . recommend publicity on our side be avoided or if unavoidable, minimized.”<sup>2</sup> Nevertheless, the lid was off. The highly classified aerial reconnaissance flights by the U.S. Air Force and Navy begun in the late 1940s were exposed to the American public.<sup>3</sup> By focusing on the U.S. press coverage of a series of aerial incidents in the early Cold War (1950-1954), American strategic aerial reconnaissance emerged as a significant factor influencing U.S.-Soviet tensions creating a “cycle of hostility” that shaped perceptions and foreign policy.<sup>4</sup>

Although intended primarily as a means to provide leaders with intelligence information for threat assessment and war planning, the very nature of aerial reconnaissance whether peripheral electronic intelligence or overhead photographic flights shaped U.S.-Soviet relations during the Cold War. Throughout the early 1950s, a “cycle of hostility” sparked by American reconnaissance probes limited diplomatic flexibility. A consistent Soviet defensive reaction to U.S. reconnaissance patrols, regardless of location, cost American lives and increased superpower tension. Grabbing headlines, the loss of U.S. reconnaissance aircraft and other international incidents galvanized public opposition to diplomatic overtures. More than a mere tool of policy, aerial reconnaissance helped shape the strategic culture of the Cold War. The “cycle of hostility” may be characterized:

*Prompted by American mistrust and fear of Communist intentions, reconnaissance flights aroused Soviet worries of capitalist encirclement and inspired aggressive defensive measures.*

*When incidents resulted in American dead, sensational headlines seized popular attention and stirred public outrage.*

*Reinforcing perceptions of implacable Soviet hostility, shoot downs justified anti-Communism that marked the Cold War.*

*In turn, the increased tension fueled further intelligence concerns, which led to additional reconnaissance flights, continuing the “cycle of hostility.”*

Following the Baltic incident, Admiral Forrest Sherman, Chief of Naval Operations, reported the results of a Navy investigation: an unarmed Navy patrol plane, not a B-29 as the Soviets claimed, departed Wiesbaden, Germany at 10:31 Greenwich Mean Time on a “properly scheduled flight pursuant to directives of the Commander in Chief, U.S. Naval Forces, Eastern Atlantic and Mediterranean, for purposes previously approved by the Chief of Naval Operations.” This cryptic phrase is significant because many sorties of the early ferret program were conducted under theater or service authority without specific Presidential authorization. As a result, even this official inquiry dodged questions concerning the purpose of the flight. Admiral Sherman added that standing orders required U.S. Navy aircraft to “make no approaches closer than 20 miles to any shore of the USSR, its possessions or its satellites.” Verifying that the aircraft was unarmed, Admiral Sherman concluded:

*A relatively slow unarmed patrol plane could not have attacked a Russian fighter and the Soviet note is untrue in that regard. It is probably untrue also with respect to the location of the incident. It is not likely that competent personnel would overfly Soviet occupied Latvia, nor that Soviet fighters would break off action over land under such circumstances.<sup>5</sup>*

The Soviet attack launched a wave of frenzied rhetoric by outraged politicians and vigilant newsmen. For example, the *New York Herald Tribune* announced a “proposal by the House Democratic leader, Representative John W. McCormack of Massachusetts, that the United States should sever diplomatic relations with the Soviet Union, or, perhaps recall Ambassador Kirk.” Not to be outdone, Representative Carl Vinson compared the incident to the Japanese attack on the U.S.S. *Panay* in 1937: “Here, in the same pattern, in the same manner, for the same purpose, with the same ruthlessness, with the same contempt of life, for democratic institutions, for international law, for decency – a barbaric attack is made on an unarmed[,] defenseless American aircraft.” Reminding Americans of their unpreparedness for the last war, Vinson called for increased spending for military aircraft to “maintain sufficient force to insure Russian respect.”<sup>6</sup>

Within a few weeks, probing reporters uncovered the plane’s secret mission. In a *Washington Post* article, Marquis Childs revealed that “the Russians believed that the American plane was carrying a recently developed type of reconnaissance equipment. . . . [making] it possible to do reconnaissance at much greater distances than has ever more

*Dr. John T. Farquhar graduated from the Air Force Academy and flew as a navigator in the RC-135 reconnaissance aircraft with the Strategic Air Command. With a Master’s Degree in U.S. Diplomatic History from Creighton University and a Ph.D. in American Military History from The Ohio State University, Dr. Farquhar has taught courses in military history, air power, and military & strategic studies at the United States Air Force Academy. In 2014, he published “Arctic Linchpin: The Polar Concept in American Air Atomic Strategy, 1946-1948.”*



## THE 1950 BALTIC INCIDENT THRUST AERIAL RECONNAIS- SANCE INTO THE NATIONAL LIMELIGHT

## THE 1950 BALTIC INCIDENT LED PRESIDENT TRUMAN TO ORDER A REVIEW OF U.S. AERIAL RECONNAIS- SANCE



been possible.<sup>7</sup> Columnist Drew Pearson claimed the Navy's posted list of crew members, showing the presence of electronics specialists, broadcast the patrol plane's mission to the Russians before its takeoff: "They knew the plane was equipped with high-powered radar and electronics equipment that could watch amphibian maneuvers and the flight of rockets over the Russians' most secret rocket-test-ground—the Baltic."<sup>8</sup>

In his *Washington Post* column, Walter Lippman speculated that the Soviets destroyed the Navy Privateer as a deliberate act of policy. He believed the Soviets set a trap for the patrol plane: "... Soviet intelligence had advance notice that the plane would fly a course over the Baltic Sea, that though it was known to be unarmed the Soviet intelligence believed it carried important electronic equipment, and that orders were given to the Soviet fighter command to intercept it, to capture it if possible, and failing that, to shoot it down."<sup>9</sup> The fact that no wreckage could be produced over Soviet territory disproved the Russian claim of violated territorial sovereignty. Lippman questioned Soviet motives for decorating the fighter pilots credited for the kill: "The ostentatious award of 'The Order of the Red Banner' to four Soviet flying officers was plainly intended to advertise the exploit. The award is particularly significant, it seems to me, because these officers did not in fact succeed in doing what, ... they tried to do. What then did these fighters do that entitled them to special honors and decorations?"<sup>10</sup> Answering his question, Lippman postulated that the incident served a twofold purpose: "One, which probably failed, was to capture a plane with valuable military secrets; the other was to demonstrate to the world that the Soviet air

defenses are able to repel American strategic air power." Hence, in Lippman's view, the Baltic shoot-down suggested broader policy implications: "upon making their own territory invulnerable to American airpower. ... the Red [A]rmy would be virtually unopposed around the periphery of the Soviet Union. ... to convince the Russian people and also the people of Europe that the Soviet Union has achieved an air defense."<sup>11</sup>

Regardless of whether the columnists' speculation was correct, the 1950 Baltic incident thrust aerial reconnaissance into the national limelight. Largely caught unaware, President Truman called for a thirty-day suspension of flights until matters could be properly assessed. The political volatility of the missions had to be weighed against the need for intelligence, especially as concern over the prospect of a Soviet surprise attack increased. As Chairman of the Joint Chiefs of Staff General Omar Bradley stated in a memorandum to the Secretary of Defense, "It is recognized that there is a risk of repetition of such incidents upon resumption of these flights, but it is felt that there would be more serious disadvantages occurring to the United States if the cessation of these operations were to be extended over an excessively long period."<sup>12</sup>

The 1950 Baltic incident led President Truman to order a review of U.S. aerial reconnaissance. On May 5, 1950, the Joint Chiefs of Staff formalized the goals and operating procedures of the ferret missions, now called the Special Electronic Airborne Search Project (SESP). In a memorandum to the Secretary of Defense, later briefed to the President, General Bradley outlined the program. The aim of the SESP was to obtain "the maximum amount of intelligence concerning foreign electronic develop-

Although similar to the famous B-29 of World War II, the Boeing RB-50 featured upgraded engines resulting in increased payload and range. (Photo courtesy of the author.)



## PRESIDENT TRUMAN'S APPROVAL OF THE SPECIAL ELECTRONIC AIRBORNE SEARCH PROGRAM PROVED TO BE A LAND-MARK IN THE HISTORY OF AERIAL RECONNAISSANCE

ments as a safeguard to national defense." The Joint Chiefs of Staff scheduled the missions to be flown along the borders of the Soviet Union to locate and analyze enemy air defenses. These flights would be conducted under strict operating procedures which included:

*Flights will not be made closer than twenty miles to the USSR or . . . satellite controlled territory.*

*Flights will not deviate from or alter planned courses for other than reasons of safety.*

*Aircraft engaged in these operations over routes normally flown by unarmed transport-type aircraft, i.e., the land masses of the Allied Occupied Zones and the Berlin and Vienna corridors, will continue to operate with or without armament. [The President scribbled "which?" on the copy forwarded to him. A later memo explained that the statement meant to "permit operations of either armed or unarmed aircraft dependent upon whether the armed or unarmed type is available at the particular time."]*

*Aircraft engaged in these operations over all other routes adjacent to the USSR or to USSR-or satellite-controlled territory will be armed and instructed to shoot in self-defense. ["good sense, it seems to me. H. S. T."]<sup>13</sup>*

President Truman's approval of the Special Electronic Airborne Search Program proved to be a landmark in the history of aerial reconnaissance. No longer would ferret operations be conducted ad hoc by the military services; from 1950 onward, reconnaissance operations attracted Presidential attention and played a significant role in shaping U.S. foreign policy. The shock of the 1949 Soviet atomic explosion and fears of expanding Soviet military capability overpowered reservations of possible political consequences. As the Baltic incident showed, American efforts to gather intelligence risked violent reprisal by the Soviet Union which, in turn, captured headlines and aroused public opinion. The average American cared little about elec-

tronic intelligence or ferret operations; but, apparently "the Communists" murdered ten American boys in an unarmed plane. The death of the Navy fliers confirmed the arguments of those advocating vigilance in the Cold War. Thus, Truman's approval of the formal guidelines for aerial reconnaissance not only established the framework for operations to be conducted, but set the stage for an era of aerial confrontation.

The outbreak of the Korean War reinforced the need for a coordinated program for U.S. strategic aerial reconnaissance. Building on the Special Electronic Airborne Search Program, regular peripheral reconnaissance flights along Soviet borders continued worldwide. With the experience of the Baltic Incident, American leaders understood the potential diplomatic consequences of "ferret" flights. Nevertheless, intelligence needs dictated further missions. As later events proved, aircraft incidents of all types played a significant role in U.S.-Soviet relations. As the Korean War-related reconnaissance in the Pacific developed quietly, an unrelated incident shifted attention back to Europe.

On November 20, 1951, the United States Embassy in Belgrade, Yugoslavia, announced an American C-47 transport was missing after having been fired on by Hungarian and Romanian border guards. The embassy spokesman explained that the flight carried diplomatic cargo destined for Yugoslavia and a crew of four. Apparently, the missing plane had mistaken the Drava River, which flows close to the borders of Hungary and Romania, for the Sava River, which marked the air corridor to Belgrade.<sup>14</sup>

The missing plane triggered another outburst in the American press. Recalling the Baltic Incident, a *New York Times* editorial blasted the border guards' actions: "Behind the iron curtain is a jungle world into which one ventures at his own risk . . . the Hungarian and Rumanian governments appear to believe that the "illegal entry" into their territory of a lost plane is sufficient cause to blaze away."<sup>15</sup>



COMBINING  
WITH THE  
HOSTILITY  
PRODUCED  
BY THE  
KOREAN  
WAR, THE  
C-47 INCI-  
DENT  
STRAINED  
U.S.-SOVIET  
RELATIONS

THE CYCLE  
OF HOSTILITY  
FEATURED IN  
STRATEGIC  
AERIAL  
RECONNAIS-  
SANCE  
HELPED  
FORM THE  
STRATEGIC  
CULTURE OF  
THE EARLY  
COLD WAR

Adding to the clamor, two weeks later, the Soviet Union announced that its air force had forced down the unarmed cargo plane and accused the crew of planning to pick up “spies and saboteurs.” The Soviets cited the plane’s extra parachutes and equipment, including a two-way radio, as evidence.<sup>16</sup> This charge unleashed a media attack: “The current furor over the American C-47 plane forced to land in Hungary provides an instructive case history of Soviet paranoia and propaganda skill. It is a classic example of how the Kremlin can make a mountain out of a molehill, even when working with the most meager materials.”<sup>17</sup>

Responding to the press attention, the Truman Administration acted swiftly, attempting to gain the fliers release through diplomatic pressure. The President ordered the Hungarian consulates in New York and Cleveland closed and banned private travel to the country.<sup>18</sup> Legislatively, Truman asked Congress to pass a \$100 million Mutual Security Act to aid “selected persons residing in Soviet bloc states or refugees who wanted to form armed units” in opposition to Communism.<sup>19</sup>

Combining with the hostility produced by the Korean War, the C-47 incident strained U.S.-Soviet relations. The incident aggravated Communist suspicions of Western spying and capitalist encirclement. Soviet leaders believed the lost C-47 was spying regardless of its actual mission. American officials pointed out that the plane bore standard U.S. military markings and carried a crew of regular Air Force personnel. Regardless, the aerial incidents demonstrated that the Soviet Air Force would vigorously defend its borders from any perceived intruder, regardless of actual location or mission.

By late December, the Hungarians released the four crewmen held captive. The incident disappeared from the front pages, but the cycle of hostility had started. The press alerted the American public to the dangers of air travel near the Soviet bloc and emphasized the brutal hostility of the Communist foe. On the other hand, sensitive of their territorial sovereignty, Eastern bloc nations insisted upon the right to down aircraft penetrating their airspace without authorization.

The cycle of hostility featured in strategic aerial reconnaissance helped form the strategic culture of the early Cold War. In *Modern Strategy*, Colin S. Gray explained that strategic culture provided the context and meaning of events. More specifically, he discussed that strategic culture comprised the “ideas, attitudes, traditions, habits of mind, and preferred methods of operation” that marked a specific geographically based security community.<sup>20</sup> In this case, drawing upon fears of an atomic Pearl Harbor, American military and political leaders sought reassurance through aerial reconnaissance. Ironically, similar fears of surprise attack shaped Soviet strategic culture during the early Cold War. Senior Soviet leaders remembered German aerial reconnaissance on the eve of Hitler’s invasion of the USSR in 1941. Hence, each belligerent viewed the other as hostile, dangerous, and aggressive. The

series of aerial incidents reinforced perceptions and demonstrated the intentions of the enemy.

On October 9, 1952, the cycle of hostility continued when the front page of the *New York Times* announced “B-29 LOST OVER SOVIET KURILES.” The article explained that a B-29 Superfortress, carrying a crew of eight, disappeared after “radar equipment had picked up an unidentified plane approaching it from the direction of the Russian-held Kurile Islands.” The attack occurred eight miles northwest of Nemuro, a city on the Japanese island of Hokkaido, over Japanese territorial waters about fifteen miles from the international border two days prior.

Consistent with the pattern of events forming in such incidents, the United States protested the attacks as “uncivilized.”<sup>21</sup> In its defense, the Soviets claimed the B-29 had violated its borders and had opened fire on Soviet fighters. According to a Soviet note of October 12, 1952, the incident occurred near Soviet-occupied Yuri island in the Kurile chain.<sup>22</sup> Rejecting the Russian explanation, the State Department demanded repatriation of any survivors and monetary compensation for the aircraft loss. In addition, the U.S. Government spurned the Soviet account of events: “By its calculated misrepresentation of the facts . . . the Soviet government has sought, not for the first time, to evade responsibility for a wanton and unjustifiable attack carried out on an undefended plane by fighter planes of its air force.”<sup>23</sup>

Joining the war of rhetoric, American newsmen interpreted the overall impact of the B-29 incident of October 1952 upon the Cold War. Noting the Kremlin’s demand for the recall of Ambassador George F. Kennan, a *New York Times* editorial viewed the aircraft incident in grave terms:

*Meanwhile, the attacks on the planes are justified with the now familiar charge . . . that the American airplanes violated Soviet territory and fired first. These accusations are part of a Soviet policy of mendacity, but the actions themselves, like the Korean War, are part and parcel of the Kremlin’s cold and not so cold war against the West in general and the United States in particular. . . . But the purpose of the diplomacy is obvious. It is to lower American prestige in the eyes of the world, to demonstrate that the United States can be pushed around with impunity, and thereby break up the solidarity of the free world.*<sup>24</sup>

Likewise, reporter Hanson W. Baldwin looked at the strategic significance of the events:

*The Russians have been trying by threat, fear and suggestion to make the Baltic their “Mare Nostrum” . . . . In the Kuriles, the Russians have simply preempted some former Japanese islands to which they have no legal right and are acting on the basis that possession is nine-tenths of the law. Their action in shooting down our B-29 on Oct. 7 can be construed as intended to enforce this claim.*

*But the fact remains that Russia is steadily pulling down the Iron Curtain further and further*

RB-50 aircrew's preflight equipment inspection.  
(Photo courtesy of the author.)



*all over the world . . . This is, of course, a manifestation of the communist psychology of suspicion and fear. It could well be and probably is defensive in character, defensive militarily, and defensive against ideas from the West. But it could also . . . mask offensive preparations.*<sup>25</sup>

Adding to its impact upon Cold War tension, the October 9th shoot down occurred at a key moment in U.S. domestic politics. The news of the attack shared the front page with the intensifying Eisenhower-Stevenson presidential race. Cold War issues and Korea dominated the campaign and the killing of American airmen in direct clashes with the Soviets raised the prospect of a dreaded general war. In some ways, the October B-29 incident called attention to General Eisenhower's image as a leader strong enough to face the Russians, yet a man devoted to peace. In all probability, the flare up of Cold War violence helped Eisenhower's campaign.

On January 18, 1953, the day before Eisenhower's inauguration, Communist Chinese anti-aircraft guns downed a U.S. Navy P2V Neptune near the port of Swatow in southern China.<sup>26</sup> Adding to the disaster, a Navy PBM Mariner sea plane crashed on take-off after picking up ten of the Neptune's survivors. Only ten of the twenty-one men on board the two airplanes survived. The Neptune's loss marked the first time an American reconnaissance plane was shot down in the South China Sea since President Truman's decision to patrol the Formosa Strait on June 27, 1950.<sup>27</sup>

The hoopla surrounding the new President's inaugural ceremony diverted press attention from the incident in the South China Sea. Newsmen cared more for the color of Eisenhower's coat (dark blue) and whether he would wear a top hat (he reviewed the parade bareheaded) than for what were becoming routine acts of aerial "aggression."<sup>28</sup> In addition, the American diplomatic response was

mutated largely due to the office changeovers leaving a relative power vacuum until the newcomers learned their positions. As a result, the Navy continued its patrols and the incident passed quietly.

Paralleling the change in U.S. administrations, Joseph Stalin's death rocked the Communist world. Since his assumption of power in 1927, Stalin's iron hand had dominated Russian life. From a Soviet point of view, his warnings of the danger of capitalist encirclement and his emphasis on the inevitable conflict between capitalism and communism proved sound, as evidenced by the titanic struggle against Hitler. Therefore, Stalin's conviction to maintain huge military forces remained unopposed until now. In many ways, American reconnaissance missions justified Stalin's emphasis on the need for vigilance. When Soviet leaders questioned the purpose of American intelligence flights, the answer seemed obvious: these seemingly harmless, unarmed craft explored routes for nuclear-armed American bombers.

The power vacuum presented by the death of a leader undisputed for twenty-four years posed profound problems. In addition to the rivalry of various power blocs and the indecision surrounding who would eventually rule, Soviet foreign policy faced a dilemma. At the heart of the matter lay the prospect of nuclear war. Knowing firsthand the devastation and suffering caused by all-out conventional war, Communist leaders understood the potential destruction of nuclear conflict. They dreaded the thought of the annihilation of a state so many had sacrificed to save. Furthermore, the burden of a huge military establishment strained to the limit an economy still ravaged from the last war.

As a result, the next generation of policy makers sincerely wished to avoid war and reduce military spending; the question was how. To show weakness in front of the capitalist foe risked strategic losses, and perhaps more important, threatened political defeat in the Byzantine-like power strug-

## THE OCTOBER B-29 INCI- DENT CALLED ATTENTION TO GENERAL EISEN- HOWER'S IMAGE AS A LEADER STRONG ENOUGH TO FACE THE RUSSIANS



## TWO AERIAL INCIDENTS CHALLENGED SOVIET LEADERS

## DESPITE THE CONCILIATORY TONE OF AMERICAN AND RUSSIAN LEADERS, THE U.S. MEDIA INTERPRETED THE SITUATION AS ONE IN WHICH ACTIONS SPOKE LOUDER THAN WORDS

gles of the Kremlin. Men who had admired Stalin's strength in dealing with the West still held considerable power in the Party hierarchy. Nevertheless, new Soviet Premier Georgi Malenkov expressed hope of peaceful "coexistence and competition" during his address at Stalin's funeral.<sup>29</sup>

Within a week, two aerial incidents challenged Soviet leaders. On March 10, 1953, two Czechoslovakian MiG-15s shot down an American F-84 Thunderjet over the United States zone in Germany. The plane crashed near the Bavarian village of Falkenstein, twenty-three miles from the Czech border.<sup>30</sup> Two days later, Soviet fighters downed an RAF Lincoln bomber that strayed, according to the Soviet claim, from the Berlin air corridor. Seven British airmen died in the incident.<sup>31</sup>

The Soviet Union's conciliatory response to British and American protests surprised Western observers. In a note from General Vassily T. Chuikov, chairman of the Soviet Control Commission in Germany, the Soviet Government expressed "regret" over the incident and suggested a Soviet-British conference in Berlin to avoid further "misunderstandings."<sup>32</sup> By the end of March, the two sides conducted a secret meeting to eliminate future disputes of which little is known except the Soviet tone was unusually mild.<sup>33</sup> Although the Russians maintained a posture of righteous innocence in both incidents, their expression of regret marked the first move to lessen aerial tension and break the cycle of hostility.

Matching the Soviet tone, President Eisenhower assumed a policy of "conciliation plus strength" in response to the shoot downs. At a press conference on March 19th, the President delivered the mildest rebuke of Soviet actions since the start of the Korean War. Although the attacks on Allied aircraft were serious, he said, the Administration noticed no new pattern of hostility in them. Moreover, noting Malenkov's statements that unresolved problems between the two superpowers could be resolved through negotiations, Eisenhower remarked that the new Soviet leaders would never be met less than half-way.<sup>34</sup>

Despite the conciliatory tone of American and Russian leaders, the U.S. media interpreted the situation as one in which actions spoke louder than words. Many writers perceived Malenkov's talk of peace as a ruse to mask Communist hostility. For example, C. L. Sulzberger explained that Malenkov's talk of peace after the attack on American and British aircraft offered a useful lesson for the Allies: "It served as a brutal reminder of the overriding reality of our times—that the Soviet menace continues, regardless of which leader rides the juggernaut."<sup>35</sup> Refusing to be lulled into complacency, the *New York Times* called for increased vigilance: "For the latest attacks are no isolated incidents, . . . At the very least, the attacks demonstrated the burning hatred inculcated into communist airman that is bound to lead to such incidents; at the very worst, they must be regarded as manifestations of a deliberate policy" to intimidate west-

ern Germany on the eve of voting to ratify the European Defense Community.<sup>36</sup>

Continuing a skeptical, unyielding line of thought, some newspapers interpreted the incidents as a Soviet signal, "Malenkov, . . . was saying to the West in effect: the new regime is solid, tough and fissureless. The satellites are loyal to Moscow, and will take their orders . . . witness the attack by Czech planes."<sup>37</sup>

Even though American strategic reconnaissance aircraft were not involved in these air confrontations, the net effect of the aerial violence limited the President's response to Malenkov's peace overtures. Although Eisenhower was personally wary of "Russians bearing gifts," adverse public opinion prevented him from exploring options even if he had wanted. With American troops still fighting and dying in Korea and U.S. fliers subject to unprovoked attacks, a move by the President to achieve détente would have been political suicide.

A Soviet attack on a SAC RB-50 reconnaissance aircraft on March 15, 1953, dashed conciliation hopes of the superpowers. Occurring only a week after the RAF Lincoln shoot down, the RB-50's defensive fire warded off a MiG-15 after the jet's initial firing pass. According to an Air Force spokesman, the 55th Strategic Reconnaissance Wing (SRW) aircraft was engaged in a "weather reconnaissance" flight over international waters near Siberia. Sources placed the plane twenty-five miles off the coast of Kamchatka, about 100 miles northeast of Petropavlovsk.<sup>38</sup>

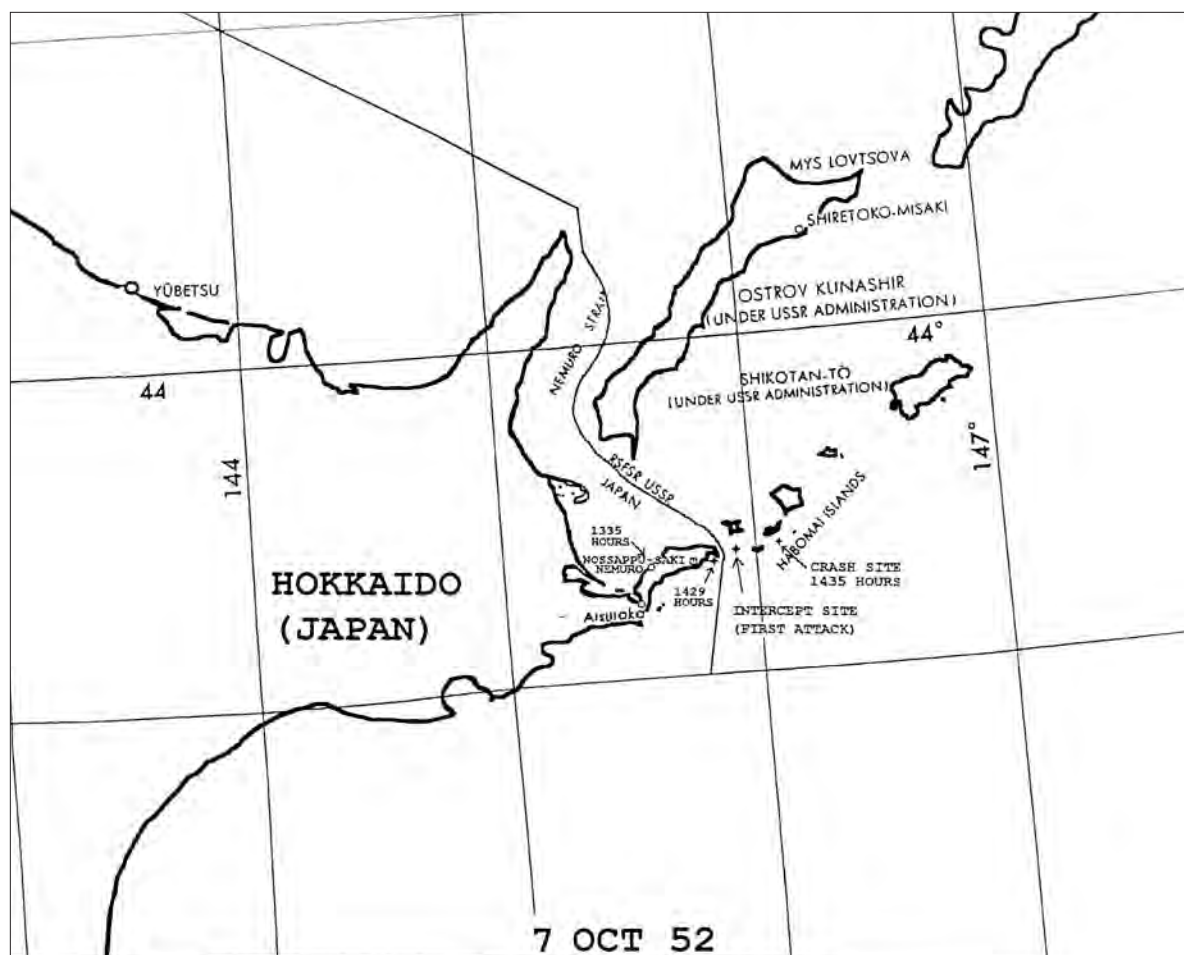
In response to a "vigorous" U.S. protest note, the Soviet Union charged the American government with conducting "premeditated" violations of Soviet territory.<sup>39</sup> Nine days after the incident, the Soviet government released the following note:

*In accordance with verified data, it has been established that an American bomber of the B-29 type violated on the 15 of March at 11:57 time in the district of Cape Krestovoi [the southern part of the Kamchatka Peninsula] the state frontier of the U.S.S.R. and flew over the territory of Kamchatka up to seventy kilometers . . . At 12:26 the American aircraft B-29 type appeared again and violated the state frontier of the U.S.S.R. northeast of the town of Petropavlovsk in Kamchatka in the area of the village of Zhupanovo.*

*Good weather, which in both cases enabled the crew to carry out visual reconnaissance on a large scale, excluded the possibility of loss of orientation and confirmed that both cases . . . were clearly of a premeditated character.*<sup>40</sup>

The U.S. Air Force countered the Soviet claim with a detailed explanation of the aircraft's location and mission. An official spokesman announced that the aircraft's position was 54 degrees 2 minutes North latitude, 161 degrees 4 minutes East longitude when attacked, roughly twenty-five miles off the coast of Kamchatka.<sup>41</sup> The mission originated at Eielson AFB, Alaska, and conducted a routine weather reconnaissance mission to enhance the alert sta-

Map of B-29 attack over the Kurile Islands. (Task Force Russia files contained in electronic archives at the Library of Congress at [lcweb2.loc.gov/tfd/tfr/](http://lcweb2.loc.gov/tfd/tfr/).)



**DESPITE  
THESE  
VOICES OF  
PROTEST IN  
AMERICAN  
DOMESTIC  
POLITICS,  
THE CYCLE  
OF HOSTILITY  
CONTINUED  
UNABATED**

tus of SAC's heavy bombers. According to Air Force policy, these daily weather flights were to approach the Soviet Union no closer than twenty-five miles.<sup>42</sup>

In a move that surprised many, Senator Ralph C. Flanders, Republican of Vermont, labeled the Air Force explanation as "preposterous." He charged the Air Force with "waging psychological warfare with the people of the United States." Flanders reasoned, "there is no need to go within twenty-five miles of Kamchatka to look for weather. There is just as much weather fifty or 100 miles out." According to his information, the reconnaissance bomber was not scouting for weather; this was a cover for another "useful" mission. Flanders summed up his criticism:

*The serious thing about the incident is the false report of the Air Force. . . . It tended and was probably intended to influence public opinion by making the incident into an act of aggression. In publishing this false report the Air Force has been guilty, in effect of waging psychological warfare on the people of the United States.*<sup>43</sup>

Adding to this rebuke of Air Force actions, Senator Warren G. Magnuson, Democrat from Washington, questioned the aircraft's location. Why was the RB-50 so far away from American territory? Granted, there could be no excuse for the MiG's firing, but since the SAC aircraft was 600 miles west of the United States, he could understand the Soviet reaction.<sup>44</sup>

Despite these voices of protest in American domestic politics, the cycle of hostility continued unabated. Reports of Russian reconnaissance overflights of Alaska and Canada combined with the aerial incidents to justify even more extensive aerial surveillance.<sup>45</sup> The frequent Soviet shoot downs proved Communist hostility, whereas Western patrols increased Russian fears. Consequently, even though a ceasefire in Korea removed one major source of East-West friction, this cycle of hostility caused by reconnaissance incidents prevented other forms of détente.

On July 29, 1953, two days after the ending of hostilities in Korea, Russian fighters downed an RB-50 of the 343rd Strategic Reconnaissance Squadron (SRS) over the Sea of Japan, about ninety miles southeast of Vladivostok.<sup>46</sup> Attached to the 91st SRS at Yokota AB, Japan, the RB-50 conducted a "routine" electronic reconnaissance mission along the Soviet coast continuing the practice established during the Korean War.<sup>47</sup> According to Captain John E. Roche, the copilot and lone survivor of the crew of sixteen, the Soviets attacked the plane without warning from the rear. Although the RB-50's gunners fired a few bursts in self-defense, the MiGs raked the slower reconnaissance bomber with cannon fire causing it to burst into flames.<sup>48</sup>

The Soviet Government announced that "a four-motored bomber of the type B-50" violated the Soviet coast twice, at Cape Gamova and then at Askold Island, near Vladivostok. When challenged



by two Soviet fighters on defensive patrol, the American intruder opened fire, seriously damaging one of the planes. As a result, the remaining Russian interceptor counter attacked and the American bomber “disappeared in the direction of the sea.”<sup>49</sup>

Rejecting Ambassador Charles E. Bohlen’s note of protest, the Soviets diverted attention from the RB-50 incident. They claimed American fighters “invaded” the airspace of Communist China in the last hours of the Korean conflict and shot down a Soviet passenger plane, killing the six crew members and fifteen passengers.<sup>50</sup> Immediately, U.S. analysts linked the two incidents, speculating that the Soviets downed the RB-50 in revenge or simply manufactured the story as a ploy to shift public attention from their act.<sup>51</sup>

Despite the Soviet charge, American newsmen pressed their attack on Communist brutality. A *New York Times* editorial condemned the Russian protest as a mere propaganda move:

*All Soviet history shows Moscow’s belief that a good attack is the best defense—in the diplomatic as well as the military arena. That this maxim is again being applied seems the most likely explanation for the Soviet charge . . . that American planes shot down a Russian transport flying over Chinese territory. One can hardly blame Moscow for preferring to press this charge rather than defend the cold-blooded murder committed last week by the Soviet pilots who shot down an American B-50 plane over the Pacific Ocean forty miles from Soviet soil.*<sup>52</sup>

Not all Americans blamed the Soviets for violent aerial confrontations. Some questioned whether the U.S. provoked Soviet hostility. Others doubted the wisdom of flying “routine” missions near Communist territory as shown by a letter to the editor of the *New York Times*:

*In regard to the all-too-frequent incidents in which American planes are shot down by Russian airmen, hasn’t it happened enough in the past few years for the United States to realize that there is a possibility of the same thing happening again and again? . . . I can see no point in sending a plane on a training flight near enough to Soviet territory to be in danger of attack. This policy apparently needlessly endangers the crew of such planes to say nothing of the ill-feeling and loss of prestige we generally suffer after such an incident.*<sup>53</sup>

Unfortunately, safety concerns were not paramount in an era of worry over Soviet military capability. Despite the mounting losses, policy makers sought security from surprise attack and technological breakthroughs.

Unfortunately, further aerial confrontations hampered Eisenhower’s attempt to moderate East-West tensions taking advantage of a window of opportunity made possible by Stalin’s death. Over the ten months following the Korean armistice, three more U.S. reconnaissance planes were inter-

cepted. The cycle of hostility continued; mistrust, provocation, self-righteousness, and further enmity characterized super power relations. Vigilant newsmen, concerned political leaders, concerned military commanders, and an aroused citizenry demanded that Eisenhower maintain an uncompromising position in the face of nascent Soviet peace overtures. They believed Soviet actions required toughness, regardless of Moscow’s peaceful words.

On September 4, 1954, just over a month after the incident in the South China Sea, the Russians downed a U.S. Navy P2V Neptune patrol plane over the Sea of Japan. Navy sources placed the attack over international waters forty-four miles off the coast of Siberia and 120 miles southeast of Vladivostok. An RB-50 coordinated the rescue of nine of the ten crew members. Claiming the Neptune was making a routine patrol flight from its base at Atsugi, Japan, the official statement did not elaborate upon the nature of the aircraft’s mission.<sup>54</sup>

Consistent with previous aerial confrontations, the two superpowers exchanged fiery, contradictory notes. The United States Government protested “this wanton and unprovoked attack on a United States Navy aircraft engaged in a peaceful mission over the high seas.” On the other hand, the Soviet note charged, “a twin-engine military aircraft of the Neptune type with identification marks of the United States Air Force violated the state frontier of the U.S.S.R. in the area of Cape Ostrovnoi, east of Port Nakhodka.”<sup>55</sup>

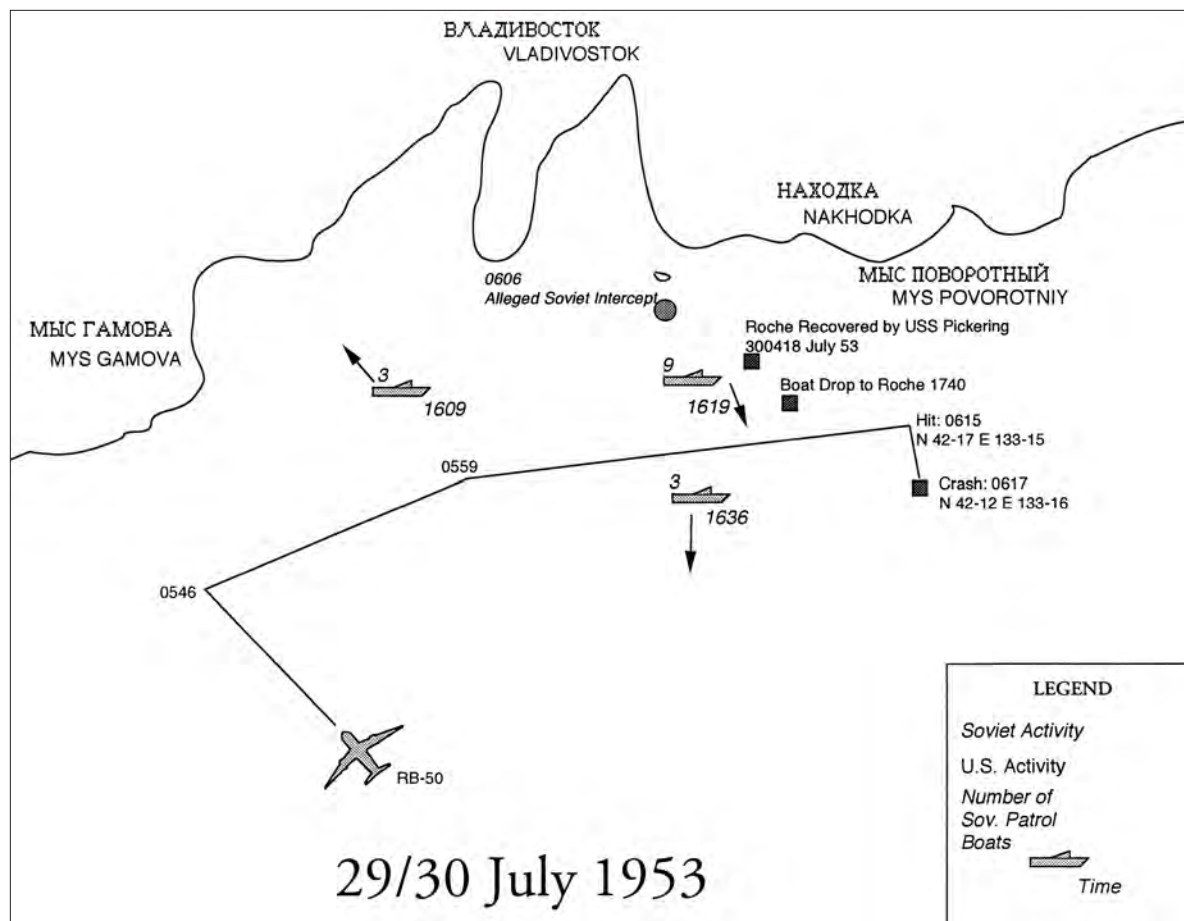
Along with the diplomatic exchange, American newsmen continued a hard line against Soviet barbarism and several U.S. senators called for harsh diplomatic measures. A powerful Republican, Senator William F. Knowland, insisted upon the U.S. breaking off diplomatic relations with the Soviets: “Just another note from our State Department to the Kremlin hierarchy will not impress these uncivilized rulers nor the Russian people . . . that this new attack upon an American plane confirms Communist arrogance and aggressiveness to the point where the breaking of diplomatic relations is justified.”<sup>56</sup>

Instead of severing ties, the Eisenhower Administration brought the matter before the United Nations Security Council. For the first time, the United States invoked Article 27, Chapter VI of the U.N. Charter calling for “Pacific Settlement of Disputes.” American leaders realized the Soviet Union could, and probably would, employ its veto if faced with an unfavorable decision; however, the U.S. believed that bringing the matter before the Security Council might influence the Russian response in future confrontations.<sup>57</sup> In his presentation, U.N. Ambassador Henry Cabot Lodge, Jr. emphasized the U.S. desire to settle the dispute peacefully and that the United States was prepared to negotiate “in good faith—face to face or through the International Court of Justice.”<sup>58</sup>

Although the U.N. presentation did little to resolve the problem, the American media praised Eisenhower’s moderate course of action. Breaking off diplomatic relations would gain little and lose

Map of RB-50 Shootdown near Vladivostok, July 29-30, 1953. (Task Force Russia files contained in electronic archives at the Library of Congress at [lcweb2.loc.gov/tfd/tfr/](http://lcweb2.loc.gov/tfd/tfr/).)

# IN SHARP CONTRAST TO THE HARSH OFFICIAL STATEMENTS, THE LEADERS OF THE TWO SUPER-POWERS MUTED THE CRISIS ATMOSPHERE



even the limited ability to observe the Soviets first hand. Moreover, the harsh move would worry non-aligned nations over the possibility that the United States might be preparing for war.<sup>59</sup> Additionally, Eisenhower's course of action in the U.N. appealed to America's belief in legal justice. Although most observers acknowledged that cases before the U.N. and the International Court of Justice would not accomplish anything in the short run, leaders hoped to influence future Soviet actions and to score points with neutral nations.<sup>60</sup>

A month later, another shoot down of an Air Force RB-29 stirred the already turbulent waters of East-West diplomacy. On November 7, 1954 (Tokyo time), two Soviet fighters fired on an RB-29 from the 91st SRS over Hokkaido Island, Japan. The crew bailed out as the burning bomber plunged to earth near the town of Kenebetsu. Nine of the ten crew members survived the jump, although one perished when his parachute lines became enmeshed. Based at Yokota Air Base, Japan, the RB-29 had been conducting a routine photo-mapping mission.<sup>61</sup>

The U.S. State Department launched another protest, asserting that the aircraft did not cross the MacArthur Line, the territorial demarcation between Hokkaido and the Kurile Islands. Supporting this claim, the Air Force located the crash site ten miles inland and about thirty miles west of the Nemuro Strait, which separates Hokkaido from the Soviet-held Habomai Islands.<sup>62</sup> Furthermore, the U.S. State Department backed Japan's claim to the Habomai Islands, despite the

presence of Soviet troops on them. Thus, even had the reconnaissance plane strayed off course, it had a legal right to be over the islands.<sup>63</sup>

The Soviet Union reacted in a predictable manner. Rejecting both the American assertion of the plane's position and the U.S. support of Japanese territorial sovereignty for the Habomai Islands, the Soviets lodged a "resolute" protest with the U.S. government. The Soviet note claimed a different sequence of events:

*According to established facts, on Nov. 7 this year at 13 hours and 20 minutes local time . . . a four-engined military aircraft of the B-29 type with identification marks of the U.S. Air Force violated the state border of the Soviet Union in the area of Tanfilyev Island (Kurile Islands) and continued to invade the airspace of the U.S.S.R. . . . the American aircraft was intercepted by Soviet fighters, . . . when the Soviet fighters approached, the American aircraft opened fire on them. In view of this unprovoked action of the American intruder, the Soviet aircraft were compelled to retaliate the fire after which the American aircraft left the air space of the Soviet Union and flew off in a southerly direction.*<sup>64</sup>

In sharp contrast to the harsh official statements, the leaders of the two superpowers muted the crisis atmosphere. President Eisenhower hoped to reduce tensions and persuade the Soviets to back his plan for an international pool of atomic energy resources.<sup>65</sup> Another wave of Cold War rhetoric





The Navy PB4Y-2 patrol plane was a single-tail version of the Consolidated B-24 Liberator.

**DESPITE THIS APPARENT THAW IN COLD WAR ATTITUDES, THE CYCLE OF HOSTILITY CONTINUED TO INFLUENCE U.S. FOREIGN POLICY**

threatened this proposal. Therefore, at his scheduled press conference, Eisenhower acknowledged that the boundary in question “was apparently not definitely defined”; he pointed out that the agreement with the Russians during the war failed to define the southern boundary of the Kuriles.<sup>66</sup> Consequently, although the President believed the United States was the aggrieved nation, he moderated the U.S. position in an effort to further the cause of peace.<sup>67</sup>

Matching Eisenhower’s tone, Soviet leaders adopted a non-belligerent stance. At a Moscow diplomatic reception, Soviet Premier Georgi M. Malenkov and First Secretary of the Politburo Nikita S. Khrushchev praised Eisenhower in glowing terms. Representative Victor Wickersham, a Democrat from Oklahoma, quoted Malenkov as saying, “We have great admiration for Eisenhower and we want to send through you to him and the American people our best wishes and desire to live in peace.” In addition, Wickersham relayed a similar statement from Khrushchev, who considered Ike “an honest soldier and true partner . . . we have got the most wonderful recollection of America as partner and friend in the fight against Hitler.”<sup>68</sup>

Despite this apparent thaw in Cold War attitudes, the cycle of hostility continued to influence U.S. foreign policy. Senator William F. Knowland resumed his attack on the mild U.S. response to Soviet aggression. He called for stronger measures and predicted more incidents if the United States “did not do more than merely send notes to Moscow.” Furthermore, he found “considerable significance” in the timing of the incident, noting that it occurred on the eve of Japanese Premier Shigeru Yoshida’s visit to Washington.<sup>69</sup>

Adding to Knowland’s comments, many newspapers viewed the new Soviet line with hesitation. They cited the RB-29 incident as another example where Soviet actions spoke louder than their words:

*The Soviets concluded their two-day celebration of the Thirty-seventh anniversary of the Bolshevik [sic]*

*revolution by staging two events which illustrate again the difference between their words and deeds. In Moscow they gave a banquet for foreign diplomats in the Great Kremlin Palace at which sweetness and light were present. But some seven thousand miles away, at the other end of the Soviet empire, their pilots held a celebration of their own by shooting down another American plane—the ninth to be destroyed in fifteen Communist attacks on American aircraft—and adding another American life to the fifty that had previously been taken.”<sup>70</sup>*

The willingness of the superpowers to moderate their fiery charges and counter-charges in the November 1954, RB-29 shoot down suggested a change in Cold War thinking. Although still wary of Soviet hostility, President Eisenhower recognized the need for reduced tensions. Apparently, Premier Malenkov and First Secretary Khrushchev came to a similar decision although their basic mistrust of western powers remained. International incidents posed by shoot downs of reconnaissance aircraft still acted as a barrier in the path of détente; but, by late 1954, overriding strategic concerns dictated a move toward breaking the cycle of hostility.

Although incidents involving strategic aerial reconnaissance only formed one aspect of the Cold War, the constant reminder of the foe’s hostility shaped the strategic culture of the time. Convinced of the need for intelligence, military leaders convinced the Truman and Eisenhower administrations to authorize dangerous and provocative aerial reconnaissance missions. Moreover, by 1954 technological breakthroughs resulting in the Lockheed U-2 promised both superior intelligence collection and the prospect of undetected overhead photography that would reduce the cycle of hostility established. Both American and Soviet leaders sought opportunities to reduce tension and open diplomatic dialogue. Still, as the later history of the U-2 and the shootdown of Francis Gary Powers showed, strategic aerial reconnaissance proved to be more than an

This aircraft was a conversion to RB-50F standard. An interim conversion saw her operating as an RB-50E on what has been described as "special photographic missions) prior to her final reconfiguration to an RB-50F.



instrument of policy; it influenced the policy and shaped the context faced by policymakers. Equally important, aerial incidents shaped the perceptions

of the public; in the shootdowns and aerial jousting both Americans and Russians found evidence of the hostility of their opponents. ■

## NOTES

1. The PB4Y-2 Privateer was a Navy version of the Consolidated B-24 Liberator of World War II fame. Alan G. Kirk, "Telegram: Ambassador in Soviet Union to Secretary of State, Moscow, April," 1950 in Everett Gleason and Fredrick Aandahl, gen. ed., *Foreign Relations of the United States 1950*, (FRUS 1950) Vol. IV: *Central and Eastern Europe; The Soviet Union*, Rogers P. Churchill, Charles S. Sampson, and William Z. Slanney, eds. (Washington, D.C.: Government Printing Office, 1980, pp. 1141-42.

2. *Ibid.*, pp. 1140-41.

3. Electronic intelligence collection missions, known as "ferret" flights sought the location and technical information on Soviet radar defenses. For detailed accounts of the origins of U.S. strategic aerial reconnaissance see John T. Farquhar, *A Need to Know: The Role of Air Force Reconnaissance in War Planning, 1945-1953* (Maxwell Air Force Base, Ala: Air University Press, 2004); Robert S. Hopkins, "U.S. Strategic Aerial Reconnaissance and Cold War, 1945-1961," (Ph.D. dissertation, University of Virginia, 1998); R. Cargill Hall and Clayton D. Laurie, eds., *Early Cold War Overflights 1950-1956 Symposium Proceedings*, 2 vols. (Washington, D.C.: Office of the Historian, National Reconnaissance Office, 2003); William E. Burrows, *By Any Means Necessary: America's Secret Air War in the Cold War* (New York: Farrar, Straus and Giroux, 2001); and Joe Santucci, "The Lens of Power: Aerial Reconnaissance and Diplomacy in the Airpower Century," (Ph.D. dissertation, Air University, Maxwell AFB, Ala, 2013). Robert Hopkins and Joe Santucci deserve special notice for their fine work in exploring different political dimensions and superior diplomatic perspectives of the consequences of strategic aerial reconnaissance.

Additionally, R. Cargill Hall deserves recognition as the premier authority on US overflights of the Soviet Union during the early Cold War. He and Clayton D. Laurie organized an academic conference on the subject in February 2001, and published its proceedings under the auspices of the Office of the Historian, National Reconnaissance Office, Washington, D.C.

4. Initially written as the "circle of hostility," Dr. Sanu Kainikara's *The Bolt of the Blue: Air Power in the Cycle of Strategies* describes the cyclical strategic nature of air power as an instrument of policy that honed my thinking. Sanu Kainikara, *The Bolt From the Blue: Air Power in the Cycle of Strategies* (Canberra, Australia: Air Power Development Centre, 2013).

5. Adm. Forrest Sherman, Memorandum from Chief of Naval Operations to Secretary of the Navy, Subject: Attack on United States Aircraft by Soviet Aircraft, April, 14, 1950, FRUS 1950, Vol. IV, pp. 1142-43.

6. "McCormick Urges Break in Relations," *New York Herald Tribune*, Apr. 22, 1950, p. 1. Democratic National Committee Library Clipping File (DNC), Foreign Affairs File, Box 154, Folder: Russo-American Incident over Baltic Area, April 1950, Harry S Truman Presidential Library, Independence, MO (HSTL).

7. "Baltic Plane Mystery," *Washington Post*, 28 April 1950, n.p., DNC, Foreign Affairs File, Box 153, Folder: Incident of U.S. Plane Shot Down in Baltic, April 1950, HSTL.

8. "Washington Merry Go Round," *New York Mirror*, May 9, 1950, n.p., *Ibid.*

9. Walter Lippman, "The Baltic Affair," *Washington Post*, Apr. 24, 1950, n. p., DNC, Foreign Affairs File, Box 153, Folder: Incident of U.S. Plane Shot Down in Baltic, April 1950, HSTL.

10. *Ibid.*



11. *Ibid.*
12. Gen. Omar Bradley, Memorandum for the Secretary of Defense, Subject: Special Electronic Airborne Search Operations (SESP), May 5, 1950, President's Secretary's File, General File: Bradley, Omar N., HSTL.
13. Bradley, SESP Memorandum, May 5, 1950, HSTL; Louis Johnson, Memorandum to the President, Subject: Special Electronic Search Operations (SESP), May 24, 1950, President's Secretary's File, General File: Bradley, Omar N., HSTL.
14. "U.S. Asks Return of Property Seized in 1951 Plane Incident," *Department of State Bulletin* 27(December 22, 1952): 980; *New York Times*, November 21, 1951, 1:7. [Hereafter cited as *DSB* and *NYT*.]
15. "Shot in the Balkans," *NYT*, November 22, 1951, 30:3.
16. *NYT*, December 3, 1951, 15:2-6.
17. *NYT*, December 5, 1951, 34:1.
18. *NYT*, December 29, 1951, 1:6.
19. *NYT*, December 21, 1951, 10:3.
20. Colin S. Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), pp. 129-31.
21. "U.S.S.R. Charged with Misrepresenting Facts in Bomber Incident," *DSB* 27(October 27, 1952): p. 650.
22. "Soviet Note of October 12," *DSB* 27(October 27, 1952): p. 649; "Russian Protest Note Admits Shots at B-29 Lost Off Japan," *NYT*, October 13, 1952, pp. 1:2-3.
23. *Ibid.*; "U.S. Bids Soviet Pay for B-29 and Return of Any Survivors," *NYT*, October 18, 1953, pp. 1:3.
24. "U.S.A. and U.S.S.R.," *NYT*, October 15, 1952, 30:2.
25. *NYT*, October 19, 1952, pp. 9:6.
26. "U.S. Plane Downed Near China Coast; Rescuers in Crash," *NYT*, Jan. 19, 1953, pp. 1:1.
27. Henry R. Lieberman, "Formosa Patrols Face New Dangers," *NYT*, Jan. 24, 1953, IV, pp. 7:7.
28. Stephen E. Ambrose, *Eisenhower*, vol. 2: *The President* (New York: Simon and Schuster, 1984), p. 42; *NYT*, Jan. 21, 1953, pp. 20:3.
29. Quoted in Robert F. Futrell, *The United States Air Force in Korea*, rev. ed. Office of Air Force History, (Washington: Government Printing Office, 1983), p. 648.
30. "Strong Protests Made Against Czechoslovak Attack on U.S. Aircraft," *DSB* 27(Mar. 30, 1953): p. 474; "2 Czech MIG's Down American Fighter in U.S. German Zone," *NYT*, Mar. 11, 1953, pp. 1:1.
31. Five aviators died in the crash and two succumbed later from wounds suffered. "Soviet MIG's Down R.A.F. Plane, Kill 5 in Berlin Air Lane," *NYT*, Mar. 13, 1953, pp. 1:1.
32. *NYT*, Mar. 20, 1953, pp. 1:2.
33. *NYT*, April 1, 1953, pp. 11:3.
34. Dwight D. Eisenhower, *Public Papers of the Presidents 1953* (Washington, D.C.: Government Printing Office, 1960), p. 104; James Reston, "Eisenhower Voices Conciliatory View on U.S.-Soviet Ties," *NYT*, Mar. 20, 1953, pp. 1:1.
35. C. L. Sulzberger, "Europe Clings to Hope of Let-Up in Cold War," *NYT*, Mar. 15, 1953, IV, pp. 3:6.
36. "Aggression Over Germany," *NYT*, Mar. 13, 1953, pp. 25:2.
37. *NYT*, Mar. 15, 1953, IV, pp. 1:5-6.
38. "Soviet Attack on U.S. Plane in North Pacific Ocean," *DSB* 28(Apr. 20, 1953): p. 577; Austin Stevens, "U.S. Plane Fired On By MIG Off Siberia; Replies to Attack," *NYT*, Mar. 18, 1953, pp. 1:1; *NYT*, Mar. 24, 1953, pp. 1:2.
39. *Ibid.*; "U.S. Demands Soviet Punish Flier for Attack Off Siberia," *NYT*, Mar. 19, 1953, pp. 1:2; "Soviet Charges U.S. Bomber Was Found Spying on Siberia," *NYT*, Mar. 24, 1953, pp. 1:2.
40. *Ibid.*; "Text of Soviet Note," *NYT*, Mar. 24, 1953, pp. 10:4.
41. *NYT*, Mar. 18, 1953, pp. 1:1.
42. Although official Air Force record of this incident remains classified, the RB-50G was the electronic intelligence version of the B-50 bomber.
43. "Flanders Attacks Air Force on MIG," *NYT*, Mar. 21, 1953, pp. 3:5.
44. *NYT*, Mar. 18, 1953, pp. 3:6.
45. "Infrequent Soviet Flights Over Alaska Are Reported," *NYT*, Mar. 17, 1953, pp. 8:6.
46. "U.S. Strongly Protests Soviet Attack on U.S. Airplane," *DSB* 29(Aug. 10, 1953): p. 179; History of the 55th Strategic Reconnaissance Wing, July 1953, p. 2, Archives Branch, Air Force Historical Research Agency, Maxwell Air Force Base, Ala. (AFHRA).
47. Bruce M. Bailey, *"We See All": A History of the 55th Strategic Reconnaissance Wing, 1947-1967* [Tucson, AZ]: 55th ELINT Association Historian, 1982, p. 46.
48. *Ibid.*, p. 47; History of the 91st SRS, July 1953, pp. 5-6, AFHRA.
49. "U.S. Note of January 26 Regarding RB-50 Incident," *DSB* 30(Mar. 15, 1954): p. 409; "Soviet Fighters Down U.S. Plane; Border Breach Alleged; 16 Missing," *NYT*, Jul. 31, 1953, pp. 2:2.
50. "Soviet Note of August 11, 1953," *DSB* 30(Mar. 15, 1954): p. 412; Alvin Shuster, "Moscow Note Says U.S. Flier Down a Russian airliner," *NYT*, Aug. 1, 1953, pp. 1:1.
51. *NYT*, Aug. 2, 1953, IV, pp. 2:5.
52. "Two Plane Incidents," *NYT*, Aug. 3, 1953, pp. 16:2.
53. J. M. Owens, Letter to the Editor, *NYT*, Aug. 5, 1953.
54. "Unprovoked Attacks by Soviet Aircraft," *DSB* 31(Sep. 20, 1954): p. 417; "Soviet Jets Down U.S. Patrol Plane Off Siberia Coast," *NYT*, Sep. 1954, pp. 1:8, 3:2.
55. "Soviet Attack on U.S. Plane in Sea of Japan," *DSB* 31(Sep. 13, 1954): p. 364; "First United States Note," *NYT*, Sep. 6, 1954, pp. 3:3-4; "Soviet Note," *Ibid.*
56. "Senator Knowland's Wire," *NYT*, Sep. 6, 1954, pp. 3:6.
57. "U.N. Council Opens Plane Case Today," *NYT*, Sep. 10, 1954, pp. 5:4.
58. A. M. Rosenthal, "U.N. Seeks Action by World Court on Downed Plane," *NYT*, Sep. 11, 1954, pp. 1:1.
59. "Relations with Russia," *NYT*, Sep. 9, 1954, pp. 30:2.
60. "U.N. Council Opens Plane Case Today," *NYT*, Sep. 10, 1954, pp. 5:4.
61. "Attack on U.S. Aircraft by Soviet Planes," *DSB* 31(Nov. 19, 1954): p. 811; William J. Jorden, "U.S. Photo Plane Downed in Japan by MIG Fighters," *NYT*, Nov. 8, 1954, pp. 1:8.
62. *Ibid.*
63. Eisenhower, *Public Papers 1954*, 1080; Note 541, *FRUS*, Vol XIV, Part 2, 1216; "U.S. Note," *NYT*, Nov. 9, 1954, pp. 3:3.
64. "Soviet Note," *NYT*, Nov. 9, 1954, pp. 3:4.
65. *NYT*, Nov. 9, 1954, pp. 14:4-5.
66. Eisenhower, *Public Papers 1954*, p. 1032; "President's Press Conference," *NYT*, Nov. 11, 1954, pp. 20:3.
67. *Ibid.*; *NYT*, Nov. 9, 1954, pp. 14:4-5.
68. "Eisenhower Is Praised at Party in Kremlin," *NYT*, Nov. 9, 1954, pp. 14:4.
69. "Knowland For Stronger Action," *NYT*, Nov. 8, 1954, pp. 4:5.
70. "Soviet Words and Deeds," *NYT*, Nov. 9, 1954, pp. 26:1.

**Libyan Air Wars Part 1: 1973-1985.** By Tom Cooper, Albert Grandolini, & Arnaud Delalande. Solihull U.K.: Helion & Co, 2015. Maps. Diagrams. Illustrations. Photographs. Notes. Glossary. Bibliography. Pp. 64. \$29.95. paperback. ISBN: 978-1-909982-39-0

This book is part of Helion's Africa@War Series, a set of over twenty volumes dealing with the seemingly unending series of conflicts on that continent since the end of World War II. For most U.S. readers, operations in Rhodesia, Zambia, Mozambique, South Africa, Congo, Libya, Chad, Central African Republic, Angola, and elsewhere are lost among the larger wars of Vietnam, Korea, and the Middle East. Except for events such as the Gulf of Sidra, where U.S. forces were directly engaged, most of the African conflicts leading to and resulting from the breakup of the great colonial holdings have been little more than blips on the six-o'clock news.

The authors have written three of the series' volumes covering the Libyan Air Wars. In this, the first part of the trilogy, they have done an excellent job of covering not only the Libyan Air Force since its formation, but also appropriate background on the country, its politics and geopolitical relations with its neighbors, and the creation of Libyan military forces from the 1930s on. The story they tell is often difficult to follow, not because of their writing but, rather, the very complexity of the relationships of the many countries in the area, the many regimes ruling these countries (or parts of the countries depending on the state of local civil wars), and former colonial powers. If anything, a reader comes away with a real appreciation for the messy situation throughout much of Africa.

But *Libyan Air Wars* concentrates on the air component of the many conflicts, both internal and external, in which the country found itself. Conflicts with Egypt, and Chad, and Egypt, and Chad (there were a number of these) are some of the main topics covered, but one entire chapter is devoted to the most well-known (to Americans) episode—the Gulf of Sidra freedom-of-navigation crisis. The chapter is a well-written account of not only the Aug. 19, 1981, F-14 shootdown of two Libyan Su-22s, but also of other encounters that took place between U.S. F-4s and various Libyan MiGs and Mirages throughout the crisis.

The book is thoroughly illustrated with an impressive array of over 150 photos (most from the authors' collections and a number in color). It also contains fifteen profile drawings of various French and

Libyan aircraft used over the years that would be of great interest to modelers looking for interesting variants of many Soviet, American, and French designs. The maps are adequate to follow the action, and the tables provide good detail regarding several of the conflicts described.

In short, this is an excellent account of some very interesting, but not well known, military air operations in a tough part of the world. For that reason, it probably won't appeal to all of APH's readers. But, for those interested in learning about this facet of airpower, *Part 1* (and, I suspect, the two subsequent volumes) is hard to beat.

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



**They Gave Me a Seafire.** By R. Mike Crosley. Barnsely, U.K.: Pen and Sword Aviation, 2014. Photographs. Diagrams. Tables. Bibliography. Index. Appendices. Pp. 279. \$39.95 ISBN: 978-1-47382-191-0

This now-classic volume, originally published in 1986, relates the life of Fleet Air Arm carrier pilot Commander R. Mike Crosley, DSC, RN, during World War II. The autobiography quickly joined the ranks of archetypal fighter-pilot accounts by Douglas Bader, R. S. Tuck, and Alan Deere. Crosley was a police officer in London before the war and enlisted in 1940. He served in convoys to reinforce Malta with fighter planes in 1942; provided top cover for the British landings in North Africa in November 1942; protected Lend-Lease convoys off the coast of Norway; directed naval gunfire onto targets in France after D-Day; and, as a squadron commander, flew strikes on Japan in 1945. After the war he became a test pilot and remained in the service for another twenty-five years. Crosley also relates his wartime romance, marriage, and eventual breakup, a theme familiar to many World War II veterans.

This re-issue is two really books: Crosley's autobiography (the bulk of the volume) and a brief biographical sketch by his widow, excerpting Crosley's letters to family and friends. Added as a personal postscript, it considerably humanizes him, exposing personal details and the depth of emotions familiar to families affected by wartime separation.

*They Gave Me a Seafire* is a refreshing look at an oft-covered subject. For instance, it is well-known that British carriers routinely carried fewer aircraft than American carriers. For the Mediterranean campaigns, Crosley notes that it dwindled

to two! This was remedied by the time he deployed to the Pacific in 1945 aboard HMS *Implacable* with upwards of eighty planes crammed onto the relatively small British carriers.

Crosley brings an analytical, engineering perspective to his subject. His insights into aircraft strengths and weaknesses often give the book the tone of a wardroom discussion. He clearly intended this work to be his testament on matters military. He also included fourteen very informative and detailed appendices on wartime incidents, eyewitness accounts, and his personal analyses of such campaigns as the 1982 Falklands War.

Crosley's stories of young men at war, tension before missions, squadron life, ribald jokes and songs, misadventures on leave, and speculations on the persistent phenomenon of aviation gas mysteriously appearing in the fuel tanks of their cars are self-deprecatingly and entertaining. There is plenty of hangar talk of air combat. Crosley was particularly devoted to the Seafire and devotes much space to its design, flying characteristics, virtues and shortcomings.

The bibliography is a fairly comprehensive coverage (as of 1986) of the war as Crosley fought it. He sourced many items from letters, personal documents, and the diary he faithfully maintained throughout the war. He assumes a reader would understand the terms, concepts, and places. Although a glossary would have been helpful, David Wragg's *The Fleet Air Arm Handbook 1939-45* (2003) is a great reference to have at hand while reading this book.

Those familiar with the Fleet Air Arm will find this book a front-row seat to its history. Surveys such as MacKay's *Britain's Fleet Air Arm in World War II* (2004) and Darling's *Fleet Air Arm Carrier War* (2010) echo Crosley's analyses of aircraft development and British carrier warfare tactics. Pyne's and Mills' *Fleet Air Arm memories: Tales of the Brummagem Bastard* (2012), a biographical account of an FAA seaman, offers a different view of the campaigns in which Crosley fought. March's *British Warplanes of World War II: Combat Aircraft of the RAF and Fleet Air Arm 1939-45* (2002) is a good reference to the many types of aircraft Crosley encountered. Books on the Seafire (Spitfire) are legion; among the most recent is Darling's *Supermarine Seafire* (2008). Smith's *Task Force 57: The British Pacific Fleet 1944-45* (2001) rounds out Crosley's account of his 1945 combat in the Pacific. Adlam's *The Disastrous Fall and Triumphant Rise of the Fleet Air Arm from 1912 to 1945* (2014) offers some perspective on Crosley's often scathing opinions of



Fleet Air Arm history, politics, aircraft development, and strategies from World War I to the Falklands War.

Crosley provides at least one photo of each aircraft, campaign, and place that figured in his wartime service. Sourced from personal collections and official files, each is well-captioned and keyed to specific points in the text.

I gained new appreciation for the Fleet Air Arm's wartime operations and highly recommend this book.

Steve Agoratus, Hamilton, New Jersey.



**Check Six! A Thunderbolt Pilot's War Across the Pacific.** By James C. Curran and Terrance G. Popravak, Jr. Havretown Penn.: Casemate, 2015. Maps. Photographs. Appendices. Glossary. Bibliography. Pp. 334. \$32.95 ISBN:978-1-61200-299-6

"Jug" Curran joined the Army Air Forces immediately following Dec. 7, 1941, and fought his way across the Southwest Pacific in P-47 Thunderbolts from 1943 to 1945. He was active in the 460th Fighter Squadron until his death in 2012. Lt Col Popravak spent twenty-four years in the USAF and is the Oregon Air National Guard's volunteer historian. He picked up Curran's writing project after his death. Popravak based the book on letters Curran wrote home during the war and memories sixty or more years after the fact. The letters tell the story; Popravak added additional or corroborating information within the text and extensive footnotes.

The SW Pacific air war was fought on a far different scale from that in Europe. The distances to targets were greater than those envisioned in aircraft design specifications. The P-47 Thunderbolt was the largest, heaviest, and fastest single-engine fighter in the U.S. inventory and is most remembered for its work in Europe. While it held its own against the Luftwaffe, it more than made for any shortcomings in the ground attack role. But, in the SW Pacific, many senior officers in the Fifth Air Force were of the opinion that the P-47 was no good as a combat fighter. Gen. George Kenney said in *Gen. Kenney Reports* that it lacked range, took too long to get off of the ground, had no maneuverability, would not pull out of a dive, and had a weak landing gear and unreliable engine.

The book well documents Curran's primary training at Randolph Field, Texas; basic training at Enid AAFB, Oklahoma; and advanced training in Louisiana. The real meat of the story however, is the young lieutenant's transfer to

the SW Pacific to join the 348th Fighter Group. He was introduced to combat under the tutelage of one of the early aces, Col. Neel Kearby. Curran was posted to one of the outlying fighter strips protecting the Allies' tenuous hold on New Guinea. The stories of operations from these minimally capable strips hacked out of the jungle by the engineers and barely capable of supporting the planes stationed there bring home the truly primitive conditions under which the Allies leapfrogged up the coast of New Guinea and moved into the Philippines.

Curran was a member of the 460th Fighter Squadron, an elite unit that supported MacArthur's moves with minimal advance notice in order to provide fighter cover immediately following establishment of a landing area. It was always ready to move at a moment's notice and establish an operating location at the barest of bases near the front. The stories of experimenting with drop tank configurations and bomb carrying contrast with the experiences of P-47 units in the European Theater. Being shot down, crashing, or bailing out in the Pacific frequently meant death—if not from the Japanese, then from jungles or sharks.

The 460th pioneered close air support of the Army and Marines as well as ship killing using the P-47's eight .50 cal. machine guns and 500-pound bombs. Curran does not discuss in detail encounters with Japanese aircraft, although he is credited with four confirmed kills and one probable. Charles Lindberg's visits to the unit to teach pilots long distance flying techniques are detailed as well.

Curran details the privations experienced as squadrons moved up the coast of New Guinea from one primitive airfield to another. The lack of any amenities and the need to still accomplish the mission are bluntly discussed. The lighter moments as pilots rotated to Rest and Recuperation (R&R) leaves in Australia illustrate just how difficult life was in the SW Pacific theater. The ticket to R&R was, in Curran's case, a precipitous drop in weight.

The book is an easy read that moves along well and presents a theater of operation which is not widely documented. It is a solid collection of memories fleshed out with current information to present the story of a fighter pilot in the SW Pacific. For those familiar with stories of fighter pilots in the European Theater, *Check Six!* draws a stark counterpoint.

MSgt. Al Mongeon, USAF (Ret.),  
Springfield, Virginia.



**Operation Chowhound: The Most Risky, Most Glorious U.S. Bomber Mission of WWII.** By Stephen Dando-Collins. New York: Palgrave MacMillan Trade. 2015. Maps. Photographs. Notes. Bibliography. Index. Pp. 248. \$28.00 ISBN 978-1-137-27963-7.

Stephen Dando-Collins is an award-winning military historian and novelist with numerous highly praised books on antiquity and American, British, Australian, and French history. These include *Caesar's Legion: The Epic Saga of Julius Caesar's Elite Tenth Legion and the Armies of Rome*; *Nero's Killing Machine: The True Story of Rome's Remarkable Fourteenth Legion*; and *Mark Antony's Heroes: How the Third Gallica Legion Saved an Apostle and Created an Emperor*.

Toward the end of World War II, food supplies became increasingly scarce in The Netherlands. After the Allied landings on D-Day, conditions grew worse in the Nazi-occupied Dutch territories. The Allies were able to liberate the southern part of the country, but they did not attack German forces in the western part for fear of massive civilian casualties (the western Netherlands is densely populated). In addition, Allied liberation efforts had come to a halt when Operation Market Garden, their attempt to gain access to western Germany via the bridge across the Rhine at Arnhem, failed. During that battle, Dutch railway workers, incited by the Dutch government in London, went on strike in order to aid the Allied assault. In retribution, Germany placed an embargo on food transportation to the western Netherlands. Thus, a tragic irony of Market Garden's failure and attempts to reduce collateral civilian casualties, was the *Hongerwinter* (Hunger Winter) of 1944-45 in which 25,000 Dutch citizens starved to death.

Operation Chowhound (May 1-8, 1945) involved 2,268 sorties flown by the USAAF to drop food to 3.5 million starving Dutch civilians in German-occupied Holland. This operation was conducted in concert with the British-Canadian Operation Manna that began first (April 29) and included 3,298 sorties. In total, both operations dropped over 11,000 tons of food into the still-unliberated western part of The Netherlands by the end of the war in Europe.

Dando-Collins begins his true story by providing background material on events and personalities leading up to Chowhound. Prince Bernhard, a German-born aristocrat who married Princess Juliana, heir to the Dutch throne, in 1937, became a Dutch citizenship and was a

principal player in entreating the Allies to provide food to the starving population. He was also responsible for organizing the distribution of food throughout the occupied territory after the drops. All the while, Bernhard was suspect, due to his ties to the Nazi Party during the 1930s. A second major player was the German Reichskommissar of occupied Holland, Arthur Seyss-Inquart, an opportunist who realized the war was lost and wanted to “clear his name” by supporting humanitarian efforts in defiance of the Fuhrer, to ease retribution that he knew would follow after the peace. Dando-Collins describes Operations Market Garden (*A Bridge Too Far*) and Watch on the Rhine (Ardennes Counteroffensive) and their roles in setting up the conditions for *Hungerwinter*. Next he tells of the meetings, actions, and agreements of major allied personalities such as Queen Wilhelmina, President Roosevelt, Gen Marshall, Gen Eisenhower, Gen Smith, and Air Commodore Geddes (who, after planning Overlord, planned the entire Chowhound operation). These principals and their adjutants were ultimately responsible for authorizing the massive relief operation. The remainder of the book provides action-packed vignettes and testimonials surrounding various relief flights and crews, nervous at first about trusting the Germans not to shoot but later exhilarated and proud for their humanitarian work.

This story chronicles a little-known, but extraordinary, relief operation. Dando-Collins has obviously done his research. Each chapter is both informative and attention-grabbing. It is a very good read!

*Frank Willingham, docent, NASM's Udvar-Hazy Center.*



**The Bridge to Airpower: Logistic Support for the Royal Flying Corps Operations on the Western Front, 1914-18.** By Peter Dye. Annapolis MD: Naval Institute Press, 2015. Illustrations. Photographs. Notes. Appendices. Bibliography. Index. Pp. 270. \$44.95 ISBN: 978-1-61251-839-8

There is an adage about military history that says amateurs study battles, but professionals study logistics. Although logistics lacks the panache and excitement of the clash of arms, its importance, to quote Alfred Thayer Mahon, is “as vital to military success as daily food is to daily work.” This, in essence, is the theme of Peter Dye’s exceptional study of the logistic support given to the Royal Flying Corps (RFC) on the Western Front during World War I.

In this extremely detailed and well-researched account of the use of airpower in World War I, Dye argues that the RFC’s greatest contribution to victory on the Western Front was its ability to provide the continuous direction of artillery fire from the air using maps produced from aerial photography. As he explains in the introduction, “The critical development in this achievement was the creation of a [logistic] system that enabled delicate, often temperamental, and constantly evolving machinery to be supported under the most testing operating conditions . . . in the face of wastage that averaged more than 50 percent of front-line strength per month.” To prove his thesis, Dye takes us through an elaborate accounting of the logistics employed by the RFC during three campaigns on the Western Front: the Battle of the Somme, where the RFC achieved substantial operational success but did not face serious opposition; Arras and Third Ypres, where the RFC operated on a much larger scale but had found it hard to achieve air superiority; and the Hundred Days, where the RAF had to adapt to mobile warfare.

Dye is well qualified for this task. After graduating with a degree in aeronautical engineering from the Imperial College London, he served in the RAF for 35 years as an aviation statistician rising to Vice Air Marshal. After retiring, Dye obtained his Ph.D. from the University of Birmingham. His doctoral thesis formed the basis for this book.

Although *The Bridge to Airpower* is filled with detailed facts and information about the RFC’s operations on the Western Front, it is not for the faint of heart, as it is geared specifically for the logistician. This is made amply clear in the introduction, which, like most modern theses, begins with a historiography. In Dye’s case this involves an extensive overview of the literature on logistics in war. While this might be of interest to the professional logistician, it will not appeal to those solely interested in the operational aspects of airpower in World War I.

This is more than compensated for in the chapters that focus on RFC operations on the Western Front, the RFC’s logistic system, and the supply of aircraft and aero-engines. Later chapters cover each of the three campaigns previously mentioned. Having demonstrated the critical importance of air superiority in enabling employment of accurate, predicted, indirect artillery fire, and establishing the importance of logistics in maintaining air operations, Dye concludes with a detailed analysis of the RFC’s logistic performance and its comparison with the logistic principles articulated by James Huston in his

classic study of the history of US Army logistics, *The Sinews of War*.

While *The Bridge to Airpower* may be a little too specialized and detailed for the general reader, it is a must-have resource for the serious student of airpower on the Western Front, anyone interested in the development of warplanes and aero-engines, and those scholars and military officers concerned with the logistics of airpower.

*Thomas Wildenberg, Tucson, Arizona.*



**To Rule the Winds: The Evolution of the British Fighter Force through Two World Wars. Volume 1: Prelude to Air War – The Years to 1914.** By Michael C. Fox. West Midlands, U.K.: Helion & Company, 2014. Tables. Photographs. Notes. Bibliography. Index. Pp. xviii, 314. \$69.95 ISBN: 978-1-909384-14-9

*To Rule the Winds* tells the story of one element of British military aviation—the fighter force—from its earliest beginnings at the start of the 20th century to the Battle of Britain in 1940. In this, the first volume of a multi-volume work, Michael Fox begins the story at the dawn of aviation and takes it to the summer of 1914, just before the start of World War I. The second volume, scheduled for release in October 2015, covers the war years; subsequent volumes have not yet been identified.

Many books have been written on this subject. What distinguishes Fox’s work is its exceptionally heavy reliance on original source material. Rather than referring to and summarizing documents such as Parliamentary records, military reports and correspondence, and articles from contemporary journals, Fox quotes from these sources extensively so that we can read the story in first-person accounts of the men who were at the center of events.

The depth of Fox’s research is impressive. And going directly to the original sources sounds like a great idea, for it should help the reader gain a deep understanding of the people and events who shaped this complex history. Unfortunately, the great idea is taken too far. Instead of contributing to a story that flows smoothly from beginning to end, the numerous quotations from multiple sources give the narrative an erratic flow that makes the book difficult to read; the reader goes from one source to another, frequently reading conflicting statements from various sources, or repetitious statements that add little to the story. A great many isolated facts are presented, but in



many cases they are not pulled together effectively to draw conclusions and make cogent points. An author's job is to conduct research, identify connecting threads, sort out and resolve conflicting information, and weave it all into a coherent story. Throughout much of the book this is lacking, and the reader is left to do this on his own. Histories should be well-researched and well-sourced, but there is a point at which the use of direct quotations goes too far. This book reaches that point.

Fox would have been more effective if he had written the story in his own words, with the narrative supported by solid references and occasional quotations to emphasize key points. Instead, he chose to make the quotations the focus of the book. A small example of what the book could have been is found in the final chapter. In these few pages Fox did write in his own words; the result is a clear, highly readable summary of the entire book.

Criticism notwithstanding, Fox does a good job of structuring the early history of Britain's fighter force into meaningful elements. He addresses the organizational evolution of the Royal Flying Corps and the eventual schism between army and navy aviation elements, the origins of the Royal Aircraft Factory, the early experiments with a wide range of aircraft armament, and the development of wireless telegraphy as a means of communicating reconnaissance results to ground commanders. Two themes are clear. First, in the years leading up to World War I, the British had to make do with woefully inadequate numbers of aircraft whose limited capabilities required difficult trade-offs among speed, range, survivability, and other factors. And second, as war loomed on the horizon, the British believed that the single most important mission for combat aircraft would be reconnaissance, with fighters initially coming into being only as a means of protecting the recon craft.

It is difficult to recommend this book to others. But for the reader who wants to digest a great deal of original source material, perhaps the book would be useful. For those who do read the book, one suggestion would be to start with the final summarizing chapter and then go back to the beginning; this would help provide context for the details provided in the rest of the volume.

*Lt. Col. Joseph Romito, USA (Ret.),  
Docent, NASM's Udvar-Hazy Center.*



**Flying Warbirds: An Illustrated Profile of The Flying Heritage Collection's Rare WWII-Era Aircraft.** By Cory

Graff. Minneapolis, Minn.: Zenith Press, 2014. Photographs. Index. Pp. 240. \$40.00 ISBN: 978-1-60346495.

This coffee table book is an outstanding combination of both text and photographs. Located at Paine Field in Seattle, Washington, the Flying Heritage is one of the world's premiere flying collections of primarily World War II aircraft. The collection is a unique mixture of both iconic and exceptionally rare aircraft. In almost all cases the aircraft are still flown.

Graff is the collection's Military Aviation Curator. *Flying Warbirds* is certainly one of the finest of his books. Rather than simply providing a laundry list of the Collection's aircraft, Graff portrays the aircraft in the context of the technological advancements leading up to and through World War II. He divides the text into nine chapters, each of which couples two or three aircraft based on two themes: the advancing technology or their respective role during the war. All told, Graff describes nineteen of the Collection's aircraft.

He begins with the Collection's more basic and oldest aircraft, the Curtiss JN-4D Jenny and the Polikarpov U-2 (PO-2) light night bomber, and concludes with the most radical aircraft, the Messerschmitt Me 163 B-1 Komet and Me 262 A-1A. In between, Graff expertly describes the British Hurricane Mk. XII and Spitfire F. Mk. Vc; Russian I-16 type 24 *Rata* and Il-2M3 *Shturmovik*; German Bf 109 E-3, Fw 190 A-5 and 190 D-13, Fi 156 C-2 *Storch*, Me 163, and Me 262; Japanese Ki-43 *Hayabusa* (Oscar) and A6M3-22 *Reisen* (Zero); and American P-40C Tomahawk, P-51D Mustang, B-25J Mitchell, P-47 Thunderbolt and F6F-5 Hellcat.

Graff includes the history of each aircraft type, its technological advances, and its role during the war. He then goes on to tell the specific history of each, how the aircraft came to be in the Collection, and the significance of the aircraft's paint scheme. Many of the American aircraft are painted in the operational paint scheme of local natives. The text flows well and is very informative while not bogging the reader down with minute details of each aircraft.

Over 250 photographs illustrate the story of the aircraft. The photography is beautifully done and certainly a strength of the book. The book's high quality gloss paper helps maintain the original quality of the images. While Graff includes air-to-air photography as well as period images, the heart and soul of the book is the amazing "studio" images of the aircraft in which each is expertly lit and portrayed in its restored beauty—not only the full aircraft,

but also detailed components (e.g., engines and bomb bays) and the cockpit.

The Flying Heritage Collection contains more aircraft and artifacts than those Graff covered. He avoids the temptation of including the rest of the Flying Heritage Collection's impressive collection that includes World War II tanks, a MiG-29 Fulcrum, V-1 and V-2 missiles, and a UH-1 Huey gunship helicopter. Including these would have taken away from his intended focus. To see the complete collection, readers should visit <http://flyingheritage.com>.

*Flying Warbirds* is more than just an airplane coffee table book. It is an excellent portrayal of the collection's focus "on technical themes from an era of amazingly rapid change." Smoothly flowing text combined with stunning photography expertly illustrates the spirit of the Flying Heritage Collection. For both those who are casually curious about World War II aviation and the hard core enthusiast, this book is certainly a must read.

*Lt. Col. Daniel J. Simonsen, USAF (Ret.),  
Bossier City, Louisiana.*



**Intercept 1961: The Birth of Soviet Missile Defense.** By Mike Gruntman. Reston Virginia: American Institute of Aeronautics and Astronautics, 2015. Illustrations. Photographs. Tables. Notes. Appendices. Bibliography. Index. Pp. xviii, 309. \$39.95 ISBN: 978-1-62410-349-0

Now, almost a quarter-century after publication of *The Origins of SDI, 1944-1983* Don Baum's acclaimed history of U.S. missile defense University of Southern California astronautics professor Mike Gruntman has narrated, for the first time in American English, the origins and early history of Soviet ballistic missile defense.

Professor Gruntman's *Intercept 1961* takes historians, engineers, and other interested readers from the design of Soviet anti-aircraft missiles, air defense systems, and work on a missile tracking radar in the late 1940s into the formulation of ballistic missile defense concepts in the 1950s. The book explains how, despite professional rivalries and "political scheming" among key individuals, chief designers, and top government officials in the totalitarian state, work on the missile defense system antimissiles, radars, computing power, and command capabilities progressed and was tested at Sary-Shagan in the Kazakhstan desert. Finally, on 4 March 1961, the Soviet Union successfully used a non-nuclear antimissile to

intercept an intermediate range ballistic missile and destroy its warhead.

Gruntman reminds his audience that he could not have researched and written this incredibly detailed volume without the large quantity of Russian-language source material that became available after the collapse of the Soviet Union in 1991. Perusal of publication dates in his footnotes and bibliography, which contain citations for numerous memoirs and technical journals, confirms this. Access to declassified U.S. intelligence reports and photoreconnaissance imagery aerial and satellite enabled him to construct a narrative about what the United States knew that parallels the evolving Soviet story. This makes the unfolding tale especially intriguing. Inclusion of a brief history of "First U.S. Missile Intercepts" in Appendix A of Gruntman's volume adds additional context to his account of the quest for a Soviet missile defense capability.

*Intercept 1961* even sets the stage for a follow-on study to convey in greater detail the evolution of the Soviet missile defense system into 21st-century Russia and to explore in equally great detail the relationship of that system to the pursuit of antisatellite weapons, ballistic missile early warning, and space-based weapons. Gruntman offers sufficient information to whet even the least curious reader's appetite for more. His introduction of the role played by "Soviet princelings" during the development of the Soviet missile defense system also leaves me wondering about the influence, for better or worse, of that phenomenon across all Soviet enterprises and the extent to which it has survived in today's Russia.

Thanks to Gruntman's scholarly diligence, analytical skills, masterful ability to translate Russian texts, and superb writing style, we have a technically dense but easily comprehensible account of the roots of a system that remains an active bulwark in Russia's defensive infrastructure. As he suggests early in his narrative, Soviet political and military leaders always recognized the "selective virtue of defense," and after more than a half-century, their successors remain cognizant of "the eternal competition between the sword and the shield." *Intercept 1961* makes this unquestionably clear.

*Dr. Rick W. Sturdevant, Deputy Command Historian, HQ Air Force Space Command, Peterson AFB, Colorado.*



**Fighter Aircraft Combat Debuts, 1915-1945: Innovation in Air Warfare before the Jet Age.** By Jon Guttman.

Yardley PA: Westholme Publishing. 2014. Photographs. Notes. Bibliography. Index. Pp. 341. \$35.00 ISBN 978-1-59416-200-8

Jon Guttman is research editor for Weider History Publications. Specializing in World War I aviation, he has written more than a dozen books on aviation history including *The Origin of Fighter Aircraft*; *Fighting Firsts: Fighter Aircraft Combat Debuts from 1914-1944*; and *SPAD VII vs Albatros D III: 1917-18*.

At first, military air operations tactics involved unarmed aircraft used for reconnaissance, basically extending the eyes of ground forces. Soon, the need to deny such reconnaissance to the enemy led to air-to-air combat in which each side tried to gain air superiority.

Fighter development in the decades following WWI saw innovations in aerodynamics, structures, power plants, and armament. Fighter tactics evolved in parallel, emphasizing basic concepts that, with modification, remain applicable today. Well-known fighters, such as the Sopwith Camel, Fokker Triplane, Messerschmitt Bf 109, Mitsubishi Zero, North American Mustang, and Supermarine Spitfire, are familiar even to the most non-aviation-minded persons. The main emphasis of this work is on the not-so-well-known circumstances of fighter combat debuts for a wide variety of fighter aircraft—those that first saw action in WWI, the inter-war years, and World War II. Some made their mark almost from the outset, while others showed rather less promise than they would ultimately realize. Guttman also discusses the all-important human element: "It was the pilot who determined how a new plane did, and the results were not always in direct relation to the plane's capabilities."

The book has nineteen chapters, each dealing with a sub-era of the two world wars and the years between: the earliest fighters 1914-16; Halberstadt and Albatros biplane scouts, 1916-17; fighter development 1916-17; Sopwith and Fokker Dr.1 triplanes; fighters of 1918; fighters of the Spanish Civil War 1936-39; European fighters 1930-41; Hurricane and Spitfire 1930-41; Japanese Fighters 1937-41; licensed and leased Fighters 1939-42; American fighters 1941-43; Fulmar and Firefly 1940-44; German, Italian, and Japanese Fighters, 1941-44; Soviet fighters 1941-44; F4U and F6F 1943; cannon-armed fighters 1940-44; night fighters 1940-44; improvisations and developmental dead-ends 1940-45; and Me 262, Meteor, and P-80 1944-45.

Each chapter begins with an overview of the political status and ramifications

leading to the primary conflicts of the era. The general states of aircraft technology and availability are then discussed leading to short physical and operational descriptions of each primary aircraft discussed in the chapter. Finally, Guttman presents vignettes of early combat action and results. This information is obviously the result of much research. While the book is not necessarily one a reader will want to sit down and read cover to cover, it is an excellent historical reference. The quite complete index allows easy searches for period personalities and organizations, aircraft and engines, and even significant naval ships. The extensive bibliography and reference notes are also of particular use in research.

There are not enough photographs for a reference containing this many aircraft. Volume size is important and there are many aircraft photos, but I found myself sitting at the computer to pull up pictures of aircraft under discussion. Picture quality is adequate, but not excellent, due to the printing process.

Overall, I found this to be a fascinating read. It is of excellent value to both aviation and period historians. It provides a view of fighter aircraft innovation and operations from a quite different perspective. This is definitely a worthwhile addition to any aviation enthusiast's bookshelf!

*Frank Willingham.*



**The Georgetown Set: Friends and Rivals in Cold War Washington.** By Gregg Herken. New York: Alfred A. Knopf, 2014. Photographs. Map. Index. Notes. Pp. 494. \$30 ISBN 978-0-307-27118-1

This well written, incisive, and highly informative book captures the color, the era, and the personalities of an incredible period in recent American history—The Cold War—as played out in the drawing rooms of Georgetown. It is about the extraordinary influence of a coterie of elitist insiders on American policy, especially foreign affairs and intelligence operations, spanning five presidencies.

At the center of this thoroughly researched account of political columnists, elected and appointed officials high in government, and political hopefuls and spies—often known collectively as the Eastern Establishment—are the writers and brothers Joseph and Stewart Alsop. They played hard with their Ivy League school connections to gather around them the power brokers of Washington society. The key personality of The Georgetown Set—Joe Alsop—appears in this book as



an incredibly arrogant and strongly opinionated columnist who held sway over some of the leading Cold War decision makers in Washington. His voice became such a powerful influence in the press that President Kennedy had, on occasion, come to his house uninvited to discuss the most pressing issues of the day. The same Alsop, whose reporting on the Vietnam War relied almost entirely upon senior officials in Washington and Saigon, patronizingly corrected a 14-month veteran of ground combat operations, the highly regarded John Vann, on his firsthand observations of the war's failures.

Through the Cold War's prominent personalities, Herken highlights the incredible sense of entitlement and self importance practiced by elitists serving in the State Department, the CIA, and in government. George Kennan, well known for his seminal concept of Containment in the early stages of the Cold War, is among some of the most self impressed in a group of oversized egotists appearing in this book.

Herken recounts many of the defining events of the Cold War as played out at dinner functions in Georgetown: the so called missile gap and ensuing missile race, clandestine operations in eastern Europe, the Berlin and Cuban Missile crises, the bringing down of legitimate governments in Iran and Guatemala, the Hungarian Revolution, and many other affairs.

*The Georgetown Set* brings to light a side of the historical account that has been often downplayed or ignored. Herken closes on the end of that era and the downfall of Joe Alsop. As with many other Cold War personalities, Alsop fell to the side as a consequence of his failure to properly grasp both the domestic and international impact of the Vietnam War on America's policies, relations, and international standing.

The end of the Georgetown Set era became abundantly clear, as described in this book, when homes formerly lived in by diplomats, elected officials, journalists, and spies were now occupied by lobbyists, venture capitalists, and corporate moguls. As Kay Graham, longtime owner of *The Washington Post* and a central figure in the Georgetown Set, observed, "we have outlived our times."

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



**Alan Turing: The Enigma.** By Andrew Hodges. Princeton New Jersey: Princeton University Press, 1983. Diagrams. Photo -

graphs. Notes. Index. Pp. xxxii, 736. \$16.95 paperback. ISBN: 978-0-691-16472-4

This book was a challenge on a number of levels. First is its sheer length. At well over 700 pages, it is exhaustive but still left me with a sense of incompleteness about the subject. Then there is Hodges' approach to the subject. Billed as a scientific biography (and the scientific element is pervasive and comprehensive), it really focusses more on Turing's ideas than him as a person. The discussion of Turing the man often seems haphazard; major events and milestones of his life are discussed in a seemingly very offhand way. Further, more mundane references to early twentieth century British history and the social system without explanatory notes confuse a non-British reader. Taken together, these add up to a challenging but, in the end, worthwhile look at a man who Hodges rightly assesses as an enigma.

Many people will be familiar with Turing based on Benedict Cumberbatch's portrayal in the movie *The Imitation Game* that focused more on the more human events of Turing's life. The book is vastly different. It is not a traditional biography; anyone looking for that will be disappointed. It traces ideas and their development at the expense of learning about Turing the man. Hodges points out there is relatively little primary-source material to draw from; but his method of discussing events, relationships, and Turing's nonintellectual development—while not random—is often hard to follow. He rarely goes into detail on personal events, and it leaves one with the aforementioned sense of incompleteness.

Turing has been acknowledged as one of the key players in the Allies' success in breaking the German Enigma code. The back cover states, "It is only a slight exaggeration to say that Turing saved the Allies." However, anyone looking for the definitive story of the cracking of the German Enigma codes would do better to look elsewhere. The narrative discusses his work on this project at length but in such a way that there is no sense of his centrality to the effort.

Hodges is at his best explaining and discussing ideas. He is a scientist but also a gifted writer who takes complex ideas and presents them in a way understandable to the less scientifically oriented. He has tremendous sympathy for his subject, but this never interferes with his discussions of Turing's ideas and their impact. Turing's contributions extended from the purely academic early in his career to his much more application-oriented work through the war and beyond. Probably the most interesting part of the book was the

discussion of the development of the modern computer. As with most things in his life, Turing was instrumental in many aspects of computer development (early computers were often referred to as Turing machines); but, by the time it began to have practical use, he had become bored and moved on to new projects.

The book was first published in 1983 when information about Ultra and the Enigma codebreaking was still becoming public knowledge, and sources on Turing and his work were not extensive. In the update, Hodges chose to address issues of fact and interpretation in the preface rather than revising the text. The information was helpful but should have been included as an afterword. Without the book's foundation to draw from much of the updated information had no context. I had to reread the preface after finishing the book.

This is a difficult read. The size, scientific subject matter, organization, and cultural idiosyncrasies might discourage someone from tackling it. That would be a mistake. It demands your full attention and will not answer all your questions, but in the end it is worth the effort.

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



**First to Fly: The Story of the Lafayette Escadrille, the American Heroes Who Flew for France in World War I.** By Charles Bracelen Flood. New York: Atlantic Monthly Press, 2015. Photographs. Notes. Bibliography. Map. Pp. 265. \$25.00 ISBN: 978-0-8021-2365-7; and **Yanks in the RAF: The Story of Maverick Pilots and American Volunteers Who Joined Britain's Fight in WW II.** By David Alan Johnson. New York: Prometheus Books. 2015. Notes. Photographs. Bibliography. Index. Pp 281. \$25.00 ISBN: 978-1-63388-022-1

These two books examine Americans fighting under foreign flags in Europe in two different wars.

"The skies drew those men to them like moths to a flame," declared an American pilot in *First to Fly*. "The idealists loved to fly; the adventurers loved to fly; the gamblers, engineers, race car drivers, writers, athletes—they all loved to fly," he went on to declare. This certainly applied at the end of the Great War of 1914-1918, but not at the beginning. Influenced by their affection for France and all things French, many young Americans rushed to join the conflict not in the skies, but in the trenches in the French Foreign Legion.

In 1914, American and French military leaders showed little interest in aircraft as a feature of warfare. Marshal Ferdinand Foch, France's top military leader declared, "The airplane is all very well for sport, but useless for the army." That assessment—at least for the French—changed in record time. Soon, observation aircraft with fighters as a countermeasure became vital military assets, even drawing American volunteers out of the trenches.

Very few candidates for France's *Service Aeronautique* had ever set foot in an aircraft, let alone mastered the craft of piloting. All had to endure the primitive nature of early flight training, often as risky as subsequent aerial combat. In all, 269 American pilots were trained and flew with various French squadrons before the United States entered the war. They were listed as being in the Lafayette Flying Corps. The *Lafayette Escadrille*, established in the summer of 1916, was the only squadron that, with the exception of its French commander, Captain Georges Thenault, and two attached French Lieutenants, was composed entirely of Americans. French leaders understood the propaganda value of an all-American squadron.

Flood has assembled an interesting, though limited, narrative of the American experience in French aerial combat. His sources consisted principally of personal letters, diaries, and published memoirs of American pilots. As a very limited history, *First to Fly* seems more appropriate as a young-adult book. For a recent, better researched, and more detailed story of Americans who flew in World War I, I recommend *The Unsubstantial Air* by Samuel Hynes (reviewed in *APH* Spring, 2015).

In *Yanks in the RAF*, historian Johnson has reached beyond the Eagle Squadrons to identify those Americans who served with other RAF units such as Bomber and Coastal Commands. But, as he points out, many Americans declared themselves to be Canadians; thus, there is no accurate count. While *Yanks* is devoted mainly to the Eagle Squadrons, Johnson does provide some interesting details on American pilots in the RAF not posted to an Eagle Squadron.

The sources, both published and unpublished, are extensive; but absent is Col Philip Caine's *Eagles of the RAF* (reviewed in *APH* Winter 1993). Caine was a professor of military history and experienced command pilot. Johnson's understanding of air power history seems limited to his research; his failure to avail himself of Caine's work has reduced the value of *Yanks*. Further, one of Johnson's sources

is *The Eagles Roar*, a memoir by Eagle pilot Byron Kennerly. What Johnson missed is that the book was a fraud. Kennerly wasn't with the Eagles long enough to fly combat. He has been described as "a congenital liar and wild man."

One highlight of Johnson's book is his chapter covering Operation Jubilee, the August 1942 Dieppe raid. It is informative and well-written. RAF leaders were slow to accept American pilots as qualified to serve as squadron leaders (S/L), a reality that really bugged the Americans. However, by the time of Jubilee, all three Eagle squadrons participated and were commanded by Americans (the S/L of 121 Squadron was ill, however, and a British officer was in temporary command). The Eagles probably flew both the opening and closing sorties of Jubilee. Though the operation was considered a failure, the performance of the Eagle Squadrons was judged favorably with more victories than losses.

*Eagles of the RAF* stands as the best available reference to the memorable Eagle Squadrons. *Yanks in the RAF* unfortunately fails to measure up to the subject. It does, however, provide additional information about American pilots who volunteered and served in RAF units other than the three Eagle Squadrons.

Robert Huddleston, WWII fighter pilot,  
Chapel Hill NC



### **Melvin Laird and the Foundation of the Post-Vietnam Military, 1969-1973.**

By Richard A. Hunt. Washington, DC: Government Printing Office, 2015. Photographs. Notes. Glossary. Bibliography. Index. Pp. xx, 708. \$89.00 (digital copies may be downloaded at [http://history.defense.gov/Portals/70/Documents/secretaryofdefense/OSDSeries\\_Vol7.pdf](http://history.defense.gov/Portals/70/Documents/secretaryofdefense/OSDSeries_Vol7.pdf)) ISBN: 978-0-16-092757-7

How did a career politician with almost no managerial experience skillfully guide the Department of Defense (DoD) through what was perhaps the most challenging and contentious time in its history? Dr. Hunt thoroughly answers this question in Volume VII of the authoritative Secretaries of Defense (SecDef) Historical Series. With 120 pages of notes and bibliography, Hunt has left few stones unturned in researching both primary sources and four decades of literature relating to Melvin Laird's tumultuous four years in the Pentagon. The result is an essential reference for understanding the formulation of national security policies during the first administration of Richard

Nixon. Those wanting to know more about the rest of Laird's life and career can consult *With Honor: Melvin Laird in War, Peace, and Politics*, by David Van Atta.

The central theme of Hunt's comprehensive account is the strained relationship between Laird and the White House, epitomized by Laird's bureaucratic battles with Nixon's Assistant for National Security Affairs, Henry Kissinger. Because Nixon had been desperate to recruit a SecDef after being turned down by hawkish Democratic Senator Scoop Jackson, Laird was able to demand a degree of independence enjoyed by few other cabinet secretaries in the postwar era. This included authority to choose all his civilian and military officials without White House interference (which was reluctantly adhered to) and for his office to be the focal point for all significant communications between the White House and his department (frequently violated).

Six of the twenty chapters cover the war in Vietnam, which Hunt (author of *Pacification: The American Struggle for Vietnam's Hearts and Minds*) was well qualified to write. Laird, more than any other top official in the Nixon Administration, was attuned to the worsening public and political opposition to the war. Indeed, he considered the deteriorating conditions on the home front to be a greater threat to national security than failing to achieve a victory over North Vietnam. In response, he was the chief architect and proponent of "Vietnamization," doing his best to build up South Vietnam's military capabilities while orchestrating an inexorable drawdown of U.S. forces (which went from 540,000 to fewer than 24,000 during his four years). He also began restoring America's essential commitment to NATO, which had taken a back seat to the sideshow in Southeast Asia since the mid 1960s. Laird's reluctance to condone strong countermeasures against North Vietnamese aggression led Nixon and Kissinger to bypass him in the chain of command. Instead, the White House communicated covertly with the Joint Chiefs of Staff and commanders in the Pacific to plan and conduct various operations, most notably the decisive American response to the Easter Offensive in 1972. Three years later, in the wake of Watergate and the cutoff of American logistical and air support to the Republic of Vietnam by a war-weary U.S. Congress, another such rescue was no longer possible.

Five chapters focus on the convoluted but critical programming and budgeting process, over which Laird's experience as chairman of the House Defense Appropriations Subcommittee gave him a degree of



mastery unmatched by any other SecDef. He was able to stonewall Kissinger's efforts to bring budget planning and force structure under the aegis of his Defense Program Review Committee and fend off many cost-cutting initiatives by the Office of Management and Budget. Meanwhile, Laird's fiscal expertise and his continuing influence with former congressional colleagues of both parties were indispensable in mitigating the effects of shrinking appropriations and maintaining a baseline of capabilities needed to meet future Cold War challenges. A reader not interested in the minutiae of formulating annual budgets could glean enough about the overall results by reading only the introductions and concluding summaries for each of these chapters.

Because Vietnamization ultimately failed to prevent a communist victory, Laird's most enduring legacy—what Hunt calls his “signal accomplishment”—was creation of the All-Volunteer Force (AVF). Achieving this was closely entwined with phasing out the divisive and inequitable selective service system, which in turn relied upon the steady withdrawal of American troops from Vietnam, which was itself driven by the military personnel funds available in Laird's defense budgets. The transition to the AVF also helped defuse the problems of racial strife, drug use, and breakdowns of discipline in the ranks. Even though Nixon and Kissinger were frustrated by their inability to slow down Laird's removal of combat forces, Hunt believed that Nixon's overwhelming political victory in 1972 “owed much to Laird's handling of the withdrawals and the end of conscription.” Other lasting changes spearheaded by Laird included expanding opportunities for women and reinvigorating the guard and reserve components as key pillars in what he dubbed the “total force” concept.

Because Laird largely delegated administrative and technical responsibilities to Silicon Valley pioneer David Packard, his perfect choice as Deputy SecDef, the book has only limited coverage of new weapon systems except in the context of their funding. Nor are there many details about the significant reforms to the acquisition process made during Laird's tenure. The book well describes his strong support of the anti-ballistic missile system and his role in negotiations for the Strategic Arms Limitations Treaty (SALT). Yet the National Security Agency and Defense Intelligence Agency—both important for verification of SALT's provisions—are only referred to in passing. The National Reconnaissance Office, which was secretly developing and deploying remarkable satellites that would be key to

“the national technical means” for monitoring Soviet capabilities, is not mentioned even once. Other than those omissions, I can think of few other nits to pick with this impressive addition to the historical record of national defense policy.

*Lawrence R. Benson, retired USAF historian, Albuquerque, New Mexico.*



**To Kill Nations: American Strategy in the Air-Atomic Age and the Rise of Mutually Assured Destruction.** By Edward Kaplan. Ithaca NY: Cornell University Press, 2015. Photographs. Notes. Index. Pp. 260. \$39.95 ISBN 978-0-8014-5248-2

In his latest book, Edward Kaplan skillfully examines the conceptual context behind an overlooked period of American strategic thought: the air-atomic age where the U.S. Air Force explored how to fight and win a nuclear war with the Soviet Union. A shocking concept today, where nuclear war is assumed to be the end of civilization, Kaplan's study of air-atomic strategy traces the evolution of the ideas, technology, personalities, organizations, and policies from 1945-1963. In eight thematic chapters, he analyzes the evolution of strategic thought from early air power theory, World War II bombing campaigns that forged the USAF, the era of American atomic monopoly, and the fundamental changes generated by increasing nuclear stockpiles, the growing Soviet threat, and altered perceptions where deterrence and stability replaced victory. Kaplan argues that air-atomic strategy (the term used in early Cold War planning documents) formed the core of Air Force thinking, organization, and identity: “Atomic weapons first enabled airpower and the Air Force and then enslaved them.”

Although Edward Kaplan resists the urge to paint legendary air leaders as Strangelovian stereotypes, he critiques their ironic vision of the Strategic Air Command (SAC), a finely tuned instrument for a blunt annihilation mission. Stressing SAC's pragmatism, Kaplan explains the incremental changes to emergency war plans, initially based on atomic scarcity, eventually resulting in SIOP 62, the penultimate overkill that shocked the Kennedy administration with its “go/no go” inflexibility and lack of policy options. In Kaplan's analysis, the Air Force focus on providing a war-winning force fit the policies of the Truman and Eisenhower administrations. SAC's goal of limiting

American casualties by rapidly destroying Soviet industrial and, later, nuclear capability enhanced early concepts of deterrence. On the other hand, fundamental changes in the strategic environment rendered the Air Force vision unsuited, morally objectionable, and absurd to the realities faced by Kennedy and McNamara.

Strong in examining the policy and political rationale of early Cold War presidential administrations, Kaplan adds a nuanced look at the organizational dynamics of the U.S. armed services competing for influence and budgets. He provides a fresh look at the “Revolt of the Admirals” over the B-36 and a fascinating chapter, “The Compression of Time,” where SAC struggled with Soviet advances in atomic and missile technology: “By the end of the 1950s, SAC was well positioned to launch a first strike, but not to absorb one. Its efforts to overcome this dilemma led it to a razor edge of preparation and a policy which required politicians to be willing to destroy the world on a hair trigger.” With its experienced-based, problem-solving mindset, SAC focused on specific technical challenges and missed the greater political and social implications of overkill. Kaplan shows SAC unable to respond conceptually to challenges raised by civilian theorists (Bernard Brodie, Herman Kahn, Henry Kissinger, and others), the Navy's finite deterrence embodied in the Polaris submarine-launched ballistic missile, and by the Army's ideas of limited war voiced by Maxwell Taylor. Kaplan credits the McNamara and Kennedy team for recognizing a different world of the 1960s, but also Eisenhower's shrewd manipulation of the existing SAC deterrent for actual crises faced in the 1950s. Although not shy to point out flaws of logic and imagination, Kaplan concludes: “In the end the system worked. Between 1945 and 1963, Americans made rational decisions about nuclear forces which were well suited to their time and emerging trends. Responsible men made good decisions about hard issues.”

*To Kill Nations* features superb research combining astute summaries of nuclear deterrence literature with extensive, pioneering primary sources drawn from the National Archives; Library of Congress; Air Force Historical Research Agency; and the Truman, Eisenhower, Kennedy, and Johnson Presidential libraries. Kaplan mines the personal and professional correspondence of Curtis LeMay, Thomas Powers, Nathan Twining, Robert McNamara, and other senior leaders to great effect. Balanced and fair, he captures their perspectives and shows senior leaders capable of serious thought, if not always open to new paradigms.

Carefully documented, useful footnotes aid the reader, but the publisher's decision not to provide an academic bibliography punishes the serious researcher.

This book is bold and thoughtful and fills an important gap in strategic studies of the Cold War. It complements Lawrence Freedman's classic *The Evolution of Nuclear Strategy* and extends the fine work of Conrad Crane, Tami Davis Biddle, and Mark Clodfelter. Drawing upon his career as an Air Force intelligence officer and associate professor in the Department of History at the Air Force Academy, Kaplan achieves a rare balance of perspectives—civilian and military, academic and practitioner, and policymaker and commander. This is a must read for the serious student of the Cold War, airpower history, military innovation, and interservice rivalries. Kaplan not only explains the thinking of a vital era of strategic history, but also suggests parallels for today. To what extent does a version of air-atomic thinking pervade strategic thought in emerging nuclear powers?

*Dr. John T. Farquhar, Lt. Col., USAF (Ret.)*



**Viking Spitfire: The Story of Finn Thorsager.** By Tor Idar Larsen and Finn Thorsager. Charleston SC: Fonthill Media, 2012. Photographs. Notes. Appendix. Pp. 191. \$24.95 ISBN: 978-1-78155-043-4

Norway was pulled into World War II early in the morning of April 9, 1940, when German forces attacked that neutral nation, beginning an occupation that lasted five years. *Viking Spitfire* is the story of Norwegian Air Force pilot Finn Thorsager, who was sent aloft to investigate the reported presence of hostile aircraft over Norway on April 9 and had the distinction of being the first Norwegian pilot ever to fire shots in wartime.

Co-authors Thorsager and Larsen never met. Most of the narrative is provided by Larsen, but it is interspersed with lengthy first-person accounts by Thorsager, apparently taken from his letters and journals. Larsen skillful created an interesting, highly readable account of a wartime fighter pilot's experiences. The book's readability is somewhat remarkable given that it was translated into English from Larsen's native Norwegian and appears to have lost nothing in translation.

Immediately following the invasion, Thorsager was stricken with pleurisy, a lung infection that kept him bedridden for several months. After recovering, he joined many other young Norwegian men who

decided to leave their country, headed either to England or to Canada in order to join the fight against Germany. Thorsager's walked to Sweden, flew to Riga and Moscow, took the trans-Siberian railway to Vladivostok, traveled by sea to Japan and southern California, and then rode by train to Toronto. With several lengthy stops along the way awaiting transport, it took Thorsager nine months to complete the 13,000-mile trek.

Near Toronto, a camp known as "Little Norway" had been established to develop and train a new Norwegian air force. The Royal Norwegian Air Force totaled 2700 men by war's end and operated four squadrons. Because of his previous flying experience, Thorsager served as an instructor for five months before deploying to England.

In Great Britain, Thorsager did most of his flying in Hurricanes and Spitfires, a significant step up from the obsolescent Gladiators he had flown before the war. He served at several different bases in England and saw extensive combat action. One of the best passages in the book is Larsen's account of the allied attack on the German-occupied French port of Dieppe in August 1942. As one of more than 60 squadrons supporting the amphibious landing, Thorsager's unit flew four non-stop combat missions in one grueling day. Larsen superbly captures the feel of the aerial combat and describes what the landing looked like from the air. With 60% of the landing force killed, wounded, or captured, Dieppe was a disaster. But senior Allied commanders believed it provided valuable lessons that saved lives and contributed to success in the Normandy invasion 22 months later.

In early 1943 Thorsager was given command of 332 Squadron, a position he held for five months before being ordered back to Canada for a mandatory rest period. Upon returning to flying duty, he flew Lodestars and other transports, with many of the missions involving long-duration flights to make clandestine deliveries of high-priority personnel and cargo. Some of Thorsager's night flights in abysmal weather seemed to be more challenging than many of his combat missions.

The book concludes with an account of Thorsager's post-war career as a senior captain with Scandinavian Airlines, but the emotional end of the story comes before that. In May 1945, a week after Victory-in-Europe day, Thorsager flew into Norway for the first time in nearly five years. Unable to contact his parents in advance, he left the airfield and arrived at their home unannounced, late at night. Upon seeing his son, Thorsager's father went down to the basement and recovered

a bottle of champagne he had set aside the day Finn set off on his journey to Canada, vowing to save the bottle until the younger man returned. Larsen's description of this homecoming is a fitting close to Thorsager's wartime story and a fitting close to a book that is well worth the read.

*Lt. Col. Joseph Romito, USA (Ret.),  
Docent, NASM's Udvar-Hazy Center.*



**Whitey: The Story of Rear Admiral E.L. Feightner, A Navy Fighter Ace.** By Peter B. Mersky. Annapolis: Naval Institute Press, 2014. Photographs, Maps. Appendices. Notes. Index. Bibliography. Pp. 185. \$39.95 ISBN: 978-1-61251-791-9

Admiral Feightner was a nine-kill World War II ace who flew Wildcats and Hellcats off carriers in the early, desperate days over Guadalcanal and, later, during the Central Pacific drive. After the war he test-flew such early carrier jets as the F2H, F4D, F7U-1, and F8U. Feightner commanded VF-11 in the mid-fifties and later Carrier Air Group 10 aboard *USS Essex* (CV-9) and *USS Coral Sea* (CV-43). After serving as commanding officer of *USS Chikaskia* (AO 54) and *USS Okinawa* (LPH-3), he assumed senior positions ashore. Feightner also served with—and absorbed valuable lessons from—such famous Navy personalities as Butch O'Hare, Swede Vejtasa, and James Flatley. Assiduous, quick-learning, talented, and affable in manner, he had the ability to win trust and reconcile opposing points of view. He developed officers and enlisted sailors alike in his commands and left his mark as a combat ace, test pilot, and leader of exceptional skill.

A career Navy veteran, Peter Mersky is a prolific and skilled writer on naval aviation subjects. He has written sixteen books, including *U.S. Marine Corps Aviation since 1912*; *The Grim Reapers: Fighting Squadron Ten in WW II*; and *Time of the aces: Marine pilots in the Solomons, 1942-1944*. Mersky edited the naval safety magazine *Approach* and is the book review editor for *Naval Aviation News*. This is his first biography.

Biographers largely have neglected Feightner until now. The only other work thus far is a chapter in E.T. Wooldridge's *Carrier Warfare in the Pacific: An Oral History Collection*. The history of the carrier war in the Pacific is a growth industry these days; internet searches reveal dozens of recent titles. Then again there's always the redoubtable basic history by Samuel Eliot Morrison.

Feightner's career was anything but



dull. For over ten years, he was in dangerous flying jobs, first in heavy combat in the Pacific, and later testing early jets featuring design innovations more ambitious than proven. His unfailingly sunny outlook never failed. As he advanced in rank Feightner drew Pentagon assignments that inevitably involved him in politics, often with such charismatic individuals as Hyman Rickover and Elmo Zumwalt. But he easily translated his cockpit-honed skill at maintaining his composure to a staff environment.

Unfortunately the book read in a few places as though editing was cut short to make a publication deadline. I detected at least two errors. The carrier Yorktown (CV-5), heavily damaged at the Battle of Midway, is incorrectly described as scuttled by a U.S. destroyer, when it actually was sunk by an enemy submarine. It also says that Chiang Kai-shek and Mao Tse-tung “fought the Japanese together.” Both certainly opposed the Japanese, but definitely not together. Every now and then ideas were tantalizingly introduced but not explored. For example, Mersky asserts that Feightner was “right in the middle” of the creation of a comprehensive naval aviation safety program in the late 1950s. However, there is no subsequent discussion of this significant development—a major initiative of those years.

The bibliography is a bit thin in areas. Only an oral history on file at the U.S. Naval Institute and interviews with Feightner are cited for some topics that otherwise are well covered in archival collections and published literature. For instance, Feightner worked on the projected naval version of the F-111, one of the most extensively documented aircraft in history. Yet I found no other original or secondary source citations for this passage.

Bound in cloth on archival-quality paper, the book is illustrated with photos, tied closely to the text, supplied by Feightner, fellow naval aviators, and archival sources. The index is thorough, and the appendices list Feightner’s assignments and planes he shot down.

This book is a colorful, action-oriented, and instructive read. I gained a clear picture of Feightner’s studious, steady personality and quiet but effective leadership characteristics and recommend it especially for those aspiring to leadership positions.

Steve Agoratus, Hamilton, New Jersey.



## Airpower Reborn: The Strategic Concepts of John Warden and John

**Boyd.** By John Andreas Olson, ed. Annapolis MD: Naval Institute Press, 2015. Tables. Diagrams. Notes. Bibliography. Index. Pp. xii, 239. \$49.95 ISBN: 978-1-61251-804-6

John Boyd and John Warden are arguably two of the most influential military thinkers of the second half of the twentieth century. Their ideas have been discussed, argued about, ignored, and incorporated consciously and unconsciously into the operations and doctrines of militaries around the globe. They have been controversial both for their personal approaches (which could be condescending and dismissive of dissent) and their common Air Force heritage. Some people lump them with Douhet, Mitchell, and Trenchard as dreamers or proselytizers long on promises and short on results. A diverse group of airpower scholars seeks to inform the reader about Boyd and Warden’s theories, place them in context, and then provide a usable framework for further development of the concept of strategic paralysis.

Olsen is a Norwegian Air Force officer with a theoretical bent and an interest in advancing the concepts of his predecessors. His coauthors are distinguished airpower historians and thinkers, including Warden himself, who provide their own perspectives on the topic. Olsen’s thesis is that warfare—and specifically air warfare as it contributes to the whole—should focus not on attrition but strategic paralysis. He and his coauthors argue that regardless of the circumstances (conventional or irregular warfare), militaries and governments are still locked into a paradigm focused on destroying men and equipment. They see this as wasteful and failing to take advantage of both modern technology and thinking. They believe affecting the enemy as a system is the most efficient way to create the desired end state. They use Boyd’s OODA (observe, orient, decide, act) loop and Warden’s five-rings targeting concept but discuss them beyond what they see as the oversimplification of both ideas in common use. The discussion is sound and shows a good grasp of both the theories involved and their application. The result, as described by Colin Gray in the final chapter, is “theory presented in the form of many dicta” to enhance “clarity, accuracy and practical utility.” Gray is quite clear he doesn’t consider this complete or final, as any theory is always subject to revision. Airpower advocates may find some of his dicta difficult to accept, as they strike at the heart of long cherished beliefs (airpower is inherently strategic for example), but his explanations are compelling and merit consideration.

The book is densely packed with theoretical concepts. Clausewitz and Jomini figure prominently, as Boyd and Warden’s concepts are seen as intellectual descendants of these two thinkers. Prominent early airpower thinkers such as Douhet, Mitchell, and Trenchard are mentioned, while other influential thinkers such as John Slessor and William Sherman receive passing notice. One interesting omission is the failure to even mention Alfred Thayer Mahan’s early twentieth century theory of sea control. Mahan is included in the bibliography but never cited in the text. Even if the authors didn’t feel Mahan’s ideas impacted Boyd, Warden, and airpower theory in general (a view I contest), his impact elsewhere merits at least mention of why his ideas were not relevant. Another interesting omission is any mention of effects-based operations, a concept that focuses not on the weapons used but the desired effects. This concept dovetails with a focus on end results versus force-on-force tactics but is apparently not something the authors considered.

This is a tremendously useful book, although I am afraid its title will limit its appeal to airpower enthusiasts and theorists. But a couple of cautions are warranted. Chapters 3 and 4 take on a somewhat proselytizing tone (chapter 3 is written by Warden, so this is no surprise). Olsen and Gray both comment in different places that this book seeks to avoid preaching and the extravagant claims that have harmed the arguments of airpower theorists in the past. Allowing this to creep in does not help the book’s argument. Finally, there are so many different theories and theorists referenced with very limited discussion of most, this book should be read only after becoming more familiar with the foundational texts. As a minimum, readers should start with Warden’s *The Air Campaign*.

Unfortunately, Boyd never produced his theories in book form, so readers must rely on one of several works discussing him and his theories. Grant’s *The Mind of War* looks at Boyd’s strategic and energy maneuverability theories and their impact on security strategy and the development and procurement of the F-15 and F-16 fighters. Coram’s *Boyd* is a study of the man and borders on hagiography but has a good explanation of his ideas. Another good option discussing both theorists is Fadok’s *John Boyd and John Warden: Air Power’s Quest for Strategic Paralysis*. Additional suggested reading would include Clausewitz, Jomini, Douhet and Mitchell as well as Phillip Meilinger’s *The Paths of Heaven: The Evolution of Airpower Theory*, an excellent and com-

prehensive discussion of the development of airpower theory. If this looks like a daunting list, it is. The authors of *Airpower Reborn* cover a lot of ground; keeping up with them can be challenging. At the end of the day though they succeed in their goal of moving the discussion of airpower forward. Despite its few shortcomings and the price tag, this is a book strategists from any service should read.

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



**Images of America: The Oregon Air National Guard.** By Terrence G. Popravak Jr. and Sean M. Popravak. Charleston SC: Arcadia Publishing, 2012. Photographs. Bibliography. Pp. 128. \$21.99 ISBN: 978-0-7385-9312-8

Terrence Popravak, an Oregon Air National Guard (ORANG) veteran, and his son Sean have tapped official files, veterans, co-workers, and friends to access photos and memories long stored in footlockers and albums to assemble this pictorial history.

Starting as the 123rd Observation Squadron, the ORANG was called into federal service in September 1941. Following Pearl Harbor it flew anti-shipping and submarine patrols off the Pacific Northwest coast in O-47s. As the 35th Photographic Reconnaissance Sq, the unit flew F-5 aircraft in the China-Burma-India theater from September 1944 to war's end. As the 123rd Fighter Sq, the Oregon Air National Guard was subsequently expanded as the 142nd Fighter

Group in 1946. Thereafter the unit followed the usual Cold War pattern of aircraft assignments, with P-51, F-86, F-94, F-89, F-102, F-101, F-4, F-16, and F-15 aircraft all passing through in their time in fulfillment of the air defense role. Called again into federal service during the Korean War, the 142nd contributed aircraft and pilots to combat. With the Cold War over, the ORANG, assigned the 173rd Fighter Wing as well, now participates in such Total Force expeditionary taskings as no-fly zone patrols over Iraq and interoperability deployments with NATO allies. Associated units such as the 104th and 116th Air (Tactical) Control Squadrons, 142nd Consolidated Aircraft Maintenance Squadron, and 142nd, 221st and 244th Radio Relay (Mobile Communications) Squadrons are not given short shrift.

The previous work on the ORANG was Turner Publishing's *Guardians of The Pacific Northwest - Oregon Air National Guard - A Commemorative History, 1941-1991*. Charles Gross is the leading authority on the Air Guard. Among his many works are *A Chronological History of the Air National Guard and its Antecedents, 1908-2007* and *Militiaman, Volunteer, and Professional: The Air National Guard and the American Military Tradition*. Rene Francillon's survey *The United States Air National Guard* is very informative. These works provide context to overall ANG history, structure and activities. There are many other books on individual aircraft types and ANG units.

Arcadia's Images of America series format is almost undeviating: paperback; high-quality paper; heavy on photos; and no index, endnotes, or footnotes.

Editorially, the focus is on people as a community in a particular time, place, or organization. Bibliographies are inevitably brief; photos are not credited, although captions are revealing as to sources.

Despite these strictures, the authors have composed a thoughtful picture of the ORANG as an Air Force unit. Depicted are such notable events as summer camps, local disaster and humanitarian aid projects, celebrity visits, open houses, parade flyovers, unit retirements, change-of-command ceremonies, award formations, and deployment homecomings. The focus is on Air Force people, their background, and the pride they take in their work.

Although each chapter opens with a one page brief, little or no context is provided on the ORANG as it relates to other ANG outfits. As this unit's prime mission has always been air defense, a picture or two of an actual intercept would have fit in nicely. A number of photo captions discuss aircraft color schemes. Unfortunately the format dictates all black and white photos. I missed the usual accompaniments of a military history—maps, campaign chronologies, unit hierarchy diagrams.

Although best regarded as a photo annex to one of the fuller histories by Gross or Francillon, this book nonetheless is a good work to browse for a quick, fairly comprehensive look at this storied Air National Guard unit.

*Steven Agoratus, Hamilton, New Jersey.*



## Guidelines for Contributors

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](mailto:airpowerhistory@yahoo.com).



## Books to Review

Dorr—365 Aircraft You Must Fly: The Most Sublime, Weird, and Outrageous Aircraft from the Past 100+ Years.  
Dye—The Bridge to Airpower: Logistics Support for Royal Flying Corps Operations on the Western Front, 1914-18.  
Graff—P-51 Mustang.  
Lieback—History of Rocketry and Astronautics, Vol 42.  
MacLeod—Gallipoli: Great Battles Series.  
Mahoney—Bombing Europe: The Illustrated Exploits of the Fifteenth Air Force.  
Okerstrom—Dick Cole's War: Doolittle Raider, Hump Pilot, Air Commando.  
Prodger—Trending Collectibles 2015 Military Aviation Review WW1-WW2.  
Reinke—History of Rocketry and Astronautics, Vol 43.  
Rosano—Striking the Hornets' Nest: Naval Aviation and the Origins of Strategic Bombing in World War I.  
Stouffer—Swords, Clunks & Widowmakers: The Tumultuous Life of the RCAF's Original I Canadian Air Division.

### 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:

Col. Scott A. Willey, USAF (Ret.)  
3704 Brices Ford Ct.  
Fairfax, VA 22033  
Tel. (703) 620-4139  
e-mail: [scottlin.willey@gmail.com](mailto:scottlin.willey@gmail.com)

## History Mystery Answer

In 1940, the Royal Air Force was critically short of pilots. American businessman Charles Sweeney proposed the idea of American pilots flying British aircraft for the Royal Air Force. On July 2nd, 1940, the British Air Council approved the idea provided Sweeney had twenty-five pilots and twenty-five reserve pilots available. Sweeney was able to produce the pilots. Later Sweeney designed the new unit's shoulder patch (seen as XXX) which consisted of an American Eagle similar to that on an U.S. Passport. Upon seeing the patch, Charles' father came up with the name American Eagle Squadron (AES). AES was later shortened to Eagle Squadrons. Flying the Hawker Hurricane, RAF No. 71 Squadron became the first of the three Eagle Squadrons (No. 71, 121, and 133 Squadrons) and became combat ready in January 1941. Flying Hawker Hurricanes and Supermarine Spitfires, the Eagle Squadrons flew combat over Europe from Feb 1941 until September 1942 when they were transferred to the Army Air Forces, where they formed the 4th Fighter Group. Today, the 4th Fighter Wing carries on the proud heritage of the Eagle Squadrons while flying F-15E Strike Eagles at Seymour Johnson AFB, North Carolina. To learn more about the Eagle Squadrons, go to

[www.nationalmuseum.af.mil/Visit/MuseumExhibits/FactSheets/Display/tabid/509/Article/196915/eagle](http://www.nationalmuseum.af.mil/Visit/MuseumExhibits/FactSheets/Display/tabid/509/Article/196915/eagle): or

[www.afhso.af.mil/shared/media/document/AFD-100928-005.pdf](http://www.afhso.af.mil/shared/media/document/AFD-100928-005.pdf)



# Coming Up



Compiled by  
George W. Cully

#### January 4-8, 2016

The **American Institute of Aeronautics and Astronautics** will host its premier annual event, Sci-Tech 2016, at the Manchester Hyatt Hotel in San Diego, California. For details, see the Institute's website at [www.aiaa.org/Forums/](http://www.aiaa.org/Forums/).

#### January 7-10, 2016

The **American Historical Association** will hold its 130th annual meeting at the Hilton Atlanta Hotel in Atlanta, Georgia. Noted WWII historian Rick Atkinson will deliver the George C. Marshall Lecture at the gathering on January 9; his theme will be "Projecting American Power in the Second World War." For particulars, see the Association's website at <http://historians.org/annual-meeting>.

#### February 11-13, 2016

The **Air Force Association** will host its 32nd annual Air Warfare and Technology Exposition at the Rosen Shingle Creek Hotel and Convention Center in Orlando, Florida. For more information, see the Association's website at [www.afa.org/air-warfare/home](http://www.afa.org/air-warfare/home).

#### March 5-12, 2016

The **Institute of Electrical and Electronics Engineers**, in collaboration with the **American Institute of Aeronautics and Astronautics** and the **Prognostics and Health Management Society** will host the 37th annual IEEE Aerospace Conference at the Big Sky Conference Center in Big Sky, Montana. For particulars, see the conference website at [www.aeroconf.org/](http://www.aeroconf.org/).

#### March 8-10, 2016

The **American Astronautical Society** will host its 54th annual Robert H. Goddard Memorial Symposium in Greenbelt, Maryland. For more specifics, see the Society's website at <http://astronautical.org/>.

#### March 10-12, 2016

The **Vietnam Center and Archive** at Texas Tech University and the Uniformed Services University of the Health Sciences Army Medical Department Center of History and Heritage will sponsor a conference entitled "A Medical History of the Vietnam War." The event will be held at the Doubletree Hotel in

San Antonio, Texas. For further details, see the Center's website at [www.vietnam.ttu.edu/news/?p=2555](http://www.vietnam.ttu.edu/news/?p=2555).

#### March 16-19, 2016

The **Society for History in the Federal Government** and the **National Council on Public History** will co-host their 2016 meeting at the Renaissance Baltimore Harborplace Hotel in Baltimore, Maryland. The theme of this year's gathering is "Challenging the Exclusive Past." For details, see the Society's website at [shfg.org/shfg/events/annual-meeting/](http://shfg.org/shfg/events/annual-meeting/).

#### 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/](http://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](http://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](http://www.smh-hq.org).

#### 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](http://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](http://www.xponential.org/auvsi2016/public/enter.aspx).

#### 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](http://www.vtol.org/annual-forum).

#### 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>.

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](mailto: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

**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

**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

**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

## Classes

**PTC-56M.** Oct 19-22, 2016, Fairborn, Ohio. Contact:

John Mitchell  
11713 Decade Ct,  
Reston, VA 20191  
703-264-9609  
mitchelljf@yahoo.com

**PTC-65C.** Sep 27-30, 2016, Dayton/Fairborn, Ohio. Contact:

Jim Folsom  
447 Navajo West,  
Lake Quivira, KS 66217  
913-268-6104  
folsom447@att.net

**UPT 66-E (Reese AFB).** May 3-5, 2016, Fairborn, Ohio. Contact:

Phil Jack  
106 Parmalee Dr,  
Hudson, OH 44236-3428  
330-653-8919  
jach@gwis.com

**UPT Class 67C (Webb AFB).** Oct 20-23, 2016, Fairborn, Ohio. Contact:

Mike Trahan  
1014 Lansing St,  
West Orange, TX 77630  
409-920-8680  
mtrahan33@gmail.com

**UPT Class 73-08 (Reese AFB).** Apr 7-8, 2016, Fairborn, Ohio. Contact:

Jim Davis  
P.O. Box 1466  
Athens, TX 75751  
903-729-8046  
jim.davis@wfadvisors.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

## **Bernard C. Nalty** **(1931-2015)**



Mr. Bernard C. Nalty, the most prolific historian of the Office of Air Force History to date, died August 19, 2015, of cardiac arrest at a nursing home in Woodstock, Maryland following a series of strokes that began in December 2013. Bernard C. Nalty was born on June 13, 1931, in Omaha, Nebraska. He received a BA from Creighton University in 1953, and following two years of military service as an officer with the United States Army he attended The Catholic University of America in Washington D.C. receiving an MA in American History in 1957. In the meantime in December 1954, he married Barbara Kathryn (Watke) a union that produced five children.

He began his historical career as a civilian historian for the U.S. Marine Corps Headquarters in Washington, D.C. where he was employed from 1956 to 1961. He then worked at The Joint Chiefs of Staff Historians Office also in Washington D.C. where he remained until 1964. That same year he joined the Office of Air Force History where he labored in various management and historical writing capacities until his retirement in December 1994.

He was respected by his peers from the Military History Programs and other historical offices both in the Washington D.C. area and outside offices as being an excellent and productive historian and writer. His list of publications include more than thirty-seven books that were either written solely by him or co-authored.

In addition, he wrote many articles and book reviews. He was an

expert on Air War in Vietnam and while a complete list of his publications will not fit in this allowed space the file would include *Air Power and the Fight for Khe Sanh*; *The Air War over South Vietnam 1968-1975*; *The War Against Trucks*, and *Aerial Interdiction in Southern Laos 1969-1972*. All these were published by the Office of Air Force History. And it was Bernie Nalty who edited the two volume *Winged Shield Winged Sword—A History of the United States Air Force, Volume I. 1907-1950, Volume II. 1950-1997* in which he melded the works of fifteen authors into a compatible and readable format. He also wrote with Wayne Thompson *Within Limits: The U.S. Air Force and the Korean War*; and with Alfred Beck, Col. John Shiner, and George Watson, *With Courage: The Army Air Forces in World War II*.

He wrote many books on his own initiative for private publishers. He was most proud of *Strength for the Fight—A History of Black Americans in the Military*. His book *Aircraft of the Southeast Asia Conflict—An Illustrated Guide to the Air War Over Vietnam* published in the early 1980s preceded a series of outside sources dealing the Vietnam War. While with the Marine Corps he wrote, with Henry Shaw and Edwin Turnbleth, *The History of the U. S. Marine Corps Operations in World War II, Volume III, Central Pacific Drive*. Upon retirement from the Office of Air Force History he would write many books on divergent subjects to include several volumes about Marine Corps History.

As Chief of the Histories Division and as a Senior Historian at the Office of Air Force History he was a renowned mentor and editor, assisting younger and less experienced writers with their manuscripts and encouraging them with their research and writing efforts with statements such as the “way to improve one’s writing was to keep on writing.” In addition, he also assisted many outside researchers seeking information about his works and that of the Office of Air Force History.

Bernie also possessed a tremendous sense of humor and wit and could make most people laugh or more importantly disarm a difficult situational exchange into a less severe encounter. He had the ability to get people to relax or better yet take a second look to perhaps visualize themselves less gravely. He was at times cynical yet he could always dampen harsh critical statements (made either by him or others) with his witty sense of humor.

The Air Force History Program was most fortunate to have had Bernard C. Nalty as one of its historians for nearly thirty years. With his passing the Military Historical establishment lost an exemplary human being and an exceptional and a genuinely professional historian.

*George M. Watson, Jr., Ph.D. Senior Air Force Historian—Retired.*



## Daniel R. Mortensen (1938-2015)



Dr. Daniel Mortensen, an Air Force historian and retired Dean of Research at the Air Force Research Institute, died unexpectedly on October 15, 2015, at his home in Montgomery, Alabama. Dan was born in Provo, Utah and moved to Salt Lake City where his father was a college professor at Brigham Young University. Dan was the oldest son of a family that included six children. He later moved to Southern California where he attended local schools and received his B.A. and M.A. degrees at University of California Riverside and a doctorate in 1976 from the University of Southern California (USC). While matriculating for his doctorate he was a full time high school teacher and following his Ph.D. studies he was an instructor at various California institutions to include USC, Pepperdine, and Loyola.

His first marriage produced two daughters and to supplement his income he worked in the grocery business, eventually earning a part time retirement from that endeavor. With his Ph.D. in hand and still working in the produce department at the grocery store he was often referred to as “Dr. Dan the Produce Man.”

In the meantime he married Maya (Naning) Mortensen on December 1st 1977.

Prior to coming to Washington D.C. as a member of the Office of Air Force History in 1981, he served as deputy command historian at the Air Force Communications Command at Scott Air Force Base, Illinois. At the Office of Air Force History, he labored in various his-

torical capacities for eighteen years specializing in Tactical Air and in 1987, wrote a monograph for the Army's Center of Military History Historical Analysis Series entitled *A Pattern for Joint Operations: World War II Close Air Support North Africa*. In addition to writing chapters in books, articles for various journals and book reviews he organized and managed the initial Chief of Staff's Professional Reading Program which became known as the Chief's Reading List. He was also invited to attend and participate in the proceedings of the Chief's Group morning staff meetings where his opinions were welcomed and accepted.

In October 1999, he transferred to Maxwell Air Force Base in Montgomery, Alabama, as CADRE's Chief of Research, Airpower Research Institute at the Air University's Air Force Research Institute where he hired researchers and mentored and encouraged them with their projects as well as initiated staff rides to Normandy's D-Day landing sites and other battlefields to explain airpower's role. In addition, he also conducted staff rides to North Georgia, to walk the Chickamauga battlefield with Air Force leaders where he expounded on lessons of military history. He remained in that capacity at Maxwell AFB until 2008, when he became the new Air Force Research Institute's first Dean of Research, a position he held until his retirement in July 2013. The citation on his retirement gift of an original painting of “One Hundred Years of Airpower” perhaps best described Dan—“Scholar, Leader, Mentor, Researcher.”

On a lighter note Dan besides being a runner and a weight lifter, was a great cook, always making pies for office gatherings and reminding the attendees that he was related to the owner and producer of the original Mrs. Smith's pies. Dan was a man of many interests and consistently liked taking on something new. In Washington, he studied on auto body work repair and subsequently applied this knowledge to preserving his 1960's vintage Volkswagen. Whether it was building patios or adding new shrubs and flowering trees to his property he always seemed to have a project on the side. And of course Dan and Maya's love of animals was nearly legendary—at one time six dogs, squirrels and raccoons were all welcomed and well fed at the Mortensen's home in Alabama.

Dan possessed a pleasing personality and could spread his enthusiasm to others. He was well liked, vibrant and was a most kind man who personally concerned himself with other people's issues. If there was ever a man who was born to assist his fellow human beings it was Daniel R. Mortensen.

*George M. Watson, Jr., Ph.D. Senior Air Force Historian—Retired.*



Seventy five years ago this fall, in 1940, while the United States maintained its neutrality, France had fallen to the invading German army leaving Great Britain to stand alone to fight Nazi Germany. After the retreat from Dunkirk, the Royal Air Force faced a severe shortage of pilots. This person developed the concept of creating an

American Air Defence Corps to assist with Great Britain's Air Defense. Ultimately three squadrons would be created. He would later design the new unit's shoulder patch which would result in the unit's name. Who was this person? And what became the initial name of the unit(s) he helped create?







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



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

Visit Us Online at:  
[afhistoricalfoundation.org](http://afhistoricalfoundation.org)



## AIR FORCE HISTORICAL FOUNDATION MEMBERSHIP FORM

NAME \_\_\_\_\_ PHONE \_\_\_\_\_ E-MAIL \_\_\_\_\_

STREET ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

☐ **Associate Membership (\$25/year) (on-line magazine access)** (Visit our Web site at [www.afhistoricalfoundation.org](http://www.afhistoricalfoundation.org))

☐ **Sustaining Membership (\$45/year)**

GIFT FOR (NAME) \_\_\_\_\_

☐ **Gift Membership (\$45/year)**

☐ **Life Membership (Inquiries to the Foundation)**

ADDRESS \_\_\_\_\_

**Become a Patron or Contributor (Please ask)**

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

\* Non-US recipients please add \$8.00 for postage (See Web site for additional membership options)

☐ **Check enclosed, payable in US Funds to Air Force *Historical* Foundation**

☐ **Please charge my credit card (VISA/MasterCard/Discover)**

CARD NUMBER: \_\_\_\_\_ EXPIRATION DATE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

Send form, along with your remittance to:  
**Air Force *Historical* Foundation**  
**P.O. Box 790**  
**Clinton, MD 20735-0790**



