Besides publishing the quarterly journal Air Power History, the Foundation fulfills a most unique mission by acting as a focal point on matters relating to air power and the history and traditions of the U.S. Air Force and its predecessors. Organizations and those whose lives have been dedicated to preserve and perpetuate the history and traditions of the U.S. Air Force, Flyboys, and John Paul Jones meet to form the Air Force Historical Foundation. Among its many worthy involvements, the Foundation underwrites the publication of meaningful works in air power history, co-sponsors air power symposia with a national scope, and provides awards to deserving scholars.

In 1953, a virtual "hall of fame" in aviation, including Generals Spaatz, Eaker, Vandenberg, Twining, and Foulois, met to form the Air Force Historical Foundation, "to preserve and perpetuate the history and traditions of the U.S. Air Force, Flyboys, and John Paul Jones." Among its many worthy involvements, the Foundation underwrites the publication of meaningful works in air power history, co-sponsors air power symposia with a national scope, and provides awards to deserving scholars.

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Air Force Historical Foundation
Radar Bombing During Rolling Thunder—Part I: Ryan’s Raiders
W. Howard Plunkett

The Unforgettable B–29s: A Tribute
Yang Jing

“Always Above”: Major Edward ‘Mick’ Mannock in World War I
Thomas G. Bradbeer

Book Reviews

The Wings of Change: The Army Air Force Experience in Texas during World War II.
By Thomas E. Alexander. Reviewed by David F. Crosby.

By Wesley K. Clark. Reviewed by Chris O'Sullivan.

First Flight: The Wright Brothers and the Invention of the Airplane.
By Tom D. Crouch. Reviewed by Joseph Romito.

By Stephen M. Duncan. Reviewed by Stephane Lefebvre.

Operation Apollo: The Golden Age of the Canadian Navy in the War against Terrorism.
By Richard Gimblett.

Tolerant Allies: Canada & the United States. 1963-1968
By Greg Donaghy. Reviewed by Carl A Christie.

The Bird is on the Wing: Aerodynamics and the Progress of the American Airplane.
By James R. Hansen. Reviewed by I. B. Holley, Jr.

Talking With the Red Baron.
By Peter Kilduff. Reviewed by H. Larry Elman.

A Preliminary to War: The 1st Aero Squadron and the Mexican Punitive Expedition of 1916.
By Roger G. Miller. Reviewed by Mark A. Johnson.

Stuart Symington: A Life.
By James C. Olson. Reviewed by I. B. Holley, Jr.

The Army of Flanders and the Spanish Road, 1567-1659: The Logistics of Spanish Victory and Defeat in the Low Countries' Wars.
By Geoffrey Parker. Reviewed by Curtis H. O'Sullivan.

Touched with Fire: Presidents and the Civil War Battles That Made Them.
By James M. Perry. Reviewed by Dennis Berger.

50 Years of the U-2: The Complete Illustrated History of the Dragon Lady.
By Chris Pocock. Reviewed by R. Cargill Hall.

One Hundred Years of World Military Aircraft.
By Norman Polmar & Dana Bell. Reviewed by John Braddon.

One Foot on the Ground: A Pilot's Memoirs of Aviators & Aviation.
By Paul Roxin. Reviewed by Bill Nardo.

Books Received

Notice of Annual Meeting

Coming Up

Letters, News, Notices, Reunions

History Mystery
Perhaps you have noticed the photo on the front cover of this issue? It’s the Airmen Memorial Museum, in Suitland, Maryland. There’s a longer range photo of the building on page 59, accompanied by a brief account of its genesis, aims, and a hint of what’s inside the museum. The Air Force Historical Foundation’s leadership is making a determined effort to devote more space to the history of enlisted airmen. We invite our readers to send manuscripts or photographs on this generally neglected topic.

In the lead article of this issue, Howard Plunkett tells the story of radar bombing in Rolling Thunder. Set in the period from 1965 to 1968, USAF airmen employed airborne and ground radar to attack North Vietnamese targets at night and in bad weather. Because of the article’s length, however, we were obliged to split the article. This issue contains Part I and the story will be continued in the summer issue.

Yang Jing, a Chinese military historian, devoted a decade to the study of the Japanese POW camp at Mukden. In the second article, he pays tribute to the sacrifices of the gallant American B–29 aircrews who fought against Axis tyranny in World War II. Included are never before seen photographs of the U.S. Army Air Forces flyers, some who were interned or lost, and some who survived.

In the third article, Tom Bradbeer presents the exploits of Major Edward Mannock, arguably the RAF’s pre-eminent fighter pilot and patrol leader of World War I. After exploding some myths about his subject, the author emphasizes that while Mannock is celebrated for his aerial victories, his more deserved legacy belongs to the tactics he developed and handed down to the RAF’s pilots in World War II.

I’m not sure, but the sixteen books reviewed in this issue (see pages 44-53) may have set a new record for Air Power History. And for you aspiring reviewers, there is a new list of books received (see page 54). Scott Willey is anxious to hear from you. The departments include letters to the editor, upcoming events, news, notices, reunions, and the solution to the “History Mystery.” Also, be sure to note the upcoming annual meeting of the Air Force Historical Foundation (see page 55); we’d welcome the chance to meet you.
Radar Bombing during Rolling Thunder—Part I: Ryan’s Raiders
At 3:03 AM, on January 17, 1991, the 421st Tactical Fighter Squadron (TFS), the “Black Widows,” from the 388th Tactical Fighter Wing (TFW), launched eight F–16 Vipers on a strike against two Iraqi air bases in Kuwait during the opening round of Operation Desert Storm. “Rash” and “Chancer” flights took off before daylight from Al Minhad Air Base, United Arab Emirates. The pilots navigated their Block 40 F–16Cs though darkness using their inertial navigation systems that Global Positioning Satellites updated every two seconds. The planes carried LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) pods that clearly showed the ground terrain and their targets on cockpit displays. Upon reaching their targets, the pilots accurately dropped their loads of anti-tank and anti-personnel mines despite bad weather and being shot at by anti-aircraft artillery (AAA) and surface-to-air missiles (SAMs). At dawn, three hours later, all eight planes landed back at Al Minhad. The power of their F–16s’ navigation and weapon guidance systems gave the 421st their motto, “We own the night.”

The F–16’s capability for night operations stands in stark contrast to the Air Force’s limited ability twenty-four years earlier to strike targets in North Vietnam at night or in bad weather. During Operation Rolling Thunder in 1965 through 1968, pilots in the 388th TFW and the 355th TFW flew F–105 Thunderchiefs from Korat and Takhli Royal Thai Air Force Bases in Thailand. The annual cycle of northern monsoon weather over North Vietnam’s Red River valley during late winter through early spring often prevented F–105 pilots from putting bombs on significant targets around Hanoi. If an F–105 pilot couldn’t see his target, he could not hit it accurately.

The Air Force tried hard, with only limited success, to overcome this technical deficiency during the Vietnam War. Their efforts during Rolling Thunder highlighted the need for the targeting and weapon guidance systems for bombing at night and in bad weather that today’s Air Force employs. This article tells the story of the Air Force’s first-generation all-weather systems and the men who used them for attacking targets in North Vietnam.

The Navy’s A–6A Flew Night and Bad-Weather Missions

A–6A Intruders from VA–75, the “Sunday Punchers” on the carrier USS Independence (CVA–62), flew their first combat mission against North Vietnam on July 1, 1965. The new Intruders gave the Navy a night and all-weather strike capability that was lacking in USAF fighter-bombers.

The Navy learned from their experiences during the Korean War that their attack aircraft needed the capability to hit ground targets in darkness and bad weather. In 1956, the Navy sought bids for such a plane and selected Grumman to produce it. Grumman’s A–6 was subsonic, with a maximum speed of 560 knots, but it could carry a large load of conventional bombs over long distances. It had a capacity for twenty-eight 500-pound bombs and a fuel load that allowed it to reach targets over 1,000 miles away with time to locate its target and drop its bombs before returning home.

The Intruder’s avionics system—DIANE (digital integrated attack and navigational equipment)—provided its night and all-weather attack capability. The key components of DIANE were the APQ-92 search radar, APQ-122 tracking radar for terrain mapping and target location, the APN-141 radar altimeter, the APN-153 Doppler radar, the ANS-31 inertial navigation system, and the ASQ-61 ballistic computer. The A–6 carried a crew of two, a pilot and, to his right, a bombardier-navigator who operated DIANE’s controls for automatically passing steering and bombing instructions to the pilot’s displays.

In the fall of 1965 and into the spring of 1966, as the seasonal monsoons obscured the Hanoi area, the two squadrons of Navy’s A–6As—when they weren’t grounded by their early reliability and supportability problems—were the only planes that could consistently strike targets in this region. The Navy’s capability for attacking targets at night and in bad weather with the A–6A in 1965 gave rise two years later to the Air Force’s attempts to use its F–105s for similar missions.

The F–105—A Nuclear Bomber in a Conventional War

During the late 1950s, while the Navy was developing the A–6A to deliver conventional bombs in bad weather, the Air Force was developing the F–105 to drop nuclear bombs on targets behind the Iron Curtain. Built by Grumman’s Long Island neighbor, Republic Aviation, the F–105 was a supersonic fighter-bomber with an internal bomb bay for carrying a single weapon with provisions for carrying two more nuclear bombs on wing.
The first uses of radar to allow bombing North Vietnam in bad weather were the “pathfinder” missions where EB–66B Destroyers led single-seat F–105Ds above the weather. F–105s flew in formations of four, eight, or twelve aircraft alongside a B–66 at altitudes usually above 15,000 feet. Also called synchronous radar bombing and buddy bombing, this method required the EB–66 navigator to use his K-5 radar bombing navigation system to detect the target and send a signal tone to the F–105s to drop their bombs.

On December 24, 1965, President Lyndon B. Johnson imposed a 36-day halt to the Rolling Thunder bombing of North Vietnam. Despite this restriction, the 355th TFW, based at Takhli, Thailand since November 3, 1965, began flying these pathfinder missions on January 1, 1966. This technique was their primary means of contending with the 1965–1966 northeast monsoons that frequently obscured their targets across North Vietnam. The 355th wing history for the period described this radar bombing technique.

So that weather would not be a factor in the lack of missions into North Vietnam, a new technique was developed using the buddy system radar type bombing, with a B–66B Destroyer aircraft. The Destroyer would guide a flight of four F–105 aircraft into a target. At a certain predestined point and signal on the Destroyer radar, the navigator would give the signal to the flight to make their weapon release. The wing flew practice missions in the southern Pan Handle of North Vietnam to test the feasibility and accuracy of this method of delivery. These test flights proved that the technique was practical and could be used effectively against certain targets.

Wing pilots also flew practice missions against targets in Laos.

On December 8, 1965, the 333d TFS from Seymour Johnson AFB, North Carolina, arrived at Takhli with its 25 experienced F–105 pilots to become the second of the three squadrons to form the 355th TFW. Capt. Robert D. Gobble, one of the 333d pilots who flew these early pathfinder missions, recalled, “The B–66 would alert us by radio that the tone would start in say 10 seconds and, as briefed prior to flight, when the tone stopped, the Thud’s would release their bombs. The tone was over the UHF radio on the B–66 frequency [also] briefed prior to flight. If any one of the 105’s radio was out, then they were briefed to drop when the flight lead dropped.”

After their experiments in January, the 355th began using B–66 pathfinder bombing. On February 1, 1966, EB–66 pilot Capt. Jerry S. Grimes from the 41 TRS at Takhli led twenty of the 355th’s F–105s on the first official pathfinder-bombing raid over North Vietnam. Their target was a port facility near Vinh in the southern panhandle of North Vietnam. “On the initial run-in, they had two flights of F–105s with them. Upon completion of the first drop, they returned to the IP [Initial Point] and guided three more flights to the target. Not one

Pathfinders

During the Vietnam War the Air Force employed radar systems, the primary technology then available, for their fighter-bombers to bomb at night and in bad weather. They tried two general methods for using radar, some based on a planes’ internal radar that displayed a target’s return on the cockpit radarscope, while other methods employed external ground radar that guided planes over targets.

IN JANUARY, THE 355TH BEGAN USING B–66 PATHFINDER BOMBING

pylons. The Mach 2 F–105D had a much simpler bombing system than the Navy’s A–6A. Republic’s “Thunderstick-Fire-Control” system included the ASG-19 ground-mapping radar, the APN-131 Doppler navigator, and analog toss-bomb and air-data computers. The ground-mapping radar had a terrain avoidance mode and a means for setting terrain avoidance distances to help the pilot deliver a nuclear weapon at night and in bad weather.

During their training, F–105 pilots needed to achieve certain bombing accuracy scores to be qualified to sit on nuclear alert. For example, between October and December 1961, F–105 pilots in the 53d TFS from the 36th TFW at Bitburg AB, Germany, trained in their new Thunderchiefs by dropping practice bombs on the desert weapons range in Libya. When the 53d pilots used the system’s two radar delivery modes, called Blind Target Identification Point (BTIP) and Blind Laydown (BLD), they achieved circular error averages (CEAs) respectively of 1,313 feet and 884 feet. These CEAs were essentially the best scores the system could produce since they were achieved under ideal weather conditions and with no enemy defenses with which to contend. Considering the large blast radius of a nuclear weapon, these average distances from an aiming point were sufficient to ensure the destruction of a target. However, four years later, when the Air Force used these F–105 radar delivery modes with conventional bombs dropped from hostile skies over North Vietnam, the CEAs were usually worse and their 750-pound and 3,000-pound bombs seldom damaged their intended target.

An A–6A in February 1966 from VA–75—the Sunday Punchers—from the USS Independence, the first unit to employ the Navy’s new all-weather attack jet in Vietnam. VA–75 flew their first A–6A combat mission on July 1, 1965. (Navy photo from the Emil Buehler Library, National Museum of Naval Aviation, via Dave Powers.)
round of flak was observed during the entire mission." The 20 F–105s dropped 60 bombs on the target.12

An Air Force report, ignoring the January practice missions, officially acknowledged those flown in February.

The resumption of air strikes in February saw the introduction of another method of synchronous bombing to increase all-weather capabilities. The B–66 pathfinder aircraft, using synchronous radar bombing procedures, led the fighters on their bomb runs... A total of 82 radar strikes were flown in February, dropping approximately 95 percent of all bombs delivered on North Vietnam by the Air Force during the month.13

Some F–105 pilots derisively began calling them “12 O’clock High” missions, reminiscent of the World War II B–17 formation bombing raids over Germany depicted in the Gregory Peck film of the same name. They were hardly the roving missions that fighter pilots like to do.14

F–105 Radar Bombing Experiments

Early in February 1966, the 355th TFW experimented with using the F–105’s own radar and bombing computer as a means of hitting targets through bad weather. As reported in the wing history, the 333d TFS launched several flights “... against coastal North Vietnam targets using radar toss bombing techniques. The results of these trials were inconclusive and this technique was discontinued.”15 Bob Gobble flew one of these “inconclusive” missions, his 42d, on February 11, 1966, as the lead of “Healey” flight.

I was #3 and lead aborted so I took lead on a TBC [toss bomb computer] drop on the coast of [North Vietnam]. It was a flight of three as #2 aborted also.

Gobble described how this F–105 bombing technique should have worked. “The Thud system allowed you to fly straight ahead level until you got in range to loft the bombs by pulling up or you could remain level and the bombs would come off at the right time since the pickle button was held down all the time from target designation. Wingmen dropped manual when lead’s bombs came off.” 17 This radar bombing technique, tried and abandoned in February 1966, would become a major program in the spring of 1967.

Continued PathfinderBombing

Bad weather over North Vietnam during March 1966, forced the continued use of pathfinder bombing.

This technique continued to be the mainstay of USAF efforts in North Vietnam during March. Bad weather, limiting visual strikes in many areas, placed heavy requirements on the all-weather capability of the radar pathfinder aircraft. During the month, 80 percent of all bombing operations in North Vietnam utilized this technique.18

On April 1, 1966, under Rolling Thunder 50, President Johnson authorized more targets for attack in North Vietnam. At the same time, the Air Force and Navy agreed to change the seven “route packages” in North Vietnam from a weekly “time share” basis between the two services into permanent assignments of each service to specific route packages. The Air Force got Route Packages 1, 5, and 6A while the Navy took on Packages 2, 3, 4, and 6B. The Marines flying from Da Nang AB, South Vietnam, shared targets in Route Package 1 with the Air Force.19 However, weather continued to hinder Air Force planes from attacking many of the newly authorized targets and F–105s still depended on pathfinder missions into the southern areas of North Vietnam. It was too dangerous for unarmed EB–66s to escort bombing missions to the major new targets further north.

On April 8th the Air Force organized the 388th TFW at Korat, Thailand, to take over the base’s temporary-duty F–105s that had been flying combat missions since August 1964. Its initial F–105 squadrons were the 421st TFS and the 469th TFS. Throughout the summer of 1966, F–105s from both Takhli and Korat continued flying pathfinder missions whenever weather prevented visual bombing of their targets in North Vietnam and Laos. On June 16, 1966, Bob Gobble flew one for his 100th and final combat mission over the North. He flew as his flight’s #2 in F–105D 61-0116.

We dropped off the B–66 on the ferry slip just south of the Mudhole and the hits weren’t too good. The
In early 1966, these EB–66 pathfinder missions were the only way for the Air Force to bomb targets in North Vietnam when cloud cover obscured the ground below. However, pathfinder missions were limited to the southern area of North Vietnam where air defenses were relatively light. As the Rolling Thunder campaign added targets further north, the Air Force lacked the ability during monsoon weather to strike these more significant and heavily defended targets.

**Sky Spot Beacon Bombing**

Starting in April 1966, the Air Force began opening MSQ-77 ground radar stations in South Vietnam and Thailand that offered a second method of radar bombing called “Combat Sky Spot.” The technique applied radar bomb scoring methods used by the Strategic Air Command (SAC). The Sky Spot radars eliminated the need for pathfinder aircraft. Sky Spot radar operators talked pilots over the target and told them when to drop their bombs. These ground radar stations provided a night and all-weather bombing capability in southern Laos (a region the military called “Steel Tiger”), throughout South Vietnam, and in Route Package 1 of North Vietnam. The Air Force flew 56 Sky Spot strikes in Route Pack 1 within the first month of its use.²²

A year later, in a program called “Project Combat Proof,” the Air Force began adding a Motorola SST-181X Radar Beacon Transponder to their aircraft that enhanced the ground radars’ ability to see the aircraft they were guiding. Without the aircraft transponders, MSQ-77 radar stations could “skin paint” aircraft at a distance of 40 to 50 nautical miles. With the beacon, the ground radars could track their aircraft up to 196 nautical miles away, allowing them to control bombing as far north as Route Pack 3 in North Vietnam.²³

Like the pathfinder missions, even with aircraft beacons, Sky Spot radar bombing techniques were limited to targets in South Vietnam and the southern regions of North Vietnam and Laos. As the distance from the Sky Spot radar transmitters increased, bombing became less accurate. To be effective in bombing in weather and at night, the Air Force still needed a means of reaching the major targets in the upper regions of North Vietnam.

**The Monsoons Return**

In December 1966, the Rolling Thunder campaign was in phase 52 that began on November 12, 1966. By December, monsoon weather was again thwarting the Air Force’s bombing efforts against North Vietnam. Among the major Joint Chiefs of Staff (JCS) targets approved for strikes during Rolling Thunder 52, were the Yen Vien rail yard (JCS 19), the Van Dien truck depot (JCS 63.11), and the Ha Gia POL storage area (JCS 51.10), all in the Air Force’s territory, Route Pack 6A near Hanoi. However, on December 15, the President withdrew authority to strike the Yen Vien yard and the Van Dien depot before the Air Force could attack these targets. After this deferment, the Air Force scheduled their primary strikes against the Ha Gia POL area with a secondary objective of bombing all other POL targets around Hanoi.²⁴ On December 22, 1966, Headquarters Pacific Air Force (PACAF) presented their biweekly briefing to the Commander In Chief, Pacific Command (CINCPAC), Admiral Ulysses S. Grant Sharp. The briefing reported poor results for the USAF Rolling Thunder bombing for December 5 through 18, 1966.

Weather was the dominant factor in our operations over the entire area [of North Vietnam]. In Route Packages 2 thru 6, our over-all diversions and cancellations, because of weather, amounted to 83% of the effort scheduled. ... A heavy effort was scheduled against these targets [approved for Rolling Thunder 52], but that nearly all of this effort was diverted because of weather to other areas ... Ninety-four percent of the 1,310 sorties scheduled [for Route Package 6] were cancelled or diverted because of bad weather.²⁵

Due to continued bad weather over North Vietnam, the Air Force’s bombing results were equally bad for the last weeks of 1966 and into January 1967. The
During this 19-day period, the briefing reported, Air Force planes flew only 88 sorties against 34 targets in RP 2, 17 sorties against 10 targets in RP 3, and six sorties in RP 4. They had only 2 days of clear weather to enable strikes against the Northwest Rail line in RP 5, where they flew 18 sorties against 7 targets that included 3 bridges, 2 rail yards, 1 rail siding, and 1 rail segment.26 Three weeks later, these meager bombing results got the attention of the new CINCPACAF, Gen. John D. Ryan.

General Ryan Takes Charge

On February 1, 1967, General Ryan replaced the retiring Gen. Hunter Harris as PACAF Commander at Hickam AFB, Hawaii. General Ryan had commanded SAC where B–52 crews routinely practiced long-distance navigation and simulated dropping nuclear weapons on strategic targets using their system radar.27

By the end of February, General Ryan, prohibited by political constraints from using B–52s for bombing North Vietnam, recognized that he needed fighter-bomber aircraft with an all-weather radar capability comparable to the Navy’s A–6A. He directed his operations staff to come up with a solution to the problem and at the same time asked his boss, the Chief of Staff of the Air Force, Gen. John P. McConnell, for data on the radar bombing capability of USAF aircraft.28

In response, on March 24, 1967, the Air Staff chartered the All Weather Bomb Task Force, nicknamed “Combat Target.” The Combat Target charter letter justified the fast-paced program by stating, “The assigned SEA tactical forces are technically incapable of bringing appropriate targets in North Vietnam under successful attack during periods of bad weather/low visibility.” The stated purpose of the task force was to “examine current, off-the-shelf equipments, both aircraft and avionics, to identify developments and modifications to these equipments and current tactics so as to provide an effective all-weather attack capability in Southeast Asia as soon as possible.” As part of Combat Target, General McConnell also initiated “Combat Bullseye” flight tests to determine “the real capability of the F–105 radar bombing system.”29

Combat Bullseye Testing

Combat Bullseye went beyond testing the F–105. The program was a series of tests on a variety of Air Force aircraft that included a detailed analysis of the radar-bombing accuracy of each plane and the cost effectiveness of using the plane under varying conditions for the war against North Vietnam. The test program was remarkable for its scope and the speed with which it was accomplished. The tests involved the two-seat F–105F (some in standard configuration and others with two different modifications to improve radar bombing), the single-seat F–105D, the F–4D, RF–4C (radar evaluation only), the F–111A, and the B–58. The flight tests started on March 23, 1967, and concluded on June 9.30

Combat Bullseye flight testing was done in four phases and nine parts. The first phase determined the radar bomb drop CEP of the fighter-bombers. The second phase determined the effectiveness of these aircraft against area targets. Phase 3 evaluated the B–58 as a pathfinder leading formations of fighters to the bomb release point. The last phase (“Bullseye II - Phase 2”) evaluated the B–58 for dropping conventional bombs using its own radar.31 B–58 tests were flown from Eglin and Nellis.32

Military and civilian researchers performed detailed statistical analyses of the results of bomb drops from the test flights and added economic factors that included the expected improved CEP; expected aircraft attrition in SEA; and modification, deployment, and support costs.33

The Air Staff published the final Combat Target Task Force Report in October 1967 by which time the Air Force was already implementing many of its recommendations. A fundamental conclusion of the task force was “To achieve target destruction without excessive expenditure of sorties and munitions, non-nuclear weapon systems must produce combat CEPs of 200’ or less. Equipment currently in use or programmed for all-weather bombing capability will not produce this CEP.” 34

Nevertheless, the Air Staff task force recommended for “improved effectiveness” the deployment of F–4Ds (already done), the deployment of modified F–105Fs “optimized by Republic for radar level bombing,” the installation of a Skyspot MSQ-77 radar in Laos, the deployment of six F–111As in January 1968, and the deployment of F–105s “modified under the T-Stick II/LORAN program” in late 1968. The Air Staff also recommended exploiting all-weather weapon systems in Southeast Asia “through peaking of weapon system components, training programs, and crew/staff specialization.”35

Weather Delays a Major Strike

On February 22, 1967, President Johnson
approved the next phase of the bombing campaign, Rolling Thunder 54, in which he allowed attacks on more significant industrial targets than previously. One of these targets was the Thai Nguyen iron and steel plant (JCS target 76.00) in Route Pack 6A in North Vietnam.37 This factory was the largest industrial facility in North Vietnam located 35 miles north of Hanoi. Its destruction, the military believed, would significantly degrade Hanoi’s ability to produce materials to wage war in South Vietnam.

The Thai Nguyen Iron and Steel Combine ... was the first large plant of its kind built in NVN. According to official estimates by the NVN government, the complex would satisfy 20 percent of the country’s iron and steel requirements when it was in full production. Important products produced at this plant in early 1967 included steel barges, POL tanks, and bridge trusses.38

Both wings of F–105s at Takhli and Korat scheduled missions against the plant twice a day since it became an approved target but were weathered out each time. “The month of February produced fewer sorties than any of the previous nine months. ... The bad weather continued for most of the month of March.”39

Finally, on March 10, 1967, the weather cleared and seventy-eight F–105s from Korat and Takhli and twenty-two F–4Cs from Ubon bombed the Thai Nguyen Iron and Steel plant then did it again the next day.40 The 17-day delay in attacking this critical target gave further emphasis to developing ways to bomb in bad weather.

The first ten students were F–105 instructor pilots – six from the 41 Air Division (2 of whom did not deploy) and four others from the 18 TFW at Kadena AB, Okinawa. “These pilots completed the training on 17 March in time to serve as the front seat pilots for eight F–105 replacement strike pilots that had been diverted from their assignments to Korat and Takhli in Thailand.” 41

In their haste to get the program going, the Air Force selected pilots to fly in both seats of the F–105F. They had no time to recruit and train radar bombardier-navigators, the type of men in the right seat of the Navy’s A–6A and in SAC’s B–52s and B–58s. All F–105 pilots learned to operate the radar for navigation and nuclear bombing and these men were available and heading for Southeast Asia from the F–105 Replacement Training Unit (RTU) at McConnell AFB, Kansas. Putting an F–105 pilot in the back seat got the program up and running but created a morale problem for these dual-pilot crews. Most of the rear seat pilots, pressed into duty as radar navigators, did not sign up for this job and resented not being able to fly the plane.

The Air Force initially called the program “Project Northscope,” then “Operation Commando Probe,” and finally “Commando Nail.” Initial crews, however, derisively referred to the program as “Ryan’s Raiders” and designed a patch showing a large gold screw piercing the rear cockpit of an F–105F.42

Capt. Lawrence E. Huggins and Capt. Paul W. Hansen from Yokota’s 35 TFS were two of the instructor pilots (IPs) picked to train the initial Ryan’s Raider crews at Yokota. Larry Huggins recalled, “PACAF directed the program to be started at Yokota, [which] made sense since the other [PACAF F–105] unit was at Kadena and could not fly local TA/CM sorties of any length [Terrain Avoidance/Contour Mapping modes of the F–105 radar].” Two other Yokota instructor pilots, Capt. Nicholas J. Donelson and Capt. Peter P. Pitman, were also from the 35th TFS, while two others, Capt. Donald L. Heiliger and Capt. David Burney, were from the 80th TFS. The four instructor pilots from Kadena were 1st Lt. Donald D. Henry from the 67th TFS and three pilots from the 12th TFS—1st Lt. William W. Koelm, Capt. John F. Rehm, and Capt. George A. Bogert. As Larry Huggins explained, “We were all IPs and were the
guy’s with the best radar bomb scores. Our primary mission at the time was SIOP [Single Integrated Operational Plan, the United States’ comprehensive nuclear retaliatory plan].”43 “After a ten-hour refresher course on the R-14A radar, the toss bomb computer (TBC), and radar interpretation techniques, the crews were given twelve flights within a short twenty hours flying time.” 44

Under Project Northscope, technicians of the 441st Armament and Electronics (A&E) Maintenance Squadron at Yokota modified four of Yokota’s F–105Fs to increase the sharpness of the planes’ radar display. The modification was to improve system accuracy to 750’ CEP [Circular Error Probable] on radar reflective targets.”45 The first four aircraft that received the radar modifications were already equipped with the ER-142 and APR 25/26 Radar Homing and Warning equipment for the Wild Weasel III mission and so became dual-capable for Ryan’s Raider night missions as well as day or night SAM-suppression missions. The Yokota radar modification involved two changes to the system that gave better target definition:

1) A faster sweep sector scan that allowed the pilot in the rear cockpit to receive a target return on his radarscope three times as fast. The faster sweep resulted in the target image remaining longer on the scope, which allowed more accurate target tracking. The modification also provided the capability to position the radar antenna to any position within its normal 90-degree sweep pattern by use of the clearance calibrate control on the right hand control panel.

2) An expanded scope mode that allowed the pilot in the rear cockpit to expand his target returns on the radarscope to two times their normal size and provided horizontal and vertical control of his display while in the expanded mode.

The modification also installed a pushbutton switch in the rear cockpit to enable the pilot in the back to drop bombs without touching the control stick, the location of the regular ‘pickle’ button.”46 Larry Huggins explained how the instructor pilots trained with the modified systems. “We flew them using the TA/CM mods through the local mountains ending up on our bombing target in Tokyo Bay (R-112).” 47

Maj. Ben M. Pollard was the senior officer in the first group of Ryan’s Raider back-seat pilots. He had taught aeronautics at the Air Force Academy and had completed F–105 pilot training at McConnell AFB on February 13, 1967 in RTU Class 67FR. After attending jungle survival school at Clark AB in the Philippines, he was ordered to report to Yokota for further training instead of Korat for combat. In 1992, he recounted his Ryan’s Raider experiences in an oral history interview conducted by the Air Force Academy.

In the first briefing [I] was told, ‘The Navy is over North Vietnam in the deep packages … at night with

the A–6, and the Air Force had no airplane that could do it. Politically, the Air Force was looking bad, and therefore, three-fingered Jack Ryan … said that he wanted us to do the job. He had looked into the B–58s and said we couldn’t afford to lose a B–58; we couldn’t afford to lose a B–52, and so we were going to have the F–105 do it at night against Package V and VI, single-ship, night, low-level, terrain-avoidance bombing ... We started practicing these missions all over Japan … We couldn’t hit the broad side of a barn; the terrain avoidance wouldn’t work, we weren’t trained for this; nobody, even in the States, would … fly this mission … and we were going to go over and check it out the first time in combat!”48

The first training class consisted of five crews who initially operated as a provisional squadron under Maj Pollard as the senior officer. Major Pollard continued,

We flew down to Kadena, Okinawa, to check out on bombing accuracy. I was flying with [Instructor Pilot] Don Heiliger … We got there, and they wanted us to immediately go out on this bombing range and check the accuracy of this new radar. … We got a briefing, and we took off ... in a four-ship ... two from Ryan’s Raiders and two from Okinawa to lead us around the range and area. … We dropped about three bombs, and then the weather just went to nothing. … Lightning, pouring down rain. … We floundered around, broke up into singles and finally got on the ground. … We flew three missions the next day. We were doing a little bit better. We were dropping 700-foot bombs. We had more ... right to left accuracy than with the normal bombing system, but we were still having all of our worst fears in terms of the terrain avoidance system. Then we flew back to Yokota and continued our training.49 The initial reliability of the radars was so poor on the heretofore unused systems that very little actual low level radar navigation or bombing was accomplished. … However, the first four crews were certified to have achieved sufficient radar bombing proficiency to deploy, on schedule, in late April.50

F–105D Radar Bombing Strikes

General Ryan didn’t wait for his Raider crews and aircraft to finish their preparations at Yokota to start other F–105 radar bombing programs. On March 13, 1967, two days after the Thai Nguyen steel mill strike and 11 days after the Ryan’s Raider program kicked off at Yokota, the PACAF Commander visited the 355 TFW at Takhli with an inspection team from 13th Air Force. Maj. Kenneth H. Bell, the 355th Standardization and Evaluation Officer, briefed General Ryan on techniques the wing had been studying for dropping bombs using the F–105D’s R-14 radar and Toss Bomb Computer. Maj. Bell and three other F–105 pilots (Capt Harry E. “Hank” Higgins from the 357 TFS, and Maj. Frederick Gregory “Ted” Tolman, and Maj. Randall L. “Randy” Plumb, both from the 354 TFS), had been developing and testing the concept for the
past two weeks when the weather had prevented the wing from attacking the Thai Nguyen steel mill. To give the Air Force a capability the Navy had with the A–6 Intruder, General Ryan, “... wanted a better answer, faster. Right on the spot, he formed a Tactics Working Group”. He appointed Maj. Bell as lead and demanded a report in one week. The group began work immediately and decided to plan and fly a mission using the techniques that they were developing. They picked Sunday, March 19, 1967, for their trial mission.  

A group from the 388th TFW at Korat also began working on a similar F–105 radar-bombing mission for the same date. On March 19, each wing flew a morning practice mission for their real missions in the afternoon against two major power plants in North Vietnam. The 355th TFW was to bomb the Viet Tri power plant (JCS 82.17), 27 nautical miles northwest of Hanoi on the Red River while the 388 TFW was to attack the Thai Nguyen thermal power plant (JCS 82.16), 35 nautical miles north of Hanoi.  

During the morning practice in cloudy weather, F–105D 61-0123 from Korat crashed against a hilltop in the lower region of North Vietnam about 3 nautical miles west of the border with Laos killing the pilot, Lt. Col. Joseph Clair Austin, the commander of the 34 TFS. Lt. Col. Austin had had about six month’s experience flying F–105s and had been Korat’s mission commander and a flight lead on the Thai Nguyen steel mill strike on March 10, the same day he had become commander of the 34 TFS.  

During the Sunday afternoon missions, each wing used a flight of three F–105s to bomb their power plant targets. The 355 TFW, targeted against the Viet Tri plant, used the same flight lineup that they used in their morning practice mission against a road junction in RP 1 – Lt. Col. Danny Salmon, flight lead; Maj. Randy Plumb, number 2; and Maj. Bell number 3; with Ted Tolman as the airborne spare dropping out after refueling on the tanker.  

Salmon’s flight executed the mission as planned, avoiding light flak and flying on radar through heavy weather before popping out and spotting the target. Their bombs were not as accurate as they had hoped.  

Our worst problem was the location of the sand bar that we had selected as our timing point. It had shifted enough to throw our timing off and cause our bombs to hit slightly short of the target. We did do some damage to the buildings surrounding the power plant complex, but the results were disappointing compared to the effort we had put into the mission and the extraordinary risks we had taken.  

Maj. John M. Rowan from the 469 TFS led the three F–105s from Korat in their afternoon radar-bombing mission against the Thai Nguyen thermal power plant. Korat’s three pilots attacking the plant dropped nine 500-pound bombs. They couldn’t give an accurate BDA due to having to evade flak but analysis of strike photos from two of the planes (the film from the third plane was not useable) identified impacts of five of their nine bombs.  

That night, film from a reconnaissance plane revealed the Thai Nguyen power plant, Korat’s target, was still operational. RF–4C pilot Capt. Byron Marvin and his backseater, 1st Lt. Ronald W. Sager, flew the reconnaissance mission. “The infrared film showed a ‘bright spot’ that indicated the power plant was back in operation.”  

Four days later, on March 23, and again on March 24, 1967, Navy A–6s, using their radar, dropped fifty-three 1,000-pound bombs on the power plant at Thai Nguyen. CINCPAC, Admiral Ulysses Grant Sharp, asked his staff to prepare a comparison of the radar bombing between the F–105s and the A–6s against the same target. BDA photography from March 29 allowed photo analysts to identify 21 of the Navy bombs in addition to the 5 bombs dropped by the F–105s on March 19. However, analysts couldn’t identify 10 of the bomb impacts and 26 impacts couldn’t be seen in the photos. The PACAF briefing to Admiral Sharp for the period March 20 to April 2 addressed the Admiral’s question on the relative success of Korat’s F–105D radar strikes and the Navy’s A–6 radar strikes but avoided making a direct comparison of bombing accuracy between the two types of planes.  

As a result of the combined AF/Navy strikes, the boiler house received severe damage from a direct hit. It was not possible to ascertain whether this was an Air Force or Navy bomb. The important point remains that this plant is no longer operational. It is estimated that 15 to 18 months will be required to repair this damage.  

Six months after his radar-bombing mission, Major Rowan received the Air Force Cross for leading the mission from Korat against the Thai Nguyen power plant. Gen. Gabriel P. Disosway, commander of the Tactical Air Command, presented the award. The citation read  

... Maj. Rowan made Air Force history by successfully leading a flight of three F–105 Thunderchiefs on an unprecedented and daring low-level, high-speed attack on a vital thermal power plant, deep in North Vietnam. This tactic of weapons delivery was an original concept formulated and submitted by Major Rowan to higher headquarters. Despite extremely hazardous flying conditions consisting of extremely low clouds and poor visibility, and an intense barrage of antiaircraft artillery fire over the target, and a near miss by an SA-2 surface-to-air missile, Major Rowan heroically led his flight through rugged mountainous terrain to accomplish this highly significant mission...  

Ryan’s Raiders Go to War  

On April 13, 1967, the 388th TFW at Korat sent four of their Wild Weasel III F–105Fs to
Yokota AB, Japan, for the “Yokota Mod” to improve their radar display for Ryan’s Raider missions. These planes joined the four already modified at Yokota and returned to Korat with the second set of trained crews. On April 22, the first Ryan’s Raiders crews who were training at Yokota were alerted for deployment to Korat. Ben Pollard recalled, “... in late April, we got the word that we were going south. ... We were going to go to war and there was no warning.” The first four crews deployed to Korat arriving on April 24, 1967. They were assigned to the 34th TFS under the command of Lt. Col. Alan G. Nelson. The front and back seat pilots were:

- Capt. Donald Heiliger with Maj. Ben Pollard,
- Capt. Nicholas J. Donelson with Capt. David W. Forgan,
- Capt. Peter P. Pitman with Capt. Robert A. Stewart,
- Capt. Dave Burney with Capt. Aquilla F. Britt.

These men were highly capable and experienced pilots. For example, Capt. Don Heiliger had flown combat in 1966 on temporary duty with the 333d TFS at Takhli. Pete Pitman, raised in Atlanta, Georgia, was a 1960 graduate of Georgia Tech with a degree in industrial management and had flown two 30-day combat periods with the 354th TFS at Takhli in 1966, where he had evaded two MiG-17s during a mission on August 12. His backseater, Capt. Bob Stewart, had graduated first in his class of 479 cadets at West Point in June 1956 and had chosen the Air Force as his career. After flying F–102s, he taught Mechanical Engineering at the Air Force Academy. The other rear seaters, all experienced pilots, were recent graduates from McConnell’s F–105 Replacement Training Unit (RTU).

On April 26, 1967, Rolling Thunder Phase 55 gave the Air Force five new targets outside Hanoi. Wasting no time, the Ryan’s Raiders were committed to some of these targets. Shortly after he arrived at Korat, Maj. Pollard, the group’s senior officer, learned of their first mission from the 388 TFW commander, Col. William S. Chairsell. He ... said, “You’ve got a target. Your first target is 10 o’clock on Wednesday night, Package V at Yen Bai, and you are going to go down the Red River.” ... I said, “Okay, if anybody is going to go first, it’s going to be me,” so we started briefing that night. We were briefed that night and all day, all afternoon, all night on Tuesday. We got up the next morning and did our flight planning. ... We got the SAR [Search and Rescue] ... briefing. In every one of our missions, the briefing was, “There is none.” If you fly at night over North Vietnam in deep Package V and VI, there is no search and rescue. ... Our SAR briefings were really, really short.

On the night of April 26, Maj. Pollard in the rear seat flew with Capt Don Heiliger to strike the Yen Bai railroad yards on the northwest rail line about seventy-five miles northwest of Hanoi. The target for a second Ryan’s Raider crew was the Ron ferry in Route Pack 1.

That night we took off [at] 8 o’clock or so and climbed out and hit the tanker, and we went up the Red River ... and ... hit Yen Bai ... at 10 o’clock ... 50-some hours after we landed at Korat. The other airplane went out about two or three hours later and hit a target in Package I.

After these first missions, PACAF quickly added single-ship Ryan’s Raider night missions to the strikes against North Vietnam. The PACAF briefing to CINCPAC for the period of April 24 to May 7, 1967, reported, “This period saw the introduction of F–105F radar drop missions in RP-6A. The Thai Nguyen railroad yard [JCS 21.11], Kep railroad yard, Vu Chua railroad yard, and the Thai Nguyen I and S complex [JCS 76] were all struck utilizing radar delivery.” These Ryan’s Raider night strikes and daytime strikes by other aircraft halted through traffic on the northwest rail line between four and eight days during this 14-day period.

The day after their first Ryan’s Raiders night missions, the 388th TFW received a message that Hanoi had 29 air raid warnings “... and that people were running around in panic.” The wing history for the period asserted,

*With the advent of the Ryan’s Raiders, a historically significant fact in the annals of the United States Air Force occurred. It was the first time that tactical jet aircraft were used in combat against an enemy on a 24-hour basis.*

However, an Air Force historian was less sanguine.

*The tracks provided a good radar return, but darkness inhibited bomb damage assessment, as did craters left by earlier bombing. Impressive results were not produced by these raids or those that followed against Thai Nguyen and other targets in the delta.*

On May 4, 1967, the second set of dual-pilot
Ryan's Raider Changes

Throughout April and May 1967, the 388th TFW began improving the Ryan's Raider planes that Yokota had modified. To make the planes less visible at night, maintenance sprayed tan and light green paint to the bottoms of the fuselage and wings to replace the original light grey. The 388th also began formulating improvements to the Yokota modification that included replacing the radar's direct-view storage tube with a cathode-ray tube to improve scope resolution and installing a radar altimeter to give direct readings of distance above the ground. The wing requested that Hq PACAF approve modifying eight of their F-105Fs with these improvements.

The most significant change begun during this period was the aircrew composition – replacing dual-pilot crews with Wild Weasel crews and Electronic Warfare Officers (EWOs) in the rear cockpit. Lt. Col. James E. McInerney, Jr. from the 13 TFS, the Wild Weasel squadron at Korat, initiated the change. He had flown F-105s and F-4Ds at the 36 TFW at Bitburg AB, Germany, and with his EWO, Capt. Fred W. Shannon, had graduated in early March 1967 from Wild Weasel Class 67WW III-8 at Nellis AFB, Nevada. They and four other crews from their class had picked up five newly modified Wild Weasel F-105Fs at the depot in Sacramento, California and had flown them to Korat, arriving on March 13, 1967. He became the Operations Officer of the 13 TFS, commanded by Lt. Col. Gerald F. “Jerry” Fitzgerald, and he and Capt. Shannon began flying Wild Weasel missions.

On May 4, 1967, the day the second set of four Ryan's Raider dual-pilot crews arrived at Korat, Lt. Col. McInerney went to Saigon to pitch his plan for changing the Ryan's Raider crew. After a month of flying Wild Weasel missions, he had developed the scheme for replacing the rear-seat Raider pilots with Wild Weasel EWOs and had won the backing of his wing commander, Col. William S. Chairsell, to brief his plan to the 7th Air Force commander, Lt. Gen. William W. Momyer.

Col. McInerney had developed the concept by teaching his EWO, Capt. Fred Shannon, to operate the F-105's radar.

While it was clear to me that the Weasel pilots could have done the mission by themselves, as they had for years in Europe and the Pacific, it was not clear how the Electronic Warfare Officers (EWOs) would fit into the scheme. In an effort to find out, I tested my own EWO, Fred Shannon, to the limits. After the final post-strike refueling coming back from an Iron Hand mission, I would turn the flight over to number three—the element leader—and go off on our own to put Fred through the drill of working the terrain avoidance and contour mapping modes of the R-14A radar. I was able to formulate a plan which would enable us to simultaneously apply the experience of the Wild Weasel crew to the enormity of the task at hand and solve the very low morale of the Raider crews.

Seventh Air Force approved the plan.

Perhaps it was helpful that I had served under General Momyer in the waning days of the Korean War when he commanded the 8th Tactical Fighter Wing. Also, instrumental to that favorable decision was the presence at the briefing of then Lt Col Garry Willard, Commander of the Weasel training program at Nellis AFB who assured one and all that the Weasel training program ... could be adjusted so that all graduating crews were fully capable of performing around the clock all-weather bombing missions upon arrival in theater.

The Air Force immediately began to alter personnel assignments to bring Wild Weasel crews into the Commando Nail program.

Ryan’s Raiders’ Lose Two

On the night of May 12, 1967, disaster struck the Ryan's Raiders when one of their crews failed to return from a mission. Capt. Peter Potter Pitman and Capt. Robert Allan Stewart, flying F-105F 63-8269 with call sign “Crow 1”, simply disappeared. Both men were declared Missing in Action (MIA). Ben Pollard recalled the loss.

About ... 10 days after we started flying, I lost my first airplane. They were attacking Ron Ferry [in RP-1, North Vietnam] and someone up that night ... saw a flash [in the] Ron Ferry area. We never knew for sure what happened. I think most people felt that their terrain avoidance failed them. Anyway, something happened; they probably flew into a mountain, or they could have been shot down. We just didn’t know.

Don Henry was one of the Ryan’s Raider pilots who had arrived at Korat on May 4.

On 12 May, 1967, I was on my 5th Raiders mission going to roughly the same area as Captains Pitman and Stewart. After they were lost, I flew a second time that night, right down their route and over their target, but we didn't see or hear anything. Don’t think we will ever know what happened.

Their first loss didn’t deter the Ryan’s Raiders
from sending more crews into North Vietnam. Starting at 6:00 a.m. the next day, Saturday, May 13, 1967, Korat launched sixty-six F–105 sorties against targets throughout North Vietnam and in southern Laos. They ended the day with four Ryan's Raider night missions into North Vietnam. Unfortunately, while there were no losses, three of these four night missions were ineffective.77

Two days later, on Tuesday, May 15, 1967, the Ryan's Raiders lost their second plane, a loss even more devastating than their first. The crew, flying F–105F 62-4429 with call sign “Kaiser”, was Don Heiliger and Ben Pollard, the Ryan's Raider leader.78 It was Pollard's 42d mission over North Vietnam.

Our target that night ... was the Kep railroad yards about 60 miles northeast of Hanoi on the Hanoi-China railroad line. ... There's a (restricted) buffer zone between China and Vietnam, and ... we received special permission to fly into that buffer zone because we wanted to coast in over the buffer zone and run right down the railroad valley so the SAMs couldn't get us.

We came down the valley and picked up the target. Everything was going fine, and about 15 seconds out, they caught us in search lights. We were running at 1,000 feet above the ground and chose to press on—dumb! We couldn't maneuver because we were dropping on the computer—we couldn't do any turns; we couldn't jink; we couldn't do anything. ... We pressed on, right in the search lights. ... The whole sky lit up. They hit us about three or four seconds before bomb release. We pressed on and got the bombs off. ... The aircraft was really hurt; the forward fire warning light was on; the aft fire warning light was on. We were losing hydraulic systems, including our flight control systems. You could see fire on the airplane. So we started climbing ... Our plan was to get out of the SAM ring and then turn east to the ocean, but the airplane ... was out of control. ... I bailed out first. My guess is we were transonic, somewhere about 600 knots and in the 15,000-foot altitude range.

Their plane crashed in China. Pollard, badly injured during his ejection, passed out from pain several times and was captured in the afternoon after trying to hide in a ravine. Heiliger was also caught and both men were driven over rough roads to Hanoi where they spent the next six years in North Vietnamese prisons.79 With the loss of their second aircraft only 19 days after their first mission, the Ryan's Raiders stopped flying in the Red River delta.80

F–4s Fly Commando Nail Missions

With the restriction on Ryan's Raiders, Commando Nail missions to the area around Hanoi fell to the F–4Cs of the 497th TFS at Ubon, a squadron known as the “Night Owls.” However, as an Air Force historian pointed out, their luck proved little better than that of Ryan's Raiders. On the evening of May 22, 1967, the Night Owls sent four F–4Cs to attack the Cao Nung and Kep rail yards in RP-6B. They penetrated at an altitude of 500 feet or less, and two of the aircraft were hit by antiaircraft fire near the railroad.81

By the end of May, F–4Ds with their more accurate bombing computers arrived at Ubon and began replacing F–4Cs on Commando Nail missions. These planes continued radar bombing in the Red River delta but flew multi-plane day strikes as well as single-ship night missions. An Air Staff study completed in May 1968 described these night missions:

Since [ECM] pod formation is accomplished visually, it cannot be employed under conditions of darkness. Therefore, night missions are flown singly or in flights of two, utilizing radar-trail formation. Night missions are limited to attacks against moderately defended targets. The F–4D weapons release computer restricts it to nearly straight and level flight during the final bombing run; pre-computed release parameters must be attained at or before bomb release. 82

However, bombing accuracy remained a problem. The Air Staff report included statistics showing F–4D bombs were less accurate than bombs dropped by the Ryan's Raiders F–105Fs. After pointing out that radarscope photography was the primary means of determining bombing accuracy, the report stated, “Photo assessment of 29 F–105F bomb drops ... in Route Package V indicated a CEA of 2,910 feet. F–4D missions flown against a similar target resulted in a CEA of approximately 3,075 feet.” 83

Korat Gets the Last Ryan’s Raider Dual-Pilot Crews

The last Ryan’s Raider class at Yokota finished their training on May 17, 1967. By May 22, eleven more pilots had arrived at Korat to join the rest of the Ryan’s Raiders in the 34 TFS. These pilots were the third set of crews and the last of the 37 pilots who formed the original dual-pilot crews in the Ryan’s Raider program.84 Don Henry, one of the front seat pilots from Kadena who had arrived at Korat on May 4, recalled that these crews “... traveled by various modes of transport (military cargo to Korat or commercial to Bangkok, etc.) and arrived on various days. ... During May and June, there were more backseaters than frontseaters and crew pairings were not always the way we flew each mission.” 85

Wild Weasel Crews Begin Commando Nail Training

After Yokota instructor pilots completed training these last Ryan’s Raider dual-pilot crews, they began training Wild Weasel crews who arrived from...
Nellis. These crews were the first of the pilot-EWO crews trained to fly Commando Nail missions, the arrangement that Lt. Col. Jim McInerney had proposed to Seventh Air Force on May 4. Since Yokota had the training program already established, they picked up this training for Wild Weasel crews until the school at Nellis could incorporate night radar bombing into their Wild Weasel curriculum. Between April and July 1967, five Wild Weasel crews trained at Yokota. These five crews had completed either Wild Weasel Class 67WW III-9 on April 12 or Class 67WW III-10 on May 8. Capt. Lawrence E. Huggins from the 35 TFS was one of the radar instructor pilots at Yokota. “Our first students arrived from Nellis Weasel School and were all EWOs. We taught them radar bombing and were their front seaters for about two weeks of training (8–10 flights). Then their front seaters arrived from Nellis, flew a couple of flights together as formed crews, and left for Korat. By late summer the training program ended at Yokota, and we went back to being F–105D drivers pulling nuclear alert.”

Meanwhile, back at Nellis, four crews in Wild Weasel Class 67WWIII-13 began their regular Wild Weasel training in the 4537th Fighter Weapons Squadron (FWS). This training did not yet incorporate Commando Nail bombing but two of the EWOs in this class supported the F–105F Combat Bulls-eye testing at Nellis. These test missions contributed to the comparisons of bombing accuracy by different crew composition that were included in the details of the Combat Target final report. The Nellis unit history declared somewhat misleadingly, “The successful completion of the test provided a basis for expansion of Wild Weasel combat operations in SEA.”

**Ryan’s Raiders Transfer to the 13th TFS**

On June 1, 1967, Lt. Col. Jim McInerney, who had been the 13th TFS Wild Weasel Operations Officer, became the squadron commander replacing Lt. Col. Jerry Fitzgerald who had completed 100 missions over North Vietnam. On this same date, the Ryan’s Raider crews in the 34th TFS transferred to the 13th TFS so Colonel McInerney could manage the transition of the Ryan’s Raider mission to his Wild Weasel crews. He appointed Maj. John Reddock as his operations officer and appointed three assistant operations officers, one for each of his squadron’s missions: Wild Weasel, Ryan’s Raider/Commando Nail, and F–105D strike. As squadron commander, he flew all three types of missions.

Capt. Don Henry was one of the Ryan’s Raider pilots who started flying Raider missions the first week in May.

*We saw...[a lot] of the Wing Commander, Colonel Chairsell, who seemed to always drop by the planning room in the middle of the night to talk to us and attend many of our briefings. He also spent hours — literally hours — talking to our crews.*

The 13th TFS history documented problems with Raider operations during this period that included a “... lack of experience in Raider operations and techniques, which necessitated exchange of information with the A–6 Intruder pilots of the Bonhomme Richard.” In June 1967, Ryan’s Raiders in the 13th TFS flew 94 Commando Nail sorties into North Vietnam. June was also the first month that F–4Ds from Ubon flew their first two Commando Nail missions.

**Wild Weasel Crews Fly Commando Nail Combat Missions**

During the third week in July, the first five Wild Weasel crews who had been training for Commando Nail at Yokota arrived at Korat and joined the 13th TFS. The crews were Capt. Monte O. Lillard and EWO Capt. Roger A. Hermeling, Maj. James Mirehouse and EWO Capt. Albert L. Michael, Maj. Lawrence L. Friedman and EWO Capt. Tracy P. Rumsey, Capt. Charles A. Horner and his EWO Capt. Dino M. Ragagli, and Maj. Morris L. McDaniel and EWO Capt. William A. Lillund.

When he got to Korat, EWO Al Michael noted a negative attitude toward the Commando Nail mission from the pilots who flew from the aft cockpit and from the two combat losses.

*It was immediately apparent that the squadron and the wing [were] not overly enthusiastic about the ‘Raider’ mission. Some of the dual pilot crews had been broken up and returned to day strike pilot duties. The aircraft assigned to night bombing missions were taken at the expense of “Wild Weasel” sorties needed to support B–52 escort missions in Route Package 1 of North Vietnam. The new crews got the general feeling that the unit did not expect the ‘Raiders’ to succeed and would die a natural death. I feel that this increased the determination of the pilot/EWO crews to do a better than average job.*

Based on the two Ryan’s Raider losses in May 1967, “Many individuals within the wing felt that the mission would be cancelled and the aircraft would be returned to the ‘Weasels.’” During the next month, as the pilot/EWO crews began flying missions, “... all but one of the dual pilot crews either returned to day strike duties or completed their tour.” These pilot-EWO crews “... began flying with three night missions on selected targets in the low risk area of RP 1.” Despite their training at Yokota, “This was the first time either of the crews had flown at night using the R–14A radar for low profile missions. This was also another first for the Air Force Historians. These missions were the first time an electronic warfare officer dropped a bomb in combat.”

**Korat Changes Wing Commanders**

On August 1, 1967, Brig. Gen. William...
Spalding Chairsell completed his one-year tour as commander of the 388th TFW and was assigned to Eglin AFB, Florida. He had commanded the wing since August 1966 and had been promoted to Brigadier General on May 1. In his End of Tour Report, dated July 8, 1967, he gave his observations from his year at Korat and highlighted the record of the 388th TFW during his tour. His report gave a snapshot of the Ryan’s Raider program. Since its inception, Commando Nail has ... undergone major changes and is now being employed primarily as a harassment instrument against North Vietnam during hours of darkness. Our efforts to assess its effectiveness in terms of “bombs on target” have been frustrated by a lack of high speed KA-71 film. ... Armed with the knowledge we are acquiring from Commando Nail we should be in position by early September to provide ... a 24 hour bombing capability, employing the large strike force Pathfinder tactic during daylight hours and the Commando Nail harassment tactic during hours of darkness.

General Chairsell’s replacement was 46-year old Col. Edward Burke Burdett, one of the most experienced jet fighter pilots in the Air Force. As a 24-year old captain in 1945, Burdett was a member of the 412th Fighter Group based at Santa Maria, California, that was equipped with the P–59A, the Army Air Forces’s first operational jet fighter. While based at March Field, California, the group converted from the P–59A to the P–80A. Between May 15 and 28, 1946, Captain Burdett was one of twenty-nine P–80A pilots (that also included Major Robin Olds) who flew in “Project Comet,” a cross-country publicity demonstration of the country’s newest jet fighters that flew from March Field to Washington, D.C. and back.

Before arriving at Korat, Col. Burdett had commanded the 48th TFW flying F–100s from Lakenheath AB, England. To upgrade to the F–105, he went through an abbreviated course in McConnell’s F–105 RTU. Normally, F–105 RTU training took five months and students received 90 flying hours in the F–105. Short-course “Category IV” pilots who had previously flown the F–105 needed only refresher training that usually consisted of 16 flights and 23 flying hours. However, since Colonel Burdett had never flown the F–105 but had only one month before reporting to Korat, he received 22 F–105 sorties and 36 flying hours — not a lot of training in an aircraft in which he would lead major missions over North Vietnam.

**More Ryan’s Raiders Changes**

In addition to a new wing commander at Korat, August 1967 also brought further changes to the Ryan’s Raider program. Many of the Ryan’s Raider pilots in the 13th TFS began to fly F–105D strike missions as Wild Weasel crews who had trained in radar bombing arrived. The name “Ryan’s Raiders” gradually fell out of use and the program assumed the official name “Commando Nail.”

One of the original Ryan’s Raider front-seat pilots, 1st Lt. Donald Henry, who had arrived at Korat on May 4, returned home to the 67th TFS at Kadena on August 1. During his temporary assignment, he had flown a total of 43 Ryan’s Raider night missions.

I was in the Raiders for the first five months and had to leave when the PCS backseaters transitioned to the ‘D’ models where they belonged. I was TDY from Kadena, had combat missions from a previous TDY at Takhli, and Korat had too many pilots. Eventually I returned to Korat as an F–105 Weasel the last year of the war. On August 2, a Ryan’s Raider crew flew an experimental mission where their F–105F with its enhanced radar served as a pathfinder reminiscent of the missions led by EB–66s in 1966. Maj. Kenneth D. Oliver and Maj. Francis P. Walsh led sixteen F–105s on a strike against the Phu Tho army barracks (JCS target 39.38) in Route Pack 5 in North Vietnam. The main strike force flew formation on the lead plane and dropped their bombs on a signal from the F–105F. The wing history described the mission this way.

The purpose of this flight was to determine the feasibility of maneuvering a large number of airplanes while maintaining ECM jamming mutual support and a defensive posture against any potential aggressors and to bring all the aircraft to a common
release point in order to hit the target. In this respect, the mission was extremely successful; however, incorrect range calibration of the radar equipment in the lead aircraft resulted in the bombs being long and to the north of the target area. All aircraft assigned to Raider missions have since been recalibrated and peaked to the maximum possible in order to preclude similar results in future operations. 100

On August 3, Capt. John H. Rehm became the first Ryan's Raider pilot to complete 100 missions that included those he had flown as a strike pilot. “He returned to his organization, the 12 TFS at Kadena AB, Okinawa. His flying partner, Capt. Calvin H. Markwood, was released immediately to the day strike force.” 101

Commando Nail F–105Fs Attack Northwest Railroad

Throughout August and September 1967, unexpectedly bad weather during what was supposed to be the dry season, hampered Air Force missions over North Vietnam. The PACAF Rolling Thunder briefing to CINCPAC for the period August 28 - September 17 described the weather’s effects.

During this 21-day reporting period, there was a total of 9 days when no Air Force sorties penetrated the northeast sector due to weather. From the 11th through the 14th, air operations in all of NVN were seriously hampered by the presence of a weather front, which affected most of SEA, as it moved repeatedly into and out of our area of operation. 102

With the bad weather once more hampering USAF bombing efforts, PACAF again pressed Korat’s Commando Nail aircraft into action, overriding previous restrictions that limited them to the lower regions of that country. During this period, Commando Nail crews attacked the Northwest rail line in North Vietnam’s Route Pack 5 above Yen Bai. On August 30, 1967, they struck a rail segment 29 nautical miles NW of Yen Bai. Due to darkness and the lack of IR film for their strike cameras, there was no bomb damage assessment (BDA). Conventional strikes against the nearby Ky Dong railroad spur on August 29 left the rail line still able to handle traffic, so on September 5, a Commando Nail aircraft hit it again but did not inflict much more damage. On September 8, a Commando Nail F–105F struck the Cham Phuong railroad yard four nautical miles NW of Yen Bai. Again, there was no BDA. On September 15, a Commando Nail crew bombed the Dong Cuong rail yard 23 nautical miles NW of Yen Bai without BDA. 103

A Third F–105F Commando Nail Aircraft is Lost

During one of these night missions on September 7, 1967, an engine failure claimed a third Ryan's Raider aircraft. The commander of the 13th TFS, Lt. Col. Jim McInerney and his EWO Capt. Fred Shannon, flying F–105F 63-8260, were en route to the target when their engine blew up. ...The engine ... exploded when the high speed and low speed turbines got snarled up just as we were coming up on the tanker. A TCTO had not been complied with. I was told the boomer really messed up his drawers. [I] shut the engine down with fire lights and the TP [tailpipe] temp going thru the roof. Tried an air start but the temp was rising far faster than the RPM so I shut it down and we punched out.

Their plane crashed in northern Thailand. 104

McInerney was not injured but Shannon suffered a fractured thigh during his ejection and returned home to recover, ending his combat tour at 74 missions. The wing history reported the aftermath of the accident.

...A flamed-out F–105 crashed on privately owned property nearly 90 miles northeast of Korat. The wreckage was discovered and the legal claims team arrived at the scene. The claims of three property owners for total damages of 3,200 Baht ($160) were immediately accepted and this quick and amicable settlement was done with the assistance of the local district officer. ... Col. McInerney completed his remaining missions with various EWOs, including Capt. Calvin Miller, who flew 110 missions over North Vietnam—a new high for an EWO. 105

Commando Nail F–105Fs Transfer to the 44th TFS

Under PACAF Movement Order 35, dated September 20, 1967, the 13th TFS designation transferred from the 388th TFW to an F–4 squadron at Udorn. The departure of the 13th left the 388th TFW with the 34th TFS, 469th TFS, and 44th TFS, which had arrived at Korat from Kadena on April 25, 1967. The reduction from four to three squadrons was a result of combat losses of the F–105.

On October 6, 1967, under 388th Combat Support Group Special Order AB-3874, the 60 officers of the 13th were absorbed into the 44th TFS. The 44th distributed their twenty-one F–105Ds to the 34th and 469th and picked up the twenty F–105Fs and the Wild Weasel and Commando Nail missions from the 13th. The changeover was completed on October 18, 1967. The 388th TFW commander, Col. Edward B. Burdett, led the change-of-command ceremony during which Lt. Col. McInerney assumed command of the 13th, replacing Lt. Col. Fred A. “Fritz” Treyz as commander of the 44th. 106 The closeout history of the 13th TFS lamented the end of its F–105 operations at Korat. “May the new 13 TFS at Udorn continue the record established by this unit in the same manner as those who reluctantly passed the honor along.” 107 (Continued in the Summer 2006 issue.)
NOTES

6. TO F-105D-1, Flight Manual, 1 March 1964, pp 4-60, Fig 4-28.
7. 36 TFW history, 1 July - 31 December 1961, USAF microfilm MO627, frames 1009 and 1547. The CEA was the mean distance from each bomb's aiming point of all bombs dropped. In BTD, pilots navigated to the target using a prominent radar-reflecting object that was a known distance and direction from the target, a technique also called Offset Bombing. In BLD, pilots used a target's direct radar return as the aiming point.
9. 355 TFW history, Jan - Jun 66, USAF microfilm NO461, frames 1099 - 1100 and 1345.
10. The 469th TFS was the first squadron to arrive at Takhli on November 15, 1965. The third squadron was the 357th TFS that joined the wing on Jan 29, 1966.
12. 355 TFW history, Jan - Jun 66, USAF microfilm NO461, frame 1295.
15. 355 TFW history, USAF microfilm NO461, frame 1344.
17. Bob Gobble, e-mail to author, July 12, 2005.
23. Ibid.
30. Ibid.
31. Ibid, Annex N, pp 1, N-4 and N-5.
34. Combat Target Report, p 3.
36. In 1970, the Air Force modified thirty F–105Ds with the T-Stick II Loran bombing system but they were too late for use in SEA.
40. PACAF Rolling Thunder briefing to CINCPAC for the period 20 Feb - 19 Mar 1967. This two-day raid on the Thai Nguyen steel factory was a historic Air Force mission. It resulted in the award of the Medal of Honor to F–105F Wild Weasel pilot Capt Merlyn H. Dethlefsen, the shoot-down of two MiG-17s by F–105D pilot Capt Max C. Brestel, and the saving of an F–4C crew in an action that became known as “Pardo’s Push”. However, the USAF lost four F–105s and two F–4Cs. Four men became POWs and one was KIA. The plant, despite punishing attacks during these two days, remained operational. The USAF and Navy flew numerous bombing missions against the plant over the next several months. See Thompson, To Hanoi and Back, pp 57 – 58, 290.
44. Michael, Ryan’s Raiders Corona Harvest report, pp 4 - 5.
45. “A Report on Commando Nail, April 67 - March 68” by AFXOP, dated May 9, 1968, pp 1 - 2. CEP was the middle of bomb of all bombs dropped, excluding gross bombs. CEP differed from CEA, which was the average distance from the target of all bombs dropped. Both measures were used in citing bombing accuracy in SEA.
47. Larry Huggins, e-mail to author, Dec 15, 2004.
52. PACAF Rolling Thunder briefing to CINCPAC for the period 20 Feb - 20 Mar 1967.
53. Navy CNA Loss/Damage Database, USAF loss 547, microfiche frame 021. The crash was probably an accident but the record attributes the loss to “unknown gunfire (possibly combat associated).” Lt Col Austin graduated on November 21, 1966 from F–105 RTU class 67BRS, the second and last F–105 replacement training class conducted by the 4 TFW at Seymour Johnson AFB, NC. His name is on the Vietnam Wall panel 16E line 109.
54. 388 TFW history, Jan - Dec 67, USAF microfilm No 583, frame 1226. Lt Col Donald T. Bolling, 34 FS Commander, Hill AFB, UT, e-mail to author, Feb 26, 2002.
55. Bell, p 204.
56. Bell, p 206.
57. PACAF Rolling Thunder briefing to CINCPAC for the period 20 Mar - 2 Apr 1967.
58. Byron Marvin, e-mail to Ron Thurlow, Col USAF (Ret), Feb 6, 2000.
59. PACAF Rolling Thunder briefing to CINCPAC for the period 20 Mar - 2 Apr 1967.
62. Pollard interview, pg 18. Corona Harvest Chronology, pg 133. The four modified F–105Fs that the first Ryan’s Raider crews flew from Yokota were: 63-8269, 63-8312, 63-8345, and 63-8269.
63. 388 TFW history, Jan - Dec 67, USAF microfilm No 583, frames 1449 and 1582.
66. PACAF Rolling Thunder briefing to CINCPAC for the period 24 Apr - 7 May 1967.
67. 388 TFW history, Apr - Dec 67, Vol II, USAF microfilm No 584, frame 0036.
68. Thompson, To Hanoi and Back, pp 60 – 61.
69. 13 TFS history, 1 Apr - 31 July in 388 TFW history, Apr - Dec 67, Vol II, microfilm NO584, frames 0044 – 004.
70. Davis and Menard, Republic F–105 Thunderchief, p 46.
71. 388 TFW history, Sep - Dec 67 containing 388 AEMS history, April 67, USAF microfilm No 584 frames 0225 – 0226, 0234 – 0237, and 0173.
72. Major General Jim McInerney USAF (Ret), e-mail to author, Nov 1, 2004.
75. Pollard interview.
77. 388 TFW JOPREP/OPREP4 messages, 13 May 1967.
80. Thompson, To Hanoi and Back, pp 73 – 74.
81. Ibid. Navy CNA Loss/Damage Database, USAF losses 600 and 601, pp H22 and I22. Both crewmembers of the first F–4C, Capt Elton Lawrence Perrine and 1Lt Kenneth Frank Backus, were killed. The pilot of the second, Maj Richard Dale Vogel, became a POW. His rear-seat pilot, 1Lt David I. Baldwin, was rescued. Maj Vogel and his original EWO were released from Hanoi on March 4, 1973. Capt Perrine’s name is on the Vietnam Memorial Wall, panel 20E line 86. Lt Backus’ name is on panel 20E line 81.
86. Larry Huggins, e-mail to author, Dec 13, 2004.
88. 388 TFW history, Apr - Dec 67, USAF microfilm NO583, frame 1494 and Jim McInerney, e-mail to author Oct 12, 2005.
91. 13 TFS history, 1 Apr - 31 July 1967, USAF microfilm NO584, frames 0038 - 0040.
93. 388 TFW history, Apr - Dec 67, Vol II, 13 TFS history, 1 Apr - 31 July, microfilm No 584, frame 0045.
95. 388 TFW history Apr - Dec 67 containing 388 AEMS history, July 67, USAF microfilm No 584, frames 0246 - 0247.
98. 23 TFW history, Jan - Jun 67, USAF microfilm No 554.
100. 388 TFW history, Apr - Dec 67, Vol II, 13 TFS history, 1 - 31 Aug, microfilm No 584, frame 0053.
101. Ibid.
102. PACAF briefing to CINCPAC for the period 28 Aug - 17 Sep 1967.
103. Ibid.
104. Jim McInerney, e-mail to author, July 9, 2001.
105. 388 TFW history, Apr - Dec 67, USAF microfilm No 583. Lt Col McInerney and his original EWO Fred Shannon each received the Air Force Cross for leading the Wild Weasels during the Air Force’s first attack on Hanoi’s Paul Doumer bridge on Aug 11, 1967. See USAF in Southeast Asia Monograph 1 “The Tale of Two Bridges”, pp 67 - 87.
106. 388 TFW history, 1 Oct - 31 Dec 67, USAF microfilms No 584, frame 0031 and No 583 frame 1721.
107. 13 TFS history, 1 Sep - 17 Oct in 388 TFW history, Apr - Dec 67, Vol II, USAF microfilm No584, frame 0059.
The Unforgettable
B-29s: A Tribute

Yang Jing
Air Power

As we mark the sixtieth anniversary of V-J Day, ending World War II, it is fitting to pay special tribute to all of the martyrs who sacrificed their lives for justice and world peace. However, the story of a group of young American fliers who battled over Shenyang (known as Mukden, Manchuria) is not well known in China. Because these silent heroes truly deserve our unforgettable commemoration, this writer conducted a seven-month-long field search of the crash sites of the B–29s that fell near Shenyang. It is hoped that this refreshed memory will help enhance the traditional Sino-American friendship and mutual interest, as well as a harmonious coexistence of the whole world.

Air Raid over Shenyang

On December 7, 1944, 108 B–29s operating from Chengdu, China, were dispatched to bomb the Manchuria Airplane Manufacturing Company and an adjacent arsenal at Mukden. Eighty aircraft hit the primary target and ten others hit a rail yard short of the primary target; several additional strikes were made on alternate targets. Seven B–29s were lost on that day. Two weeks later, on December 21st, 19 of 49 58th Bombardment Wing B–29s, dispatched from Chengdu, attacked an aircraft factory and arsenal at Shenyang; eight B–29s attacked several alternates and targets of opportunity near Mukden. Two B–29s were lost on that day. During these two missions, 85 crewmembers of U.S. Army Air Forces (AAF) were killed, while another 14 survived from their bailout, but were captured by the Japanese military in that area. The American airmen were kept prisoners of war until August 15, 1945, when they were liberated.

Approaching the winter of 1944, anti-aircraft alarms were sounded all over Shenyang, while the Japanese military practiced the tactic of setting fires to envelop the arsenal area to obscure the target against aerial bombardment. S Sgt. Wult Huss, a B–29 survivor and POW (prisoner of war) at Shenyang, observed that this tactic was not really effective, because the smoke made it even easier for B–29s to locate their targets. On December 7, formations of American B–29s pounced in from Southwest Shenyang, causing panic among the residents of the city. The radio broadcasters, who reported the attack, were shrill in their announcements. As dense smoke filled the arsenal area, Japanese ground anti-aircraft forces fired back but could not reach the B–29s altitude. Local eyewitness recalled that the ground fire sounded like firecrackers exploding far below the B–29s. Meanwhile, about fifty Japanese Tojo fighters took off from several military airfields around Shenyang, including Fengji and Yuhong airports to block the B–29s. The B–29 gunners gave the fighters a sharp response. Nevertheless, the Japanese fighters still managed to ram a couple of B–29s. According to the latest research, the Japanese fighters rammed six B–29s and another three crashed due to unknown reasons in these two missions. Today, surviving local witnesses in the surrounding villages Yongle, Yong’an, Yangshi, and Yujia Wopu, still clearly recall and identify those crash sites (which is the most updated result of my field search). The bombardment severely damaged Japanese facilities. However, two missed targeted bombs hit a nearby prisoner of war camp where Allied forces were kept POWs, and killed 19 Americans and wounded 54.

Gone with the Wind

According to historical records, B–29 #42-6390 named “Gallopin’ Goose,” is believed to have been the first plane rammed over Mukden. SSgt. William Wootten, a crewman aboard B–29 #42-24486 “Windy City II,” witnessed the ramming of “Gallopin’ Goose.” In his account of the Japanese fighter that rammed #42-6390, SSgt. Wootten described the scene: “The fighter came in at us low and I gave him 50 rounds when he was 400 yards away. The fighter’s right engine started smoking and burning.” Sgt. Wootten saw pieces of the canopy fly off. Going down out of control and smoking profusely, the fighter then pulled up and slipped under #42-6390, hitting the left horizontal and vertical stabilizer and tearing them off. “I saw one parachute come out of #42-6390 before it hit the ground.”

“Old Campaigner,” B–29 #42-24175, was rammed on December 21, 1944. The pilot, Capt. Benedict was a West Point Military Academy graduate (1943). His father-in-law was Maj. Gen. O. P. Smith, USMC. Benedict had a daughter born in 1944, but he never made it home to see her. His father, also killed in a plane crash, had graduated from West Point with Gen. Dwight D. Eisenhower. The bombardier, Lt. Dailey, also had a daughter born in 1944, but never made it home to see her. Daily was studying to be a minister. Both daugh-

Yang Jing was born on September 26, 1960, in Shenyang, China. He is the Vice Chairman of the September 18th War Studies of Liaoning Province. He devoted more than ten years to the study of Mukden (now Shenyang), site of an Allied World War II prisoner of war camp run by the Japanese. He is an internationally recognized historian and a leading researcher in this field of study. A graduate of Chao Yang Teacher’s College and Shenyang Normal University, he also taught English and American literature. In the early 1990s, after devoting ten years to teaching, Yang Jing chose a career in the field of history. In 2003, Yang Jing wrote a book about the POW camp, entitled Mukden Nirvana, the first book published on the subject in China. Mukden Nirvana contributed a great deal in increasing the public’s awareness of the Mukden POW camp, which had been unknown to the Chinese for the past sixty years. Yang Jing’s wife, Professor Wen Chengwei, teaches at Shenyang University. Their teenage daughter attends the senior high school.
ters of the pilot and bombardier became American history teachers and had never meet each other until early 2003. The navigator, Lt. Evans, and Lt. Dailey were married to twin sisters. Lt. Dailey didn’t have any children. The flight engineer, Lt. Mahoney, was also a Pearl Harbor survivor. The right gunner, SSgt. Elmer Jelgerhuis had a twin brother, Alvin, who was also a gunner on B–29s in the same bomb group. When Elmer went down, Alvin was offered a trip back to the States, but he declined. He later went down over Japan, was made a POW, and was liberated at war’s end. SSgt. Edwards flew aboard “Old Campaigner” and passed out immediately after bailing out of the plane. He awoke when he reached the ground. His B–29 only went a short distance before its wing broke off, causing the plane to spin in. At the time he jumped, he had not realized how badly the plane was damaged. He never saw the plane crash and never saw the rest of the crew. According to eyewitnesses, soon after he landed on the northern bank of the Hunhe River, Japanese soldiers came up, blindfolded him, and then took him away in a motor-tricycle to prison. He went through prison camp thinking that the crew recovered the plane and managed to go on and that he had jumped needlessly. He didn’t learn what actually happened until the end of the war. The radio operator, SSgt. Edwards, named his only daughter “Pamela” after the daughter of the bombardier. The women also never met until early in 2003. The Flight Engineer, 1st Lt. Charles Krueger on board “Humpin Honey” was killed in action. He had twin sons born after he went overseas. Both of them become physicians.

According to a declassified document from headquarters, American Graves Registration Service China Zone, APO 917, July 18, 1947:

A. On 7 December 1944, B–29 #42-6299 (Humpin Honey) collided with a Japanese Aircraft in midair and crashed in an open field outside of Mukden, Manchuria. Two (2) men, S/Sgt. K.A. Beckwith 31134891 and Sgt. W.E. Huss, 35538620, were thrown clear and parachuted down. These men were captured and put in a prisoner of war camp by the Japanese. Later they returned to the United States. B. Two (2) other men, T/Sgt. K.A. Gwaltney, 13003838 and Sgt. H.H. Roth, 15353855, were thrown clear but in an unconscious state. Their chutes did not open and they were killed in falling
to earth. Of the remainder of the crew, only a few pieces of charred bones remain. The plane, upon crashing, burned with an intense heat and witnesses state no one survived.

Still MIA's?

Another crew that was lost on the Mukden mission was Aircraft #42-6359, the “Missouri Queen.” However the missing aircrew report lists it as “Vixen,” 770th Bomb Squadron.

7 December 1944 - Mission 19 to Mukden, Manchuria: #42-6359 was low on fuel and was going to try and land at a friendly airfield to refuel. 42-6359 was never heard from again. Statement from Capt. Harold R. Ebbeler: “Captain Johnson and crew in ship # 359 and designated as H-3 was flying in the same formation and same element as I was on 7 December 1944. For a while he was flying as lead ship of “C” element with my ship on his left wing and # 362 on his right wing. Shortly thereafter he took the right wing position and # 362 took lead at # 362 ship commander’s request. I heard Captain Johnson call the lead ship and tell him that he was
going to have to land at one of the fields on the route and refuel, as he was getting low on gasoline. He stayed with the formation, however, and when the formation started to penetrate the overcast, ship #359 was still flying #2 position of “C” element. As we proceeded into the overcast he was still in position and when our plane became lost from the formation at 0432 the ship #359 was still with us flying in the same element. We proceeded on individual navigation from this time on and had no further contact with Captain Johnson.”

Aircraft #42-6359 was believed to have crashed into a mountain at 36.07’ North and 112.39’ East on December 7, 1944. The above mentioned is identified as the mountain near Qinyuan Prefecture, southern Shanxi Province, which had been occupied by the Japanese. The entire crews are still listed as MIA but were declared dead by USAAF [Army Air Forces] in 1946.

On December 7, 1944, aircraft #42-6262, named “Roundtrip Ticket,” crashed between China and Mukden, Manchuria. This plane was seen in trouble but the plane was known to have reached the China Coast. A B-29 with solid red band around the fuselage was seen at between 2,000 and 5,000 feet, at 39 degrees 35’ N - 120 degree 00’E in trouble. Two aircraft went to help. Five chutes were seen in the water at 39 degrees 36’N-120 degrees 03’E at 0324Z and the ditched aircraft at 39 degrees 55’N - 120 degrees 40’E. This aircraft was known to have reached the China Coast with all four engines running and no visible signs of battle damage. It was not seen again after the formation crossed the coast and continued inland. At the time of crash, the Japanese soldiers in the area took all of the remnants of the plane with them, but left the bodies. Friendly Chinese villagers dug a common grave and placed the entire crew within. After war’s end, the grave was opened and the remains were recovered. Six men were positively identified, while the remaining five members of the crew have been identified as a group.
“Always Above”: Major Edward
‘Mick’ Mannock in World War I

Thomas G. Bradbeer
Air power on the Western Front was going badly for the Royal Flying Corps (RFC) in April 1917, when 2nd Lt. Edward Mannock arrived from England to join Number 40 Squadron. It was April 6, the same day the United States declared war on Germany, and the British Army’s long awaited spring offensive, the Battle of Arras, was to begin in less than 72 hours.

Aircrew casualties were growing at an ever increasing rate, alarming the RFC’s commander, Brig. Gen. Hugh Trenchard. In the first six days of the month alone, the 25 RFC squadrons along the Arras section of the front had lost 64 aircraft shot down with 42 aircrew killed, 9 wounded, and 36 more taken prisoner. This after having lost 143 airmen killed or missing in March. The RFC’s counterpart, the Deutschen Luftstreitkräfte (German Air Force), had lost only 12 aircraft during the same period, with 10 aircrew killed, two wounded and three more becoming prisoners of war. The aggressiveness of the RFC crews in accomplishing their commander’s edict of maintaining offensive operations no matter the cost was displayed daily. But also on display was the fact that the Luftstreitkräfte, outnumbered in aircraft by nearly two to one, had the technological superiority with faster, better armed aircraft and a core of highly trained pilots who were led by the likes of Manfred and Lothar von Richthofen, Ernst Udet, Werner Voss, and a host of others whose sole intent was to make the RFC pay dearly for every venture into German airspace over the Arras sector.

Whether Mannock knew it or not, once he signed into his new squadron he had joined a combat unit where the life expectancy for fledgling pilots was less than three weeks of operational flying. By the spring of 1917 the attrition rate for RFC pilots was nearing 200 a month. The RFC would be hard pressed to support the ground offensive but would put every aircraft at its disposal into the sky to support Field Marshall Haig’s latest attempt to break the deadlock in France. Only time would tell whether or not the newest member of Number 40 Squadron would become just another statistic or survive to make an impact in the air war over the Western Front.

Edward Corringham Mannock was born on May 21, 1888, to Sergeant Edward (Corringham) Mannock, a Scot and Julia Sullivan, an Irish girl from Cork. There is some argument about his birthplace. The most logical location is Preston Cavalry Barracks in Brighton, England, where Sergeant Mannock was stationed between 1887 and 1888 with the 2d Dragoons, the Royal Scots Greys. However, there is evidence that Mrs. Mannock may have returned to her family home in Ballincollig, County Cork, for some of the pregnancy before giving birth there to her third child.

Mannock’s youth was spent in Highgate, England, and Meerut, India, where he grew up in and around the area where his father was stationed. The family returned to England in 1902 to the Cavalry Depot in Canterbury. Young Edward had a fertile mind and loved to read any book he could get his hands on. He was very fond of his mother but distant from his often absent father. Self-conscious of the class system prevalent within the British Army and society as a whole, Mannock could not fathom the injustices that this system fostered among its own people. As he grew to manhood an intense hatred of the class system was bred within him that he would harbor his entire life. This intensity however would drive Mannock to make something of himself and at the same time he would attempt to improve the structure of a social system he believed was flawed and corrupt.

He completed his elementary education at the age of 14 but any further hopes of further education were dashed by his father. Upon completion of his military service in the Boer War (1899-1902), the senior Mannock separated from the British Army and within a few months proceeded to abandon his wife and family.

To assist his mother and older brother in providing for the family, young Mannock went to work delivering groceries and then served as a lather boy at a barber shop. Bright, literate, and well traveled for his young age, Edward Mannock strove to better himself and joined his older brother as a ledger clerk for the National Telephone Company in 1908. Office work was not to his liking, though, and after three years he requested a transfer (and a pay cut) to become a linesman. Leaving home in the spring of 1911, he moved to Wellingborough, Northamptonshire, a small town dependent on the iron works nearby. For the first time in his life he was truly on his own, but he relished the challenge. The work was demanding but it was outdoors and included much travel across the eastern portion of England.

It was during this period that Mannock developed a passion for cricket. During a game he ended...
up meeting a man who would have a major impact on him. A. E. (Jim) Eyles struck up a conversation with the younger Mannock and was impressed by his passion for the game but also his overall views on life. Finding out that Mannock was living in a rather rough section of town, Eyles asked if he wanted to move in with Eyles and his family. Mannock jumped at the chance.

During the next three years Mannock greatly developed both his mental skills and his confidence through his interaction with the Eyles, his wife and son. Nightly debates challenged his thoughts and his reasoning into organized arguments. He became politically educated as Eyles was an active member of the Independent Labor Party and Mannock was elected branch secretary of the Wellingborough Labor Club. He learned to play the violin and the piano under the tutelage of Mrs. Eyles. Athletically he developed into an excellent wicket keeper for the Wellingborough Wesleyan Cricket Club and also managed to play for the Wesleyan Football Club. Baptized a Catholic, he became an active member of his faith and attended mass every Sunday at St. Mary the Virgin church.

Before leaving Canterbury, Mannock had joined a Territorial unit, the 2d Home Counties Field Ambulance, Royal Army Medical Corps (RAMC) which enabled him to maintain contact with many of his friends whenever they conducted training. All in all, Mannock was leading quite a full life. Of this time spent with them Jim Eyles would later write of Mannock:

He knew there was something inside him, and he wasted no time in finding it. There was something different about him, a quality which held everyone he came in contact with … it was not mere ambition, because he was incapable of the cold ruthlessness that one finds in ambitious men; a kinder, more thoughtful man you could never meet.11

Keen for further adventure and primed to make his way in the world, Mannock sailed for Turkey in February 1914. Hired as a supervisor with the National Telephone Company in Constantinople, his leadership style produced results where other European managers had failed. Successful as he was, outside forces were about to bring his world to a crashing halt. When Britain declared war on Germany on August 4, the environment in Turkey changed drastically. Turkey’s neutrality was in question and after several warnings of the dangers of alliance with Germany, Britain declared war on Turkey on November 5. Mannock, along with most of the British and French residents were interned.

Through the help and efforts of the American ambassador, Mannock was released on April 1, 1915, after nearly five months of imprisonment. By the time of his release, Mannock was a physical wreck, emaciated from having suffered from a poor diet, dysentery, malaria, and the harsh Turkish winter.12

Arriving in Britain two months later, Mannock returned to the Eyles’ family who were shocked at his physical condition. Jim Eyles was surprised that the British Army accepted him when Mannock reenlisted into his old unit and within only a few weeks he was promoted to staff sergeant within the transport section. The next nine months the 3/2d Field Ambulance trained in Berkshire for deployment to the Western Front. By the spring of 1916, frustrated and anxious to get to grips with the enemy, and being told that all transport personnel would be reassigned to the Army Service Corps prior to deployment, Mannock requested a transfer to the Royal Engineers as an officer cadet. His strong leadership abilities and good service record set him in good stead. His transfer was approved and he joined the Royal Engineers on April 1, 1916.13 During his initial interview with Major J. E. Buchanan, the assistant battalion adjutant of the Royal Engineer Cadet Depot, recently promoted Sergeant Major Edward Mannock made quite an impression:

A tall, hard bitten-looking fellow stood before me, with more the appearance of a Colonial than an Englishman, blue-grey eyes, a thin clean-shaven face, and a rather grim expression.14
Major Buchanan was extremely impressed with Mannock and recommended he be commissioned. Two months later in June Mannock was duly commissioned a second lieutenant. After three months of initial training and with hopes of being assigned to France, Mannock had become bored with the daily training regime in England while a war was being fought across the English Channel. He was also quite chagrined to learn that he would need to undergo almost a year's worth of training before he would be assigned to a unit that specialized in digging tunnels and using explosives to destroy enemy trenches. Another factor for his growing disillusionment was his age. Almost all of his peers were 19 to 21 years old and at 28 Mannock had little in common with his fellow lieutenants. He rarely socialized with his peers and did not understand their views that war was a game when he knew it was not. As the days passed he became ever more anxious to get into the war and do his bit.

Possibly persuaded by the ever increasing casualty lists from France and the stalemate of trench warfare that awaited him, but more likely encouraged by an accidental meeting with an old friend who was an RFC pilot, Mannock took a chance and volunteered for flight training with the Royal Flying Corps in the summer of 1916. To his surprise Mannock's second transfer request in less than a year was approved and after passing a medical board August 2, he joined the commissioned ranks of the RFC. In his diary Mannock noted, "Now for the Bosche! I am going to strive to become a scout pilot like Ball. Watch me. I wonder what fate has in store?"

Before he could get to grips with the enemy, Mannock would have to successfully complete several months of training before he would be sent to an operational squadron. On August 14 he arrived at Number 1 School of Military Aeronautics at Reading where he was exposed to the theory of flight, navigation and aerial gunnery, and made several flights in the best of the RFC's training aircraft, the Avro 504. It was during this course that he earned the nickname of "Mick" which would stick with him long after his death. Mannock passed with honors and was posted to Hendon for his elementary flying instruction. Mannock was both competent and comfortable with his aircraft once he took to the skies. If he had one weakness during his initial training it was his landings. More than once he flipped his aircraft and several times he damaged the wheels of his machine with rough landings. He graduated on November 28 and was overjoyed when he received his Aero Club Certificate Number 3895.

He was sent to Number 19 Training Squadron at Hounslow on December 5 and upon completion of this phase of his training was posted to the Aerial School of Gunnery at Hythe for two weeks. There he mastered the use the Lewis machine gun, at that time the main armament for almost all RFC operational aircraft. He was then ordered to Number 10 Reserve Squadron at Joyce Green in late February 1917 for advanced flying instruction. It was here that Mannock became a pupil of the renowned air ace Captain (later Major) James T. B. McCudden.

The two pilots, one veteran, one novice came from similar social backgrounds. McCudden's father was a sergeant in the Royal Engineers and he came from a large Irish Catholic family. He served nearly three years as an enlisted man with the Royal Engineers before transferring to the RFC where he served as an air mechanic and then observer with Number 3 Squadron in 1914-1915. After promotion to Flight Sergeant he was sent back to England for flight training and returned in July 1916 just in time for the Battle of the Somme. It was during the summer and fall of 1916 that the RFC truly earned its aggressive reputation by winning control of the skies above the Somme, while the British Army struggled mightily on the ground in the hope of causing a breakthrough in that section of the front.

McCudden joined 20 Squadron, where he flew the FE 2B, a two seat pusher aircraft (the engine was behind the crew and thus pushed the aircraft...
through the sky versus a tractor aircraft in which the
engine was in front and pulled the machine for-
ward) with the observer/gunner seated in front of
the pilot in a bathtub-shaped nacelle and the
engine located just behind the pilot. Along with
the de Havilland DH 2 (the RFC’s first true scout or
fighter aircraft), and the FE 2B and D, these
pusher machines were able to wrest control of the
sky over the Somme from the German Air Service.

In August, McCudden was transferred to 29
Squadron, where he flew the DH 2 for seven
months scoring five victories and providing him
much valuable experience in both flying andfight-
ing the enemy. He was then posted back to England
as a flight instructor.

Though seven years Mannock’s junior, McCu-
dden not only became Mannock’s close friend but
also his mentor, teaching him much about flying
and the tactics he used so successfully in France
that would set the neophyte scout pilot in good
stead once he reached the Western Front. During
training McCudden demonstrated to his students
how to pull the DH 2 out a spin, which had made
the aircraft rather infamous and earned it the nick-
name of “Spinning Incinerator.” A day after
McCudden had briefed his students that it was
imperative that 2,000 feet was the minimum alti-
tude to put the DH 2 into a spin and survive,
Mannock soloed on the DH 2 and then promptly
put the DH2 into a spin at 1,500 feet above the air-
field. With some skilful flying he pulled out of the
spin and landed only a few yards from a munitions
factory loaded with high explosives, not far from
the airfield. Mannock insisted the spin was acci-
dental and McCudden believed him. However, the
squadron commander believed that Mannock had
intentionally put his aircraft into the spin and
threatened disciplinary action that could have
resulted in his dismissal from the course. Mannock
was relieved when told that the incident would be
closed and several weeks later he passed the course
and was posted to France on April 1. Five days later
he arrived at the airfield near Bruay, where 40
Squadron was located and his career as a scout
pilot would begin.

Mannock made a poor first impression with his
squadron mates. He violated the cardinal rule of
talking “shop” in the squadron mess upon meeting
his fellow pilots and further compounded the prob-
lem by asking each of them how many Germans
they had shot down. He also shared his views on
aerial combat. His peers expected the new guy to
keep his mouth shut and his ears open.

He had some training on pushers but had also had
a lot of time on tractor rotaries, and it was hard for
the men to see a new boy who had more time on the
type than them. . . Apart from that, he was “differ-
ent.” His manner, speech and familiarity were not
liked. He seemed too cocky for his experience, which
was nil. His arrival at the unit was not the best way
to start . . . he seemed a boorish know-all and we all
felt that the quicker he got amongst the Huns the
better; that would show him how little he knew.20

Mannock was assigned to C flight under
Captain Todd and was to fly a French-built
Nieuport 17, an agile single-seat aircraft whose
lower wing was less than half the width of its top
wing. It was armed with a single Lewis gun
mounted above the pilot’s cockpit on the top wing.
The Nieuport was also the same type of aircraft
that his hero, Captain Albert Ball, had flown with
Number 60 Squadron. Mannock made his first
operational flight on April 7 and over the next few
days conducted several flights to become more
familiar with the area over which 40 Squadron was
to operate. As the days passed his reputation how-
ever, went from bad to worse as rumors spread that
Mannock was “yellow.” His peers believed that he
had been hesitant in the few opportunities in which
he had faced the enemy, was overly cautious and
had become a liability to himself and the other
pilots in the squadron. If there was any good news,
it was the fact that his squadron commander, Maj.
Leonard Tilney, understood his subordinates and
could see that Mannock, older than the rest of his
fellow pilots, was using his judgment and intelli-
gence to adapt and come to grips with his new pro-
fession and was not as reckless as the younger
pilots in the squadron.

His flew his first sortie over the lines on April
13 and experienced what it was like to fly through
antiaircraft fire. Later that same day, while con-
ducting aerobatics and target practice against
ground targets from 2,000 feet he found himself in
a life or death situation. At 700 feet the lower right
wing of his Nieuport broke and separated from the
fuselage. With coolness and skill, Mannock was
able to walk away without a scratch and at the
same time earned some respect from his fellow
pilots who admired his ability to land the crippled
plane without killing himself.

Throughout the remainder of April and the
first week of May, Mannock concentrated on the
finer details of his trade, believing they might
make the difference between life and death in com-
bat. He directly supervised all maintenance on his
aircraft and advised the squadron armorer that he
would personally sight his machine gun. He reset
his sights to align at 30 yards and then had his
Nieuport rolled over to the firing range where he
then synchronized his machine gun. Mannock also
personally inspected and loaded each bullet into
the ammunition drums that fed his assigned Lewis
gun. This was a very wise decision due to the fact
that the numerous British factories contracted to
produce machine gun and rifle ammunition were
allowed a certain band of tolerance in the size of the
bullet casing and those with slightly larger casings
were renowned for causing jams and stoppages
when the Lewis gun was fired. Mannock was con-
vinced that the hours spent conducting this metic-
ulous task would pay dividends when he encoun-
tered enemy aircraft at close quarters.

When “Bloody April” ended, the RFC had suf-
f ered the worst losses in one month of the entire

THE SQUADRON COMMANDER BELIEVED THAT MANNOCK HAD INTENTIONALLY PUT HIS AIRCRAFT INTO THE SPIN AND THREATENED DISCIPLINARY ACTION
war with 211 pilots and observers killed, 116 wounded, and a further 108 taken prisoner. Aircraft losses from combat action totaled 245. It had been an extremely bad month for the RFC. Mannock had survived his first three weeks in combat and slowly, but surely, was beginning to demonstrate his capabilities as a scout pilot.

Mannock’s attention to detail paid off and on May 7 he was credited with his first victory. He later recorded the events in his diary:

Went over the lines from north of Arras to 5 miles behind the German trenches at a height of less than 15 feet, attacking Hun balloons...Six of us-Captain Nixon (missing), Hall, Scudamore, Redler, Parry and myself. All except the Captain returned safely with machines almost shot to pieces. Hall crashed on home aerodrome, as did Scudamore, Parry crashed just our side of the lines at the Canadian H.Q. Redler crashed at Savy, but returned here later and damaged his machine on landing. I was the only one to return properly to the aerodrome, and made a perfect landing. We all got our objectives. My fuselage had bullet holes in it, one very near my head, and the wings were more or less riddled. I don’t want to go through such an experience again.

After four weeks at the front, Mannock had accomplished what few pilots could do: attack and destroy an enemy observation balloon, a high value target protected with multiple antiaircraft batteries and usually one or two flights of aircraft, and then successfully return to base. At the end of the same day the RFC lost its premier scout pilot, Capt. Albert Ball when he was killed while engaging in aerial combat with von Richtofen’s Jagdstaffel (Hunting Squadron or Jasta) 11. There is no entry in Mannock’s diary about how this dire news affected him; but it is evident that many scout pilots within the RFC began to question their chances of surviving the war, especially when one of their very best pilots could be killed.

Between mid-April and the beginning of June Mannock had more than a dozen air combats with enemy machines, but was not able to claim a victory. On at least three occasions he was certain that he had forced down either an Albatros or Halberstadt two-seat observation aircraft, but without confirmation by a second source (another pilot or a British or Allied unit on the ground) was not given credit and he never pressed the issue. However, he resolved that the next time he would, in fact, have witnesses or physical evidence that he had in fact shot down an enemy machine.

Towards the end of May, 40 Squadron received a new batch of pilots, one of whom, Lt. William MacLanachan, received a frosty reception from both the commanding officer and most of the other pilots in the squadron after nearly crashing his Nieuport on his arrival flight to join the squadron. Shortly thereafter, MacLanachan met Mannock, who provided him some kind words and guidance. From that day on a strong friendship developed between the young Scot and older Mannock. Mannock would serve as the young Scot’s mentor, the first of many pilots who Mannock would take under his wing to teach, counsel, and develop into effective scout pilots over the course of the next fourteen months. Mannock would nickname MacLanachan “McScotch” to differentiate him from another of his pupils, Gerorge McElroy who was from Dublin and thus nicknamed “McIrish.” McElroy scored 46 victories before he was shot down and killed on July 31, 1918. MacLanachan would survive the war with 21 victories and in 1936 would write an excellent memoir of his time in 40 Squadron with Mannock.

Mannock was officially credited with shooting down his first enemy aircraft, an Albatros DIII fighter, on June 7 and two days later shot down another of the same type. This time his victories were observed and confirmed by several pilots in his flight.

During this period the daily stress of multiple air combats and the constant loss of fellow pilots became almost unbearable for Mannock. His diary entries confirm that the psychological strain on him was building and there was ample evidence that unless he was given a break from combat the damage would be irreparable. His greatest fear, shared by many RFC pilots who were not issued parachutes (though they were issued to balloon observers and saved many a life), was to be shot down in flames. To counter what would become a premonition, he began carrying a Colt revolver when he flew, telling MacLanachan that he would use it on himself if his aircraft ever caught fire.

On June 12, Mannock suffered an injury that almost ended his flying career. Returning from a patrol he lifted his goggles to his forehead and just as he approached his airfield to land a tiny piece of metal entered his right eye, which caused searing pain and temporarily blinded him. He somehow managed to land his Nieuport without mishap. He was carried from his cockpit to the squadron medical officer and fainted when the doctor attempted to remove the object. Rushed to a hospital he was given cocaine to ward off the intense pain before a surgeon attempted to remove part of the metal object. Unable to sleep and still in intense pain Mannock required two further trips to the hospital to remove several more pieces of metal which in fact were found to be minute specks from his aircraft’s cowling.

Wearing a large bandage over his right eye Mannock was excused from operational flying but did make several flights to neighboring squadrons to visit old friends and discuss tactics. Mannock was then given two weeks leave and sent back to England to recuperate, not only from his eye injury but also to assuage his frayed nerves.

After rejoining the squadron in early July, a refreshed Mannock proceeded to shoot down 14 enemy aircraft over the next eight weeks. One of his victories would have a lasting effect on him, causing much reflection and pain. On July 12, he attacked a German DFW two-seater and after fir-
Mannock’s Rules of Air Fighting

Always Above, seldom on the same level; never underneath (specifically addressing the attacking of single seat fighters)
Pilots must dive to attack with zest, and must hold their fire until they get within one hundred yards of their target.
Achieve surprise by approaching from the East. (From the German side of the front.)
Utilize the sun’s glare and clouds to achieve surprise.
Pilots must keep physically fit by exercise and the moderate use of stimulants
Pilots must sight their guns and practice as much as possible as targets are normally fleeting.
Pilots must practice spotting machines in the air and recognizing them at long range, and every aeroplane is to be treated as an enemy until it is certain it is not.
Pilots must learn where the enemy’s blind spots are.
Scouts must be attacked from above and two-seaters from beneath their tails to take advantage of the observer’sblindspot.
Pilots must practice quick turns, as this maneuver is more used than any other in a fight.
Formation flying at 25 yards must be practiced.
Pilot must practice judging distances in the air as these are very deceptive.
Decoys must be guarded against — a single enemy is often a decoy — therefore the air above should be searched before attacking.
If the day is sunny, machines should be turned with as small bank as possible, otherwise the sun glistening on the wings will give away their presence at a long range.
Pilots must keep turning in a dogfight and never fly straight except when firing.
Pilots must never, under any circumstances, dive away from an enemy, as he gives his opponent a non-deflection shot—bullets are faster than aeroplanes.
Pilots must keep their eye on their watches during patrols, and on the direction and strength of the wind.

Had the good fortune to bring a Hun two-seater down in our lines a few days ago. Luckily my first shots killed the pilot and wounded the observer (a captain) besides breaking his gun. The bus crashed south of Avion. I hurried out at the first opportunity and found the observer being tended by the local M.O. and I gathered a few souvenirs, although the infantry had the first pick. The machine was completely smashed, and rather interesting also was the black and tan terrier-dead-in the in observer’s seat. I felt exactly like a murderer. The journey to the trenches was rather nauseating-dead men’s legs sticking through the sides with putties and boots still on-bits of bones and skulls with the hair peeling off, and tons of equipment and clothing lying about. This sort of thing, together with the strong graveyard stench and the dead and mangled body of the pilot (a NCO) combined to upset me for a few days.

A week later Mannock was awarded the Military Cross, promoted to Temporary Captain, and made a flight commander. Most of his critics within 40 Squadron finally began to realize that they had misjudged Mannock and except for one or two pilots, the majority at last accepted him into their fold. He began to realize that the day of the lone wolf pilot operating on his own and scoring victories (or getting killed) by himself was past. Always a reflective thinker, he spent much of his time on the ground thinking through aerial tactics and the best way to defeat the Luftstreitkrafte Jasta’s that opposed the RFC, and in particular 40 Squadron. After four months in combat he realized that it was a mistake to underestimate the skill of their German counterparts and that as a flight leader he had to put the interests and welfare of the four other men in his flight before his own personal gain. Focusing on formation flying, gunnery, discipline, and teamwork he started off slowly but quickly began to build his “A” Flight into one of the most cohesive fighting units in the RFC.

During this time, he was becoming an effective leader both on the ground where he served as a coach and mentor to quite a few pilots such as MacLanachan, McElroy, Lewis, and more. In the air, he had unlimited opportunities to test his theories of attack, and used the maneuverability of the Nieuport to ensure his flight had the advantage before attacking. He studied the capabilities of the German aircraft they faced and deduced the strengths and weaknesses of each and, thus, the best way to defeat them. By the end of 1917, he was awarded a bar to his Military Cross and was credited with 21 confirmed victories.

When Mannock left his squadron in January 1918 to return to an assignment in England, the road leading away from the airfield was lined with ground crews and pilots who showed their respect and admiration with a cheering ovation, which nearly brought the humble Mannock to tears. Long forgotten was the frosty reception he had received at his arrival ten months before. Major Tilney, the squadron commander, who had done much to allow Mannock to develop and grow both as a scout pilot and a leader, recorded in the squadron diary upon Mannock’s departure: “His leadership and general ability will never be forgotten by those who had the good fortune to serve under him.” Gwilym Lewis, a veteran pursuit pilot with more than two years combat experience before he served with Mannock in 40 Squadron would later write:

He left the squadron with 21 victories and his victories were good, he came on to form having been older than most of us and a more mature man. He had given great, deep thought to the fighting game and had reoriented his mental attitudes which was necessary for a top fighter pilot. He had got his confidence and he had thought out the way he was going to tackle things.
DURING HIS TIME WITH “TIGER” SQUADRON HE SCORED 36 CON-FIRMED VICTORIES AND WAS AWARDED THE DISTIN-GUISHED SERVICE ORDER AND BAR

After thirty days leave, Mannock was sent to the RFC airfield at Biggin Hill. Shortly after arriving there he met Maj. Gen. Sir David Henderson, Director General of Military Aeronautics and the senior man in the RFC. He complained to Henderson about not being in France and even threatened to go back to the Front without orders. Henderson realizing this was probably a fight he didn’t want to win, took quick action and Mannock was posted to 74 Training Squadron then at London Colney airfield.

74 Squadron was equipped with a relatively new pursuit aircraft, the SE (Scouting Experimental) 5a, an improved version of the SE 5, which had been introduced into operational service in the fall of 1917. Mannock had flown it during his last weeks in 40 Squadron and was one of many pilots who experienced major problems with both its 200 h.p. Hispano Suiza engine and the synchronization gear of the fuselage mounted Vickers machine gun. Modifications had been made to correct these deficiencies and once in combat the SE 5a would prove to be one of the best Allied scout aircraft of the war.

Assigned as “A” Flight Commander, Mannock was also responsible for the squadron’s training program and he spent countless hours teaching and training the mixture of experienced and neophyte airmen. He placed great emphasis on individual responsibility for each pilot’s aircraft, the sighting and loading of the aircraft’s machine guns, ballistics, aerodynamics, and meteorology as well as formation flying, teamwork, and the tactics he had used so successfully in France. His students responded with an intensity not seen before by the squadron commander. Not only was Mannock an effective communicator, he was a great motivator and was extremely effective at instilling in his pilots the pride and aggressiveness they would need to overcome the challenges that awaited them on the Western Front. It was during this training phase that Mannock stressed his “Rules of Air Fighting” with his foremost concept: of “Always above; seldom on the same level; never underneath” and had it painted on the walls of the aircraft hangars and classrooms.29

Mannock’s Rules of Air Fighting were similar to those of the famous German pilot and tactician, Hauptmann Oswald Boelcke, who in 1915-1916 scored 40 aerial victories and served as the mentor of numerous German pilots, most notably Manfred von Richthofen (The Red Baron). Boelcke was killed in aerial combat during a dogfight with the RFC’s 24 Squadron when his aircraft collided with another aircraft in his flight.

On March 30, 1918, 74 Squadron flew to France. While en-route on April 1, Mannock celebrated his three year anniversary from his release from a Turkish prison and at the same time the news that Royal Flying Corps and the Royal Naval Air Service had combined to become the Royal Air Force (RAF).

The latest scout squadron to join the fray on the Western Front became operational on April 11 at its airfield at Clairmarais. The next morning, while leading “A” Flight, Mannock scored the first official victory for 74 “Tiger” Squadron. It was an auspicious beginning for what would become one of the best scout squadrons in the RAF.

At the start of his second tour in France, Mannock developed what became known as post-patrol debriefings or after action reviews. These debriefings would later become standard operating procedure in all RAF squadrons. Given full rein by his squadron commander, Maj. Keith L. Caldwell, a New Zealander, Mannock planned and rehearsed all flights before they ever left the ground. Every contingency that could occur in the air or in combat was reviewed and once a patrol returned the debriefings focused on each pilot’s actions in the air. Mannock continually stressed teamwork and had no problem tearing into a pilot who had made a mistake that placed the rest of the flight in jeopardy. Immediately after the dressing down he would then offer sage counsel that the offender was wise to heed.

Mannock flew and fought with 74 Squadron for only three months before he was sent on leave in late June. During his time with “Tiger” Squadron he scored 36 confirmed victories and was awarded the Distinguished Service Order and Bar. The first award was attributed to his “conspicuous gallantry and devotion to duty during recent operations. In seven days, while leading patrols... he destroyed seven enemy machines, bringing his total to thirty. His leadership, dash, and courage were of the highest order.”30 The second award acknowledged his destruction of “Eight machines in five days—a fine feat of marksmanship and determination to get to close quarters.”31 More importantly, he imbued throughout the squadron a spirit of camaraderie and teamwork that established it as one of the premier scout squadrons within the RAF. Seeing the success that Mannock was having as a flight leader in his squadron, XI Wing directed Mannock spend some time visiting the other squadrons within the wing so that he could present his views on air tactics and his lessons learned. Thus, by early summer, Mannock’s reputation as one of the premier tacticians within the RAF was confirmed.

Mannock served as a teacher and mentor to all the pilots within 74 Squadron, but there were three new pilots, who developed a close relationship with him and espoused his teachings and methods for air combat. The first, Lt. H. E. Dolan, had won the Military Cross while serving in the Field Artillery. The second was a 17-year-old South African, Lt. P. F. C. “Swazi” Howe, and the third was a diminutive Welshman, Lt. Ira T. Jones. Through Mannock’s mentorship, Dolan would shoot down eight enemy aircraft in six weeks before being killed in action. His loss was deeply felt by the squadron, but most especially by Mannock. It had a long lasting impact on him and especially his psychological outlook on the war and his own survival. Howe, born in Swaziland, had joined the RFC the year before by giving a false age. Determined and steadfast as he was, this did not assist him in his marksmanship,
which was very poor. Under the tutelage of his flight leader and numerous hours of coaching, Mannock took him aloft and allowed Howe to finish off an Albatros fighter that he had already crippled. Upon landing, he ensured Howe received credit for the victory. It was not the first time Mannock did this and according to Caldwell it happened on at least five other occasions. Jones would achieve 40 victories by the war’s end and become a career RAF officer with service in the Second World War. He would write three books about his experiences in the RFC/RAF in the First World War. But it was his classic biography of Mannock that would earn him a lasting place in the field of aviation military history.

Mannock returned to England for a brief leave and learned he was promoted to major and would assume command of 85 Squadron. He spent much of his leave with his old friend Jim Eyles and his family. It was evident to the two adult Eyles that the man they considered their second son was in a bad way. His nerves were frayed and his quick humor was gone. Several times they caught him crying uncontrollably and he had trouble sleeping. When Mannock left at the end of his leave, Jim Eyles sensed that it was the last time he would see Mannock alive.

Mannock returned to France on July 5, and took command of 85 Squadron. The unit was in a bad way and suffered from low morale. Mannock had replaced the Canadian ace, Maj. William “Billy” Bishop, who had spent most of his time conducting lone-wolf operations and building up his personal score of enemy aircraft. Bishop was not an advocate of formation flying or using flights and squadrons to fight as teams. He basically adhered to the edict that once in the air it was every man for himself. Faced with the toughest leadership challenge of his flying career, Mannock accepted the challenge head-on.

Realizing he had many experienced and seasoned pilots, including three Americans and several Canadians, Mannock quickly established himself as the squadron commander. He began to apply his now famous training methods to build his new squadron into an effective combat unit. With a commander who provided both motivation and purpose, but also cared about their survival, the men of 85 Squadron rose to the occasion with almost immediate results. Casualties dropped off quickly and enemy losses grew.

On July 7, Mannock led the entire squadron across the lines, and allowed his flight to act as decoys, while the other two flights flew at different altitudes and quite away from one another. Within minutes several flights of German Fokker DVIIIs took the bait and attacked. Mannock had briefed his pilots that they should not engage until he signaled them by firing a red Very light. He did not give the signal until the enemy formation was already committed to the attack. Seconds after firing the Very light the Germans found that they had become the hunted. When 85 Squadron returned to St. Omer they had shot down five of the best enemy
machines at the front and suffered no losses of their own.\textsuperscript{34} Mannock’s methods had yielded visible evidence of why he was quickly becoming a legend within the ranks of the RAF.

On July 10, Mannock received the horrible news that his mentor and hero, Maj. J.T.B. McCudden had been killed the night before. His SE 5a had crashed shortly after takeoff, when he was en-route to assume command of 60 Squadron. First Ball, then McCudden. Both his heroes were dead and it sparked an intensity in Mannock not seen before. Bent on revenge, he spent much of the next week airborne, searching for the enemy. He drove himself relentlessly and began to ignore his own guidance that had kept so many of his pilots alive. He took unnecessary risks, flew too low for too long and broke his cardinal rule of never following a defeated aircraft down to the ground. On July 14, he badly damaged a German two-seater and followed it to the ground until it crashed. He then made several passes where he strafed the wreckage ensuring the crew was in fact dead.

Once the week ended, Mannock seemed to return to his old self. Behind his back his pilots referred to him as “The Iron Man” because no matter how many hours he spent in the air or on patrol he never showed signs of weakening. He became preoccupied with the neatness of his uniform, began to polish his boots and talked openly about a premonition that he had about his death, telling several confidants that he was approaching “something final.”\textsuperscript{35} In his last letter home, he wrote “I feel that life is not worth hanging on to...had hopes of getting married, but...”\textsuperscript{36} Ira Jones, now commanding Mannock’s old flight in 74 Squadron telephoned Mannock to
inform him of his latest two victories. After accepting an invitation for lunch for the next day, Jones informed Mannock that “they’ll have the red carpet out for you when you get back to England after the war.” "There won’t be any ‘after the war’ for me,” Mannock replied.37

During the luncheon Mannock asked Lt. Donald C. Inglis, a New Zealander who had been with 85 Squadron almost two months, if he had shot down an enemy aircraft. Receiving a negative reply the squadron commander replied, “Well, come on out and we’ll get one for you.”38 Inglis’s aircraft, however, had a maintenance problem, so they postponed the flight till the next morning.

At 0430 on July 26, 1918, Inglis met Mannock in the squadron mess where his squadron commander briefed him on the upcoming dawn patrol:

We will head up the lines to see if we can spot one of their two-seaters that come over in the early hours of the morning to spot our guns and shoot up the infantry. Follow my movements exactly and stay close behind on my left. I’ll waggle my wings when I’m going to change course and point out any Huns I see. If he’s a two-seater, come in close behind and underneath. I’ll have gone in first, so you should get a good idea of what it’s all about. Don’t fire until your sights are dead on, then give him all you’ve got.”39

Approximately one hour later, the two SE 5a’s were at 5,000 feet above and behind the German trenches between Bethune and Hazebrouck. Suddenly, Inglis noticed his squadron leader’s wings waggling left then right. Mannock’s outstretched arm pointed towards the ground. Far below them was a Junkers CL1 monoplane flying parallel to the lines. The Junkers was unique in that not only was it a monoplane, but it was also an all metal two-seater aircraft that had just become operational two months before. The Germans used it primarily for escort duties and ground attack missions. It would prove to be one of the best ground attack aircraft on either side in the entire war.

The German pilot, Lt. Ludwig Schopf and his observer, Sgt. Joseph Hein, did not see the two brown-painted British SE 5a’s until it was too late. The Junkers was raked with a stream of fire from Manock’s Vickers and Lewis machine guns, killing Sergeant Hein. Seconds later, Inglis’ SE 5a, seemingly only yards behind the German aircraft, sprayed the fuselage with bullets, puncturing the Junkers’ fuel tank and setting the aircraft afire. Within moments it was all over as the two-seater fell over on its nose and crashed near La Cix Marmuse.40

At a height of 200 feet Inglis observed his squadron commander below him circle the crash site of the destroyed Junkers. Mannock was violating one of his own basic rules for air fighting. They were over German manned trenches near the village of Pacaut when Mannock, now at 40 to 50 feet above the ground, turned to head back to the British lines. The two aircraft were met by a barrage of ground fire as they flew low over Pacaut Wood. Mannock’s aircraft was hit. Inglis watched in horror as his squadron commander’s aircraft burst into flames. With little air space to maneuver the SE 5a’s nose dropped and the aircraft went into a slow right hand turn before hitting the ground near La Pierre au Beure, just a few hundred yards from the British trenches. There, infantryman from the 2d Essex Regiment had observed both the destruction of the Junkers and the SE 5a crash.41

Inglis circled the wreckage of Mannock’s aircraft and saw no signs of life. His SE 5a received a fusillade of ground fire and his fuel tank was ruptured. He was barely able to turn and glide over the trenches, where he made a forced landing near a company from the Welsh Regiment. When the infantrymen pulled the young New Zealander, soaked in petrol, from his cockpit he was nearly in

SE 5a’s from 85 Squadron, RAF, 21 June 1918. Lined up on their airfield at St Omer. Mannock took command of the squadron from Major William ‘Billy’ Bishop, VC on 8 July and in two short weeks made great strides in rebuilding the unit’s morale, esprit de corps and teamwork. On their first patrol, led by Mannock, the squadron shot down five German aircraft without loss. Note the streamers on the tailfins of the first, fifth, and tenth aircraft denoting Flight Leader status. (IWM: Q12051)
MANNOCK'S DEATH WAS DEVASTATING TO THE MEMBERS OF 85 SQUADRON AND THE RAF AS A WHOLE

a state of shock. “All I could say when I got into the trench was that the bloody bastards had shot my Major down in flames.”

In his biography of Mannock, James M. Dudgeon believes that Mannock was attempting to fan the flames away from his aircraft by conducting several turning movements before he crashed. Based on the observations of Inglis and the British soldiers on the ground who observed Mannock’s aircraft before it crashed, it is more likely that he was killed instantly by the ground fire. After investigating the details behind Mannock’s last flight, Maj. Keith Caldwell, Mannock’s squadron commander during his tour with 74 “Tiger” Squadron, later wrote, “If the flames appeared at the same time that Mannock stopped kicking his rudder, the burst that set him on fire was probably fatal to him also. It is my opinion that Mannock was hit in the head.”

At least one writer has written that Mannock used his Colt revolver and shot himself before he was burned alive. This is mere speculation and highly improbable. At an altitude of approximately 40 feet, a badly damaged aircraft that was also on fire would remain airborne for no more than two or three seconds before it crashed. Mannock would have had no time to attempt shooting himself. And, if he was alive, as some suggest, he would have more than likely concentrated on conducting a forced landing before the flames took hold of his machine. Mannock may have been suffering from combat exhaustion at the time of his last flight, but he did not have a death wish.

Another issue that has long plagued researchers is the question of where Mannock was buried. Several writers have stated that Mannock, along with his SE 5a was consumed in flames and thus there were no remains to bury. This is incorrect, for we do know that German infantrymen retrieved Mannock’s body from his aircraft and buried him several hundred yards from the wreckage. The coordinates were duly passed to the German Red Cross. It wasn’t until 1920 that this information was processed through international channels and made it to the Commonwealth War Graves Commission, who long after the war, was still in the process of locating and recovering the remains of thousands of British servicemen. Today the hundreds of military cemeteries in northern France and Belgium are a testament to their magnificent efforts to remember the dead and missing of that war.

With the information it had received through international channels, a search team from the Commonwealth War Graves Commission was able to locate the body of an unidentified British flying officer just north of La Pierre au Beure, only a few hundred feet from where Mannock’s SE 5a crashed. The airman had been stripped of his personal effects and identification discs. Unable to positively identify the body the airman was buried in the nearest military cemetery at Laventie. “Grave 12, Row F, Plot 3. Unknown British Aviator” is more than likely the final resting place for the RAF’s greatest patrol leader of the First World War.

Strangely enough in the same row and near his mentor lies the body of George McElroy. “McIrish” was shot down only five days after Mannock in similar circumstances: by ground fire after he flew too low over the wreckage of a German aircraft he had shot down only moments before.

Several years after the war Mannock’s older brother, Patrick, received a package from Germany. The box contained Mannock’s tunic, identity disc, Colt revolver and his notebook. None of these items were burned and only the notebook, which Mannock carried in the outside pocket of his flying coat, showed any signs of having been in or near fire. It was only slightly browned around the edges, proof positive that Mannock had not been burned to death or his body consumed by flames. Today only the identity discs remain and are on display at the RAF Museum in Hendon, England.

Mannock’s death was devastating to the members of 85 Squadron and the RAF as a whole. Arguably his loss had far greater impact on the RAF than Manfred von Richthofen’s death was to the Lufstreitkrafte when he was shot down and killed three months before Mannock. The British squadron commander’s record as a leader, trainer, and mentor were unmatched throughout the RAF. Four months later the war ended and Mannock, a legend in the RAF, but unknown by the British public was all but forgotten. If it had not been for the likes of his friend Jim Eyles and one of Mannock’s protégés, Ira Jones, his name and his accomplishments may have been lost to all outside of the RAF.

With hostilities over, Jim Eyles, Ira Jones, and several civilian leaders from Canterbury and Wellingborough began a campaign to gain official recognition for Mannock’s accomplishments. With the assistance of the Secretary for Air, Winston Churchill, a debate was started within the Air Ministry to discuss whether or not awards could be issued retroactively for acts of heroism. After only a few weeks of study and analysis of Mannock’s overall record and performance, the recommendation to award him Britain’s highest military award was approved. On July 11, 1919 Maj. Edward C. Mannock, DSO and two bars; MC and Bar was awarded the Victoria Cross posthumously.

Today aviation historians still disagree on two unresolved issues that concern Mannock’s operational career within the RFC/RAF. The first concerns the number of victories he achieved while with 40, 74, and 85 Squadrons. The citation for his Victoria Cross printed in the London Gazette on July 18, 1919, stated that he was responsible for the defeat or destruction of 50 enemy aircraft, but his supports in 74 Squadron argued that Mannock had achieved that many victories by early May 1918, and that higher headquarters had failed to take into account aircraft he shot down during May through July with both 74 and 85 Squadrons. After the war he was credited with 73 victories by the Air Ministry and this number became entrenched as fact when Ira Jones published it in his biography of Mannock in 1935. In
1981, after years of research and analysis of British and German records, noted Mannock biographer, James Dudgeon published his results of how many aerial victories could be attributed to the RAF’s most successful fighter pilot. Dudgeon was only able to account for 61 confirmed victories during Mannock’s 14 months of operational flying. The renowned First World War aviation historian, Norman Franks, later confirmed Dudgeon’s findings. Today historians still argue over this issue.
and whether or not Mannock was Britain's "Ace of Aces." The fact remains that regardless of total victories, he was still one of Britain's best scout pilots and as a flight leader he was without peer.

The second issue concerned Mannock's eyesight. Much has been made about him being blind in one eye which grew into the "Ace with One Eye" legend that it has become over the last eighty-seven years. In fact Mannock suffered from a severe eye infection in his left eye when he was a youth in India but there is little evidence that it became a permanent affliction. Aside from the rigorous testing the RFC conducted on its aircrew applicants and the fact that on three separate occasions Mannock was found to have perfect vision in both eyes, the question must be asked: How could a front line scout pilot survive the rigors of 14 months of near continuous combat with little or no vision in one eye? Mannock's relatives and comrades in arms repeatedly reported that his eyesight was as good as, if not better, than the average person. Both Maj. Keith Caldwell (Mannock's squadron commander) and Lt. H.G. Clements (Mannock's wingman) in 74 Squadron were on record for stating that Mannock had first-class eyesight. Furthermore, most writers and historians tend to forget Mannock's near fatal crash on June 12, 1917, when minute pieces of his cowling entered his right eye. After several operations to remove the foreign objects and with his right eye heavily bandaged, he still managed to conduct several sorties to visit nearby friendly squadrons behind the British lines. How could he have done this if he was blind in his left eye?

Whether he shot down 61 or 73 enemy aircraft before he was killed, the total number is only relevant in the fact that he did shoot down more than five dozen aircraft and survived a year and a half in an extremely hazardous environment that claimed thousands of his fellow air fighters on both sides. To have done this with one eye would be highly improbable and nearly impossible.

Mannock's legacy was not how many aircraft he shot down, but the tactics and techniques that he passed onto so many pilots within the RFC/RAF. His Rules for Air Fighting were used throughout the interwar years to train the next generation of fighter pilots and the results of his legacy were demonstrated by RAF Fighter Command's victory over the Luftwaffe in the Battle of Britain in 1940. He was one of the first pioneers of formation flying and most, if not all, of his rules for air fighting, regardless of the increased speeds of the aircraft, were, and still are applicable today as they were in 1918. Most importantly though his emphasis on and demonstration of selfless service, teamwork and direct level leadership were traits and skills that made him stand out among his peers. He will be forever remembered for his leadership and the example he set for all those with whom he served.

Idolized by those who flew with him, immortalized in the written works of his protégées such as Jones and MacLanachan, Mick Mannock truly was the greatest patrol leader of the First World War. Major Caldwell, Mannock's squadron leader in 74 Squadron paid a lasting tribute to Mannock when he wrote:

...but other things go to make greatness, such as leadership, morale-building selflessness, comradeship, cheerfulness, individuality and many other virtues which Mick Mannock possessed in full. He was not only the outstanding pilot of World War One but a man in the full sense of the word, much older than he should have been for the stresses he bore, a warm, lovable individual, of many moods and characteristics, and I will always salute his memory.

Today Mannock is remembered primarily in the towns and cities in which he grew up. A memorial plaque in Canterbury Cathedral honors him and an annual memorial service is held to commemorate his life. In Wellingborough a housing estate is named for him and his portrait hangs on display at the town's library. The Heritage Center has two display cases featuring Mannock and his ties to both the city and the RAF. The RAF Museum at Hendon has a display case dedicated to him, which features his awards, decorations, and identity discs. The only official memorial to Mannock, however, is located in France, where his name can be found on the Arras Flying Services Memorial to the Missing, on the Boulevard du General de Gaulle, in Arras. His name is alongside 1,000 other RNAS/RFC/RAF aircrew who were listed as missing on the Western Front. 

NOTES

2. Ibid, p 2.  
3. After losing air superiority to the British Royal Flying Corps over most of northern France during the spring and summer of 1916, Kaiser Wilhelm issued a decree that made significant and positive organizational changes to German aviation forces in the field. One of the changes in force structure included the German Army Air Service being re-designated as the Deutschen Luftstreitkrafte (literally German Air Combat Unit but translated to German Air Force) on October 8, 1916.  
Patrol Leader Supreme, (Falls Church, Va: Ajay Enterprises, 1977), identified May 21, 1888. Frederick Oughton wrote the introduction and annotations for the 1966 publication of Mannock's 1917 diary, also states that he was born on May 21, 1888. The latest Mannock biographer, Adrian Smith, provides the most convincing argument that the correct date is in fact May 21, 1888.

6. Corrington was an alias the senior Mannock took when he joined the British Army.


10. Ibid., p 32

11. Dudgeon, p 36.

12. Smith, p 47.

13. Ibid., p 53.


15. Eric Tompkins was stationed with the RFC at the Central Flying School in Netheravon and reunited with chance with Mannock in the Bedford Station Hotel Bar. Their brief discussion on flying definitely had a large impact on Mannock’s decision to transfer to the RFC. See Smith, pp 58-59.

16. A Scout pilot was an airman within the RFC/ RNAS/ RAF who flew a relatively fast single-seat aircraft, armed with one or more machine guns, with two primary purposes: 1) protect the slower two-seat reconnaissance, artillery spotters or bombing aircraft on their missions and 2) engage and defeat enemy aircraft. In the French Air Service these pilots were known as pilotes de chasse or chase pilots. The American Air Service used the identification of Pursuit pilot. During the interwar period the now more familiar and universal identification of “fighter pilot” would be established as the tactics and doctrine were formalized within each nation’s air service.

17. Jones, p 27. Mannock was referring to then Lieutenant (later Captain) Albert Ball, DSO and two bars, MC who during the summer and fall of 1916 received much publicity in the British press for his aerial exploits. Ball was credited with 44 victories (43 aircraft and 1 balloon) and would earn a posthumous Victoria Cross after his aircraft crashed during a dogfight with Jasta 11 near Amnoeulin on the evening of May 7, 1917. The German propaganda machine tried to convince the world that Lothar von Richthofen had shot down the great British air hero. In fact the younger von Richthofen was shot down by Ball only minutes before Ball himself crashed. It is believed that Ball entered low storm clouds, his engine stopped and when he finally cleared the cloud his aircraft was inverted. Having no time to right his SE 5, he crashed into the ground and died of his injuries. Ball was just 20 years old. See Norman Franks Who Downed the Aces in WWI? (London: Grub Street, 1996), pp 32-34.


19. McCudden scored fifty-seven victories and would be ranked as the fourth highest British Ace of the war. Notable achievements include his receiving the Victoria Cross, the Distinguished Service Order and Bar and a Bar to his Military Cross on April 6, 1918 from King George V for his achievements while fighting in France. He was killed in a flying accident on July 9, 1918 while enroute to take command of Number 60 Squadron. See Bruce Robertson’s Air Aces of the 1914-1918 War, (Fullbell, Calif: Aero Publishers, Inc., 1959) and Alex Revell’s Victoria Cross: WWI Airmen and Their Aircraft, (Stratford, Conn:Flying Machine Press, 1997) for more on McCudden.


25. Dudgeon, pp 84-85, Smith, pp 77-78.


27. Smith, pp 98.


29. Dudgeon p 121.

30. Dudgeon, p 185-66

31. Smith, p 115.

32. Dudgeon, p 127


34. Smith, p 123.

35. Dudgeon, p 159.

36. Ibid., p 160.


38. Dudgeon, p 162.

39. Ibid., p 166.


41. Ibid.

42. Smith, p 128.

43. Dudgeon, p 174.

44. Douglass Wheton, Mannock, Patrol Leader Supreme (Falls Church, Va: AJAY Enterprises, 1977.)


47. Dudgeon, p 176.

48. Revell, p 51.

49. “The total number of machines definitely accounted for by Major Mannock up to the date of his death in France (26th July, 1918) is 50 - the total specified in the Gazette of 3rd Aug., 1918, was incorrectly given as 48 instead of 41.” VC citation, London Gazette, 18 July 1919

50. Jones, p viii.

51. Dudgeon, pp 189-200.

52. Christopher Shores, Norman Franks, & Russell Guest, Above The Trenches: A Complete Record of the Fighter Aces and Units of the British Empire Air Forces, 1915-1920, (London: Grub Street, 1990), p 256. The breakdown of Mannock’s confirmed victories: 1 balloon, 3 aircraft captured and 2 shared captured, 30 aircraft destroyed and 3 aircraft shared destroyed, 17 aircraft out of control and 3 shared out of control=61.


54. Ibid., p 182.

On the brink of World War II, Texas offered the Army Air Forces an abundance of ideal locations to build air bases. After the Japanese attack on Pearl Harbor in December 1941, a maddening pace of air base construction began that would eventually result in sixty-five Army airfields within the borders of Texas—more than any other state. Such a large number of air bases and the men and women who manned them flooding into a largely rural and closed culture fundamentally changed Texas. Alexander explores these changes in The Wings of Change and the challenges both the Army and Texas communities had to face and overcome. The author is no stranger to the subject having written two previous books on Texas military history.

Alexander handles his subject by dividing the state into geographic areas and covering the cultural aspects of that region and the bases within it in a single chapter (for example East Texas is profiled in Chapter Two). The history of major air bases in a geographic region received prominent treatment. To illustrate the book, the author located photographs from county historical commission archives from the communities where the air bases resided and in some cases took his own photographs of the ruins of long abandoned airfields.

While this is an interesting book, the author does not explore the cultural changes in any depth, but concentrates instead on offering common knowledge air base histories.

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Several of America’s military conflicts vie for the moniker, “The Forgotten War.” The Kosovo conflict of 1999 is a contender for that title; it deserves better. While it did not have the drama of sweeping armor attacks or, more importantly in our media-saturated age, the focus of celebrity anchormen and imbedded journalists, it did provoke important innovations in waging modern war. Although it now seems very long ago, in the years immediately prior to September 11 some of America’s most extensive overseas air operations occurred in the Balkans—first in Bosnia and later, in Kosovo. In both regions Muslim populations faced annihilation; and the United States, working in conjunction with the United Nation and, later, NATO, led interventions that ultimately stemmed the violence. As General Clark makes clear in his first book, Waging Modern War, these events offer instruction for how a superpower might employ air power in the new century. The author’s qualifications are without question. Clark was the central player in these events and his behind-the-scenes account is complex, but he enlivens the story with touches that firsthand knowledge can provide. Of particular interest to readers of Air Power History is how air power was employed in new or innovative ways.

Operation Allied Force in Kosovo was a NATO operation (its first), not one under the umbrella of the United Nations. As Clark explains, the original plan was to give Supreme Allied Command Europe (SACEUR) authority to strike at targets established by NATO, but Washington trespassed on that authority by imposing target-by-target approval. The U.S. dominated the planning for air operations inasmuch as roughly 99 percent of the proposed targets came from U.S. intelligence. Clark’s dilemma was thus compounded, not only by the complex process of assauging nervous allies, but also by having to obtain target clearance six time zones away. The intent was that air strikes should be coercive, following the standard doctrine of first achieving air superiority. This was diluted by the skittishness of NATO allies over the use of air power and, later, by reservations in Washington over Clark’s desire to use Apaches and ground forces. To some in Washington, Clark’s request for the Apaches heedlessly imperiled a precious part of the defense budget and increased the risk of ground operations. Advocates of conventional air power also argued against their use.

Despite all of the hand-wringing over targeting, numerous controversies arose. The operation faced criticism from many quarters over what constituted a military target, and civilian casualties reinforced Serb support for the Milosevic regime. Furthermore, the NATO bombing campaign destroyed infrastructure in areas not immediately crucial to Serbia’s war effort in Kosovo (e.g., Northern Serbia or Vojvodina) but absolutely critical to post-war Serbia’s efforts to move beyond the Milosevic years. Clark could have said more about the bombing of the Chinese embassy in Belgrade on the night of May 8, 1999. He offers a plausible, if conventional, explanation for that strike, but does not venture into its wider consequences and, most importantly, the ongoing mystery over how such a colossal intelligence blunder could have occurred—if indeed that’s what it was.

According to Clark, a chief reason for the ultimate success of the operation was its essential legitimacy. The war proceeded—with frequent nods to alliance politics and consensus-building—in ways which reinforced its legitimacy and ultimately aided in postwar reconstruction. Since the end of the fighting, the United Nations (with support from NATO, the European Union, and the United States) has engaged in creating state institutions and turning them over to the people of Kosovo. The early involvement of the UN undermined the notion that this was some sort of imperial venture. To Clark, the lesson of the Balkans is that multilateralism, consensus, and containment ultimately worked. Waging Modern War warrants inclusion in the collection of anyone interested in the Balkans, the development of new approaches to modern warfare, or the use of air power in a politically sensitive context. Yet, even those who closely followed the events of NATO’s bombing campaign in Kosovo may find his account daunting. Clark deserves praise for making a substantive contribution to the scholarship on the Kosovo operation, but non-specialist readers might want to read selectively.

Clark’s latest book, Winning Modern War, is something altogether different. In this more general account, Clark is no longer writing as a participant but as a knowledgeable observer. In many ways, this account is well served by such distance, if only because the author doesn’t feel the need to offer the reader so many details. He demonstrates powerful analytical abilities and makes good use of his many sources at the Pentagon and within the services, using these connections to weave a lucid critique of the Iraq operation. Clark sees the military operations in Iraq—particularly the air components—as particularly praiseworthy. He brings to this account an understanding of how post-conflict operations and sturdy alliances can aid in establishing legitimacy. According to Clark, although the ser-

Tom Crouch, Senior Curator of the Division of Aeronautics at the National Air and Space Museum, is the author of the highly acclaimed biography of the Wright brothers, The Bishop's Boys: A Life of Wilbur and Orville Wright. This handbook serves two purposes: it is a condensed version of Crouch's earlier work that focuses on the development of the airplane, and it is guide to national parks and other sites that commemorate the Wright brothers’ story. New material not contained in The Bishop's Boys provides additional context to the Wright brothers’ story.

Wilbur and Orville recognized their true calling as engineers and experimenters at an early age. By the early 1890s, as Crouch observes, “ten years before their serious involvement with the airplane, the Wright brothers were already demonstrating their extraordinary ability to imagine a complex machine and envision how such a machine might function.”

Their interest in aviation was sparked in the mid-1890s by the glider flights of Germany’s Otto Lilienthal and became a serious endeavor in 1899. They began their investigation into the science of aviation in methodical fashion by studying the work of others and then breaking the problem of flight into its component parts. They realized that flight would require three things: lift to carry the aircraft and its load, power to move the aircraft at sufficient speed, and a means of control. And they knew that control would be the most difficult problem to solve.

From this foundation, the story of the first successful flight is one of steady progress fueled by the Wright’s’ skill as designers, builders, and testers. Each year from 1900 to 1902 they spent one or two months at Kitty Hawk, North Carolina, testing progressively more advanced gliders. They designed each successive aircraft based on established data, tested it to determine how it performed (or why it didn’t perform as expected), and then redesigned and built anew. By 1902, they had built a wing with sufficient lift, had developed innovative “wing warping” to deal with roll control and — after testing numerous rudder and elevator configurations — had found an adequate means of controlling pitch and yaw.

The remaining task was to develop a suitable power plant. Unable to find a manufacturer who could build an engine to their specifications, the Wrights designed their own engine and had it built in their Dayton bicycle shop. It all came together at Kitty Hawk on December 17, 1903, when Orville made history by piloting the Flyer I in the first controlled, sustained flight, traveling 120 feet in 12 seconds. The four flights they made that day added up to a little over one-quarter mile.

The Wrights had flown but could not keep the Flyer in the air for very long. They knew they had a lot of work to do to truly solve the problem of control. For the next two years they did all their flying close to home in Dayton in a large pasture known as Huffman Prairie. The breakthrough came when they redesigned the forward-mounted elevator by increasing its area and moving it further forward of the wing. The control problems disappeared, and by October 1905 the Wrights were logging flights of over 30 minutes duration. The world now had the first practical airplane.

For the rest of the Wrights’ story, Crouch describes their dealings to sell airplanes to U.S. and foreign governments, the court battles over patent infringement, the business ventures, and the decades-long refusal of the Smithsonian Institution to recognize the Wrights as the inventors of the first machine capable of manned, sustained, heavier-than-air flight.

The book succeeds, both as a description of how the airplane was invented and
as a guide to sites honoring the Wrights. It is exceptionally readable and is enhanced by photos, maps, and illustrations on almost every page. It would be a small but valued addition to the library of any aviation enthusiast.

Joseph Romito, Visitor Services Specialist, National Air and Space Museum Udvar-Hazy Center


In this lengthy volume, Duncan argues that no institution has been affected more by the events of September 11, 2001, than have the armed forces have. Focused on fighting wars abroad, the military suddenly had no choice but to be worried about homeland security. Given this new and evolving context, Duncan’s objective is to provide readers with a “snapshot in time,” through an examination of the impact of the new war on terrorism upon the military and the role of force in homeland security. He thus divided his book into ten chapters, each capturing an issue of importance to the current and future shaping of the military force for homeland security.

The first chapter discusses the events of 9/11 and how the military responded. It is followed by a review of how military force was historically used in response to terrorist acts. Duncan is particularly critical of the Clinton administration and its lack of attention to terrorism as a national security issue rather than a criminal matter (because of insufficient political will and courage). Chapter 3 discusses development of a counterterrorism strategy, and its focus on preemption, by the Bush administration. Chapter 4 brings to the fore actions taken at home to better defend the homeland, such as creation of a new U.S. Northern Command and steps that eventually led to establishment of a Department of Homeland Security. Chapter 5 examines the bureaucratic problems encountered along the way — such as overlapping jurisdictions. Chapter 6 discusses *Posse Comitatus* and military force. Duncan argues that the question of legal authority related to the use of military force in case of a terrorist attack is settled. The President has the proper constitutional authority to do so, and this is reflected in the *National Strategy for Homeland Security*. Chapter 7 analyzes the role of reservists in the war on terrorism and recognizes that a balance is needed between what is required to meet military objectives and the burden on reservists. Chapter 8 is about due process and the laws of war and reviews the debates and legal opinions on the definition and handling of enemy combatants. Chapter 9 discusses the events that led to the latest war in Iraq, while Chapter 10 looks at the debates between civilian and military leaders on transformation of military force and its future.

Duncan concludes that “in this new and different kind of war, the traditional line between military and civilian functions is, like the line between foreign and domestic threats, becoming less distinguishable, not because of our preferences, but because of the very nature of war. The balance between the DoD mission of forward defense and its responsibility to provide critical support at home before and after a terrorism-caused crisis must, therefore, be recalibrated.”

Given Duncan’s impeccable credentials —forty years of active and reserve naval service—and assistant secretary of defense in two administrations, I find it surprising that he made little effort at going beyond the surface to enrich the post-9/11 story of America’s armed forces. I expected a more in-depth look at the internecine debates that rattled the Bush administration and a more extensive use of government documents, including those he could have acquired through the Freedom of Information Act. When everything is said and done, Duncan’s storytelling is adequate and competent but too underspecified to be a definite or authoritative account that would stand the test of time. As such, I would only recommend this book to those in need of a well-written snapshot of all the issues surrounding the use of military force post-9/11.

Mr. Stéphane Lefebure, former civilian strategic analyst and army intelligence officer, Department of National Defence, Canada


Canada, the country with which the U.S. shares its longest border, is often viewed as not pulling its weight in defense of North America and the western world. Unfortunately—at least to this Canadian—this has indeed increasingly been the case over the last couple of decades. By the same token, even if Canada does not do as much as some would wish, it does considerably more than many of its more extreme critics realize. These two books take quite different looks at this situation. The first details some recent Canadian military activities; the second goes some way to explaining developments during a key period of Canada-U.S. relations.

Dr. Gimblett, a retired Canadian naval officer currently working as a naval historian and defense analyst, has produced a clear, succinct, and attractive summary of one very significant Canadian contribution to crucial military operations against Al Qaeda. *Operation Apollo* should be read by anyone who thinks that Canada has played no role in this critical struggle, as well as by those who think it should do nothing.

This beautiful volume provides an excellent account of the many ways in which the Canadian Armed Forces (or CF) have helped in crucial military operations in southwest Asia. Continually accomplishing more with less, the remarkable men and women of the CF have engaged in—and indeed even led—naval and maritime air patrols in the Persian Gulf and logistical support there by both air and sea.

Gimblett does not deal with the few thousand Canadian Army personnel who have served in Afghanistan, concentrating instead on his beloved sailors (as well as the airmen with whom they worked) in another, nearby theater of the same war. It is ironic that the CF has actually done more as part of the “War on Terrorism” than many of the “Coalition of the Willing,” notwithstanding former Prime Minister Chrétien’s much-publicized eschewing of any role in the Iraq theater of this conflict. Gimblett served in the first Gulf War, appreciates the strategic significance of the region, and understands the complicated intricacies of operations undertaken there following 9/11. He appreciates, for example, what the air force brought to the operation. In 530 days
of flying as part of Op Apollo, CF Aurora long-range patrol aircraft flew 507 missions, for a total of 4,375 hours and a greater than 98 percent mission completion record. Even the CF’s much-maligned old Sikorsky Sea King helicopters earned praise for their work flying off Canadian ships in the Gulf, flying 6,463 hours (far in excess of the normal yearly flying rate) at an impressive 95 percent availability. Throughout the deployment, CF aircraft provided strategic lift into theatre and tactical lift within the region, including into Kabul.

Gimblett does a good job of showing how a relatively small contribution from a nation that begrudges every defense dollar expended, once again gave Canadians who care the opportunity to talk about punching above their weight.

Finally, this slim tome is a great bargain; it even includes informative DVD documenting CF operations in the Persian Gulf. It is profusely illustrated, not only with color photographs but also with reproductions of war art painted in-theatre by marine artist John Horton. It deserves a place on your bookshelf, but you owe it to yourself to read it first.

Anyone who wonders how Canadian-American relations reached the point at which we find them today would do well to read the book by Greg Donaghy, a staff historian with the Department of Foreign Affairs and International Trade in Ottawa. While the story of Can-Am relations is as long and convoluted as the history of the two nations, the period upon which Donaghy concentrates is key to any understanding of how we got here. The late 1960s saw immense developments that brought the North American neighbors increasingly closer in a number of areas. While everything is connected in some way and nothing happens in a vacuum, readers may wish to skim or even skip the chapters on such topics as the intricate negotiations surrounding the Autopact, the Kennedy Round, and financial relations, and carefully consider Chapter Four, “Defending the Deterrent”—although I found them all extremely enlightening.

While working on his book, Donaghy could probably not have imagined the degree to which his prodigious research would result in a monograph of such contemporary relevance. The parallels between Vietnam—with the U.S. under President Lyndon B. Johnson, and between Vietnam—with the U.S. under temporary relevance. The parallels would result in a monograph of such con-
sound barrier (a most significant psychological breakthrough), variable sweep wings, the ill-fated supersonic transport (SST), and the shift from aeronautics to space research. But aeronautics still had plenty of problems to solve: skin friction, controlling boundary layer conditions, harmonic oscillation or wing flutter, and wind shear to mention only a few. In short, there is no ceiling, no limit on aerodynamic progress. The scope of human ingenuity here is endless.

I strongly recommend this book as a concise education on the aerodynamic factors which control the progress of aviation.

I.B. Holley Jr., Emeritus Professor of History, Duke University


Air Power History readers are usually anxious to read books on the great fighter aces. Some will praise this book; others will have second thoughts. Neither its excellent writing nor its historical facts will generate controversy; the method of presentation, however, may. This is Brassey's first volume in a new series of biographical works taking a very different approach—constructing personal discussions with the subject from his letters, diaries, and other writings. Kilduff uses a series of "interviews" by a fictitious war correspondent as his novel approach. This may appear to border on historical fiction; but, if done carefully with craftsmanship and scholarship, it might produce a better picture of the subject. Having published seven previous books on Manfred von Richthofen (the Red Baron), Kilduff is probably the world's leading expert on Germany's top World War I ace. As the only non-German to be granted full access to the von Richthofen family papers, the depth of his knowledge is clearly evident.

Kilduff restricts the book to the Red Baron's final year in combat and very well balances coverage of both aerial operations and his subject's character. Readers are fascinated by both, and both must be examined to place an ace in perspective. In his operational examination, Kilduff also shows that tactics not only vary with time and place but also with the inherent advantages of one aircraft type over another. He provides this excellent balance of coverage while maintaining reader interest. It was a pleasure to find a new book on a great fighter ace which does this.

But the problem with the author's methodology remains. This book may well allow the non-historian to learn much about the Red Baron. On the other hand, serious student of World War I and of early aviation may well feel uncomfortable. One experienced historian called this "a non-citable source." Thus, while the lack of footnotes or other tracking methods may make the non-specialist more comfortable, it also leaves the specialized student wary about the quotes used. Only Kilduff's sterling reputation from his earlier published works on von Richthofen and his excellent writing provide confidence.

While I am not in favor of using this approach in additional biographies, I still found the book both fascinating and thought provoking. In one example, von Richthofen claims French aviators are cowards who flinch and dive away from combat. A careful analysis of the eighty proven von Richthofen victories and three unconfirmed claims reveals only one possible combat against someone other than a British Commonwealth foe. The comment accurately reflects his views, but is based on the prejudices of his class rather than his own combat experiences. Items of this sort make Kilduff's book an enjoyable study and paint a rich picture not only of the Red Baron, but also of his colleagues and surroundings.

Comments by von Richthofen's comrades further enrich this book. Kilduff mined the letters of other members of von Richthofen's units to construct side interviews with these historical personages which help flesh out the atmosphere present among the German aviators of 1917-18. Most of these discussions seem fairly natural and include the attitudes and phrases which often mark discussions among fighter pilots. But many of these discussions sound a bit artificial to the modern ear, primarily because German society in World War I was more impressed by nobility than a modern reader may imagine. In one chapter there seemed to be too much emphasis on court politics and personalities, but again that is probably typical of the era.

One strength of Kilduff's approach is that von Richthofen emerges as an inconsistent and contradictory person. His statements on tactics vary from the very primitive in one chapter to carefully thought out, modern, and strategic in a later chapter. The "war correspondent" states that many persons see the Red Baron as an enigma, thus alerting the reader to ponder why. At first, this may bother some readers, but what one finds in von Richthofen's statements are the development of the young officer maturing his views and tactics as experience broadens him. Kilduff might have lectured the reader on this, but wisely let his readers ponder the inconsistencies and growth that marked the Red Baron's final year in combat. Clearly the book's message must be absorbed; but having done so, I concluded the effort was enjoyable.

Col. H. Larry Elman, USAF (Ret.), Margate, Florida


This booklet on the 1st Aero Squadron in 1916 is a concise and well documented account of the first real use of American military aviation. Following Pancho Villa's March 1916 attack on Columbus, New Mexico, the U.S. government assembled an expeditionary force under Gen. John J. "Blackjack" Pershing to enter Mexico and pursue Villa and his army of bandits. Miller makes it clear that aircraft were included in the original plan for the expedition, and their use was directed by the highest levels of the government. In spite of this high level of support, a common theme throughout the narrative, is the poor state of U.S. military aviation just prior to World War I.

Miller begins by reviewing the 1st Aero Squadron's activities from its formation until the squadron's mobilization for action in March 1916. He gives a brief overall background of the punitive expedition and then continues to explain in great detail the squadron's activities during the expedition, using many original sources as references.

The author's description of the first mission into Mexico is particularly revealing. When Capt. Benjamin D. "Benny" Foulois, commander of the squadron, receives word from General Pershing to join him in Mexico, Foulois immediately orders his squadron into the air despite the late hour and the fact that none of his pilots had any night flying experience. Predictably, everyone gets lost and it takes days to reassemble the squadron. This was just as well because the ground officers set up the landing beacon under a group of trees and if they had found the
marked spot all the aircraft might have been destroyed! As the title postulates, the punitive expedition was “a preliminary to war” in that it highlighted problems the airmen would face in France a year later and the sad state of the American aviation industry. Although there were many problems, the greatest limitation was the poor quality and limited performance of the aircraft. For example, when called on to scout the railroad leading south into Mexico, the pilots found it impossible to climb high enough to clear the mountains in their path. The infant Air Service also discovered during this early period how important it is to supervise manufacturers and suppliers at the source. Foulois’ very competent aircraft mechanics spent many hours correcting manufacturing defects that should have been fixed at the Curtiss factory.

By the end of the book the reader gets a good sense of the insurmountable problems faced by the founders of American military aviation and how these experiences shaped their future beliefs and began to form Air Force doctrine. Miller’s book contains timeless lessons for all who serve and support the Air Force today. Profusely illustrated with original photographs and extensive documentation, this small book is well worth reading.

Lt. Col. Mark A. Johnson, USAF (Ret.), National Air & Space Museum Docent


Air Power History readers will welcome this full-life biography of the first Secretary of the Air Force who spent much of his career battling for the service. Although reared in a family under strained circumstances, he had well-to-do relatives who saw to it that he got a Yale education. At Yale, he was popular and made many friends who were useful to him in later life. During his college years he met the charming and beautiful daughter of Senator James Wadsworth, a powerful Republican from upstate New York. Although Symington came from a long line of Democrats, Wadsworth took an instant liking to this handsome young man. Without waiting to finish his senior year at Yale, Symington persuaded one of his relatives to give him a job as a factory hand so he could make some money and marry Eve Wadsworth.

Again through relatives, Symington was offered a position in an appliance firm in Rochester making parts for radios. Contacts from Sears helped the firm prosper. When he sold his interest in the business some years later, he became a millionaire. Through the good offices of future Secretary of Defense James Forrestal, Symington was offered the presidency of Emerson Electric Manufacturing Co. of St. Louis. With war coming, Emerson began producing artillery components and later built aircraft gun turrets. When Army inspectors made false charges about Emerson’s business practices, Symington met with Senator Harry Truman who, convinced the charges were false, shielded Emerson from further trouble. This meeting led to a friendship with Truman which was to launch Symington on his subsequent bureaucratic and political career.

After the war, President Truman asked Symington to take on a difficult assignment as the chair of the Surplus Property Board, an activity which after World War I had led to scandals and was again heading in that direction. Symington’s efficiency and integrity in administering this political hot potato, and his skill in dealing with Congressional critics, led Truman to appoint him Assistant Secretary of War for Air, where he played a successful role in the postwar effort to unify the armed services. This led Truman to select him as the first Secretary of the newly formed independent Air Force. During his watch he pushed racial integration in the USAF and became a vigorous advocate of the 70-group plan as an essential strength in confronting the Soviet threat. The vigor of his advocacy soon began to unravel his friendship with Secretary of Defense Forrestal over their differing views of the budget. He also pushed all-out in seeking funding for the B-36 bomber against stiff Navy opposition.

When Symington stepped down as Secretary, he may have thought he was about to return to the business world. But Truman had other ideas, selecting him to chair the reorganized National Security Resources Board, where once again he sailed through the bipartisan confirmation process. Clearly, his great personal charm and wide circle of prominent friends played to his advantage. Not surprisingly, political leaders in Missouri began to consider him as a prime candidate for the U.S. Senate. He won in a landslide.

As Symington entered the Senate in 1952, his network of friends throughout government—Lyndon Johnson, Hubert Humphrey, Clark Clifford, Eugene Zuckert, Edward Teller, Gen Carl Spaatz, Anna Rosenberg, and Gen George Marshall among them—was a powerful asset. Johnson immediately put the freshman on the prestigious Armed Services Committee, where he served throughout his long Senate career. But Symington’s outspoken advocacy of greater USAF appropriations brought him into direct conflict with his longtime friend, President Dwight D. Eisenhower, who was struggling to hold down defense appropriations to balance the budget. Many admirers urged Symington to run for the presidency in 1960, and he made a half-hearted effort but gave way gracefully when Senator John F. Kennedy won the nomination. Symington continued his advocacy of Air Force interests, but when the nation became mired in the Vietnam conflict, he gradually became decidedly dovish.

Symington ended his career in the Senate in a sustained search for peace via arms control treaties and limitations on nuclear weapons. What made Symington so effective were his personal charm, good looks, integrity, impressive and diverse list of influential friends, personal fortune, and attractive wife. When he stepped down in 1976, he could look back over a career of great service to the nation with real satisfaction.

This excellent biography fills a long felt need. It is scholarly and massively documented, yet still eminently readable.

Professor I. B. Holley, Jr. Duke University


There is a fascination with long distance operations. Xenophon’s “Anabasis” is a best-seller, and Hannibal’s crossing the Alps attracts attention, even without the elephants as a side-show. In California, Kearny arrived from Leavenworth to fight the Battles of San Pascual and San Gabriel and secured the Treaty of Cahuenga well before Guadalupe Hidalgo. At the same time, Fremont followed the Mission Trail, El Camino Real, in reverse from Sonoma to San Diego. Kearny died
soon afterwards, but the commander of the California Battalion is significant in state, national, and Republican Party history.

Long-distance fliers today fly at 30,000 feet with the only hardship being barely edible airline food and the only delay the security check. Even those who approximate the land routes have internal combustion engines, super highways, McDonalds for sustenance, and Motel 6 for rest. Though the general topography and climate haven’t changed, it is difficult to imagine and recreate the conditions experienced by Pica Secas ( pikemen) on el Camino Espanol.

It is claimed that the first edition of this work in 1972 was the birth of “new military history,” emphasizing organization, mobilization, pay, supply, morale, and above all, logistics, rather than battles and sieges. Parker covers one of the great logistical feats of early modern Europe—how Hapsburg Spain mobilized and maintained the largest army in Europe for eighty years to suppress the Dutch Revolt 700 miles away and —in the end, failed.

American textbooks, in their coverage of this period, tend to downplay or overlook the connection between events described here and U.S. history. The particular Spanish Armada we read about most—the one in 1588—was an effort to open the sea corridor to the Low Countries. Our Pilgrim forefathers sought refuge in the Netherlands before sailing on the Mayflower. New Amsterdam was founded in 1624. Throughout the 80 years, there was an ebb and flow of volunteers from England, Ireland, and Scotland—depending on shifting alliances and political conditions at home.

Despite some effort to emphasize logistics rather than fighting and weaponry, the latter are not ignored. There’s an excellent introduction covering the character of Low Countries’ wars which is well worth reading by itself. However, though a graduate of schools at both Forts Belvoir and Sill, I could have used a better illustration of the fields of fire of the artillery fortresses discussed. The chapter on “The High Command” is mostly about financial controls and attempts to justify Spain’s involvement in the Netherlands. Initially there had been an attempt to make the provinces pay for themselves. They were not much smaller, but much richer, than England. Ravaged by rebellion, they were hard to exploit and didn’t yield much. Holding on for so long was a matter of pride plus religious fervor. I grew up with Motley’s “History of the Dutch Republic” at home, but this work gives the Spanish point of view.

Though this covers a seldom-told aspect of a long struggle, it does fill a gap—less glamorous than cavalry charges, perhaps, but more important. Geoffrey Parker is Andreas Dorpalen Professor of History at Ohio State and a prolific and distinguished historian of early modern Europe. His book is a good read for anyone recognizing a gap for this period.


In Touched With Fire, former National Observer and Wall Street Journal writer James Perry has given us a look at five Presidents from the Gilded Age of American history—Ulysses S. Grant, James A. Garfield, Rutherford B. Hayes, Benjamin Harrison, and William McKinley. In particular, he has given us a look at the battles that raised them from relative obscurity to state and national prominence. By taking on this topic, Perry has provided a double service to the reader. First he has provided information about Presidents that the average American knows relatively little about. Most people know that Grant was the commander of the Army of the Potomac and that he accepted Lee’s surrender at Appomattox Court House. Most also know that McKinley was assassinated—leading to Theodore Roosevelt’s presidency—and that Benjamin Harrison was the grandson of William Henry Harrison, but poor Hayes and Garfield are usually left in the dark. Now the casual reader can at least get to know something about them.

The second service that Perry provides is his chronicling of Civil War battles that one hears of very little, if at all. Because these five future presidents came from western states, it made sense that their respective regiments would be assigned to either the Army of the Cumberland or the Army of the West. Forts Henry and Donelson, Chickamauga, the Big Sandy Campaign in Kentucky, and the West Virginia Campaign are looked at, with Perry giving an excellent insight into who fought, what their strengths and weaknesses were, and why a particular side was victorious. Inside the overall picture of the battles or campaigns, Perry gives a detailed look at the future presidents and how they fared. He takes care to show what they did right and, particularly in the case of Grant and Garfield, what they did wrong (Grant...
could never envision that the enemy could actually ruin his best laid plans, and Garfield was a conniver who wrote letters to government officials criticizing his superiors. Perry concludes the book with a look at the White House during the Gilded Age and rates each of the five Presidents. He notes that all five had to deal with veterans’ issues and that the Civil War would play a significant part in American politics until the death of McKinley.

Written in a conversational style that makes it easy to read, Touched With Fire is an excellent addition to the library of any Civil War or Presidential history enthusiast. If one can get by Perry’s repeated references to Confederates as “reb’s” and other examples of unscholarly writing, the book is rather enjoyable. If it has any weaknesses in its structure, it is its heavy weighting towards Harrison, Hayes, and Garfield to the detriment of both Grant and McKinley (the latter being the only one of the five who entered as enlisted, rising to the grade of major before war’s end). McKinley became a hero at Antietam by charging through enemy fire to bring his commissary waggons to starving Union troops, but aside from that he is generally ignored. Despite these flaws, Perry has done a commendable job, and the book is thoroughly enjoyable. It will definitely reward the reader.

M Sgt. Dennis Berger, USAF (Ret.), history teacher, Lubbock, Texas.


The author promises the reader much in the title of this work, and he delivers on that promise. Chris Pocock, a British aviation writer and consultant, is the author of Dragon Lady and other books and articles on the U-2 that have appeared in print over the past quarter century. While thus engaged, he collected declassified records and illustrations, and conducted interviews with all of the surviving principals at Lockheed Martin, the Central Intelligence Agency, and the United States Air Force. Today he is widely recognized as the U-2 authority by those who designed, built, maintained, and flew the airplane. (In the interest of full disclosure, I too furnished the author for this book illustrations and declassified records of early U.S. military overflights that took place before the U-2 came on line.) The result of his labor, 50 Years of the U-2, I think is as near a definitive history of the airplane and its operations as the reader is likely to encounter.

Composed of forty chapters arranged chronologically and topically and spread over 400 pages, this history covers the U-2 in detail from its inception in 1953-54 through its employment by the USAF in Operations Enduring Freedom and Iraqi Freedom in 2002-03. Along the way we are treated to an inside look at the early overflights of the Soviet Union and Communist China, those associated with the Cuban Missile Crisis and the war in South East Asia, the Black Cat Squadron operations conducted from Taiwan, the U-2 modified for use on board U.S. Navy aircraft carriers, USAF high altitude air sampling missions around Eurasia, and the U-2 in service of the National Aeronautics and Space Administration. The bureaucratic tensions over the U-2 that occurred between the CIA and the Air Force also are covered, if not always accurately, from the first flights through the National Reconnaissance Office (NRO) transfer of the CIA articles to the USAF that occurred in August 1974.

One is pleased to see the participants come alive in this history, often telling a part of the story in their own words, which makes the reading not only instructive but pleasurable. Accounts of their difficulties, disappointments, and lives lost in accidents and from enemy fire are not ignored. Interested in the technology? The reader will find throughout this volume informed descriptions of the airframe, engine, avionics, cockpit instruments, reconnaissance sensors, defensive suites and the changes in them that occurred as the U-2 moved from the A and B models through the U-2R and TR-1. Deployed around the world, the U-2 soldiers on today in its later versions—rivaling the storied DC-3 for its longevity and versatility. Pocock nonetheless acknowledges the ascendancy of unmanned aerial vehicles that have been employed so effectively in Afghanistan and Iraq, and suggest that the U-2 may have met its match in these machines, which can fly at lower altitudes without risking pilots, loiter for much longer periods and even launch ordnance over enemy territory.

No one produces a work of this length without errors. But those found here are mostly minor in nature. For example, MIT’s World War II Radiation Laboratory is confused with its post-war Lincoln Laboratory (p. 50), and the best resolution at the earth’s surface of the B camera at design altitude is given variously as two-and-one half feet (p. 25), four inches (p. 54 inset), and twenty-six inches (p. 199). James Baker, the camera designer, said it was six inches at nadir equipped with film of 100 lines per millimeter, which is what President Dwight Eisenhower confided using a photograph of an American naval air station in a television address to the nation on May 11, 1960. Pocock does not properly account for or explain accurately the role of the NRO in the U-2’s history during the 1960s and 1970s, but that is not surprising since that organization was not publicly acknowledge until 1992 and only a limited number of declassified records currently are available. Most perplexing, however, is the author’s warm embrace of Paul Lashmar’s discredited conspiracy theory: that the Strategic Air Command (read General Curtis LeMay) conducted overflights of “denied territory” in the 1950s without President Eisenhower’s knowledge. Even though there is hard documentary evidence to the contrary, Eisenhower, we are told in an example at page 46, “claimed he knew nothing about” the SAC overflights of Vladivostok that took place on December 11, 1956. A check of the accompanying footnote produced no reference to such a presidential claim whatsoever.

This big (8-1/2 x 11-inch), thick, beautiful case-bound book is printed on high quality, coated paper that displays its numerous color and black and white photographs to best effect. Its appendices are excellent, although its index is a disappointment. Its contents may prompt the CIA to revisit some of its declassification guides. Its printing, accomplished in China, surely prompted Chinese intelligence authorities to claim a portion of the first run. Yes, it is an expensive volume. But if you want to know this unique airplane and its history from alpha to omega, this is the only volume that you need on the bookshelf.

R. Cargill Hall, NRO Chief Historian (Retired)


Norman Polmar and Dana Bell have compiled what is—in their view—the 100
The most significant aircraft of the first century of military aviation. Anyone with even a passing knowledge of the history of military aviation could quarrel with their selections, but the aircraft they have chosen to describe do include some of the more important aircraft of the period, and all are presented in a single volume.

The principal shortcoming of the book is that the authors limited themselves to one hundred aircraft which is a clever but artificial limitation. Accordingly, they omitted some very important aircraft such as the TBM/TBF Avenger torpedo bomber of World War II that played such an important role in the Pacific after its introduction at the Battle of Midway. They also ignored the Curtiss SB2C Helldiver, which became the primary Navy dive bomber from 1944 to the end of the war. Another glaring omission is the Bell P–39 Airacobra. While the P–39 was not a primary participant for the U.S., it was a major contributor to the Soviet campaigns against the Wehrmacht and featured innovative design concepts, including a 37-mm gun that fired through the propeller hub. On the other hand, it is difficult to fathom why the book includes the Japanese Seiran which, while providing a fascinating tale, never flew a combat mission. The same can be said of the Westland Lysander, which was used principally as a transport for French partisans.

In the Cold War section, the authors included the Chance Vought F7U Cutlass, an aircraft the saw only limited U.S. Navy service, while ignoring the successor Chance Vought F8U Crusader, one of the most remarkable and effective supersonic fighters ever built. It was the first fighter to exceed 1,000 mph in level flight and was a major contributor to the air war over North Vietnam, being the premier MiG killer in the early stages of that conflict. They also included the Martin P6M Seamaster, a jet powered flying boat that never went into service. In the last section on new technologies, the inclusions and omissions are difficult to understand and include such minor aircraft as the British Aerospace Hawk (a trainer that hardly pushes the state of the art) and fail to mention really significant aircraft such as the F/A–18, F–16, A–6, H–46, and H–53.

All of the aircraft are described in an identical, easily read format that makes the book an ideal quick reference. Each entry contains a verbal description, a photograph, and a table of characteristics. The tables are the strong point of the book. Characteristics such as dimensions, armament, crew size, electronic subsystems (when applicable) and, in the case of bombers, useful bomb loads are included. An additional plus is the extensive and well organized bibliography which is divided into the countries that built and operated each aircraft.

Despite glaring omissions and doubtful inclusions, the manner of presentation, accuracy of the accounts, and ease of finding vital characteristics make this book beneficial to anyone interested in military aviation history.

Col. John Braddon, USMC (Ret.), Docent, NASM Udvar-Hazy Facility

Available at WWW.GPO.GOV

Prior to World War II, Paul Roxin was an air traffic communications officer for the then Civil Aeronautics Administration. During the war, he contributed to the war effort as an instructor for the War Training Service and Civilian Pilot Training Programs. In 1980, after an absence of about 25 years from aviation, Mr. Roxin became a board member and historian for the Rochester Pilots Association and is a co-founder of the Geriatric Pilots Association. The latter is an organization of World War II pilots living in the Rochester and upstate New York area.

One Foot on the Ground is a series of anecdotes collected from pilots in the Rochester area. Many of these anecdotes take place during the 1920 to 1950 time period and deal with the experiences of everyday flying. One will not find the how-I-won-the-war type of story here. Rather, these are stories that any pilot can relate to. Even in his introduction, Roxin talks about how he settled on the book’s title. In 1931, he was a grease monkey at the airport. “Back then, I also hawked plane rides to airport visitors—it was the only way I could get free flying lessons. It came as no surprise that some visitors had cold feet, telling us they’d be willing to go up as long as they could keep one foot on the ground. We had a pat response: ‘OK, we’ll put a box of sand in the plane for you.’ It usually worked.” Here is a sampling of other anecdotes:

A student pilot and his airplane versus a steamroller (guess who won that contest!)

How George Koenlein landed his Fleet Kinner on top of a tree (with neither pilot nor tree ending up hurt).

Stories about the experiences of Rochester’s World War II pilots—one was a Tuskegee airman; another flew gliders during the D-Day landings; and others flew their respective fighters and bombers, all relating their tales in accurate but modest ways.

The story of when Lindbergh came to Rochester.

Funny stories such as one about a flying clothesline.

Some World War II words of wisdom which read, “‘Tis better to have a WAC on your lap than a WAVE in your hair.”

And many stories about romance in the air, crashes, and close calls.

In short, there is something for everyone. Roxin knew his book would appeal mainly to people in the Rochester area, but he also thought the events recounted would have a universal appeal as well. He was right. The book is definitely fun to read. It is light and written in a very informal way. If you know a pilot who flew in the earlier years of aviation, buy him this book and you will bring a smile to his face.

Bill Nardo, Docent, National Air and Space Museum

Available at WWW.GPO.GOV

REMEMBERING KOREA: THE FORGOTTEN WAR

Edited by Richard P. Hallion

AIR FORCE History and Museums PROGRAM

Available at WWW.GPO.GOV


* Already under review.

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: scottwille@aol.com
Notice of Annual Meeting

All Members are invited to attend the AFHF’s Annual Meeting on April 18, 2006, scheduled to begin at 11:00 AM at the Club on Andrews AFB. RSVP required. Contact: Col. George Williams, USAF, (Ret.) Executive Director Command Drive-Suite 310 Andrews AFB, Md.
Mar 22-25
The Intelligence Studies Section of the International Studies Association (ISA) invites paper and panel proposals for the next ISA annual convention, to be held at the Town & Country Resort and Conference Center in San Diego, California. Contact:
Stephen Marrin
Woodrow Wilson Department of Politics
University of Virginia
e-mail: spm8p@virginia.edu or spm8p@yahoo.com
website: www.people.virginia.edu/~spm8p/
or http://iss.loyola.edu/call2006.html

Mar 25-28
The National Air & Space Museum will host its 18th Annual Mutual Concerns of Air and Space Museums Symposium at the Holiday Capitol Inn in Washington, DC. Contact:
Jean DeStefano
Office of Special Events
Smithsonian Institution
PO Box 37012
National Air and Space Museum
Independence Avenue at Sixth Street, SW
Washington, D.C. 20013-7012
(202) 633-2388
website: http://www.nasm.si.edu

Apr 3-6
The Space Foundation will host its 22d National Space Symposium at the Broadmoor Hotel in Colorado Springs, Colorado. Contact:
The Space Foundation
310 S. 14th Street
Colorado Springs, CO 80904
(719) 576-8000, Fax x8801
www.spacesymposium.org

Apr 6-8
The Cold War Studies Centre (CWSC) of the London School of Economics and Political Science, the Center for Cold War Studies (CCWS) of the University of California Santa Barbara, and the Cold War Group (GWCW) of the George Washington University, in cooperation with the History Faculty at Cambridge University will co-host their 2006 International Graduate Student Conference on the Cold War at CWSC and the British National Archives at Kew, on the edge of London, England. Contact:
Garret Martin and Louise Woodrofe
Cold War Studies Centre/International History Dept.
London School of Economics and Political Science
Houghton Street
London WC2A 2AE
e-mail: cwb@lse.ac.uk
website: http://www.lse.ac.uk/collections/CWSC/

Apr 19
The US Army Heritage and Education Center sponsors a public lecture series entitled “Perspectives in Military History; the lectures are presented monthly throughout the Army War College’s academic year. This month’s presentation, by Dr Carol Reardon, is “Not Just B-52s: Naval Attack Squadron 75 and the 1972 Linebacker Air Campaign.” The Center is co-located with the Army War College at Carlisle Barracks, Pennsylvania. For more information on the series, contact:
The Army Heritage and Education Center
950 Soldiers Drive
Carlisle PA 17013-5021
(717) 245-3971
e-mail: usamhi@carlisle.army.mil
website: http://www.carlisle.army.mil/usamhi/

Apr 19-22
The Organization of American Historians and the National Council on Public History will jointly hold their annual meetings in Washington, DC. This year’s theme is “Our America.” Contact:
Organization of American Historians
P.O. Box 5457
Bloomington IN 47408-5457
(812) 855-9851, Fax x9872
website: www.oah.org

May 5-7
The 9th Biennial Women in French conference, “French and Francophone Women and War,” will be held at Hinsley Hall in Leeds, England. Contact:
Alison Fell
DELC, Lancaster University
Lancaster, LA1 4YN United Kingdom
e-mail: a.s.fell@lancaster.ac.uk
www.h-net.org/announce/show.cgi?ID=145442

May 9-11
The American Helicopter Society will host its 62nd Annual Meeting and technology display at the Phoenix Civic Plaza in Phoenix, Arizona. Contact:
AHS International - The Vertical Flight Society
217 N. Washington Street
Alexandria, VA 22314-2520 USA
(703) 684-6777, Fax: 739-9279
e-mail: Staff@vtol.org

May 10-14
The Council on American’s Military Past will host its 40th annual meeting and historical conference at the Chattanooga Choo Choo Holiday Inn in Chattanooga, Tennessee. Contact:
CAMP
P. O. Box 1151
Ft. Myer VA 22021
(703) 912-6124
e-mail: camphart1@aol.com

May 17-20
The Hamburg Institute for Social Research will host “Crises in the Cold War,” its third in an annual conference series entitled “Between Total War and ‘Small Wars’: Studies in the Societal History of the Cold War”. Contact:
Dr. Christian Th. Mueller
Hamburger Institut fuer Sozialforschung
Mittelweg 36 · 20148 Hamburg Germany
e-mail: christian.mueller@his-online.de
www.h-net.org/announce/show.cgi?ID=145706
May 18-21
The Society for Military History will hold its 73rd annual meeting in Manhattan, Kansas. This year's theme is “The Construction, Reconstruction, and Consumption of Military History.” Contact:
Prof. Michael Ramsay
Dept. of History
Kansas State University
Eisenhower Hall
Manhattan KS 66506-1002
e-mail: mramsay@ksu.edu
www.ksu.edu/history/

Jun 1-4
The Journal of Policy History will host a Conference on Policy History at the University of Virginia in Charlottesville, Virginia. Contact:
Policy Conference
Journal of Policy History
Saint Louis University
P. O. Box 56907
St. Louis MO 63156-0907
e-mail: jpolhist@slu.edu
www.slu.edu/departments/jph

Jun 8-10
The Business History Conference will hold its annual meeting at the Munk Centre for International Studies at the University of Toronto in Toronto, Canada. This year's meeting theme is “Political Economy of Enterprise.” Contact:
Business History Conference
Hagley Museum and Library
P.O. Box 3630
Wilmington, DE 19807-0630
(302) 658-2400, Fax 655-3188
website: http://www.h-net.org/~business/bhcweb/

Jun 28-30
The Centre for European Conflict and Identity History will host an international conference entitled “War and Sexuality in 20th Century Europe.” The event will be held on the campus of the University of Southern Denmark, located in Esbjerg, Denmark. Contact:
CONIH – Centre for European Conflict and Identity History
Niels Bohrs Vej 9
DK-6700 Esbjerg
Denmark
e-mail: fj@adm.sdu.dk
website: http://websrv5.sdu.dk/conih/war.html

Jul 15-17
The University of Bristol's Group for War and Cultural Studies will host a conference entitled “War Without Limits: Spain, 1936-1939 and Beyond.” Its goal is to explore the international social, political, military, and cultural history of this conflict from 1936 to the present. Contact:
Dr Martin Hurcombe
Department of French
University of Bristol
19 Woodland Road
Bristol BS8 1TE
United Kingdom
e-mail: M.J.Hurcombe@bristol.ac.uk
/ www.bris.ac.uk/arts/birtha/centres/ war_withoutlimitsconference.html

Jul 25-27
The U.S. Army Center of Military History will host its biennial Conference of Military Historians in Washington, DC. This year's theme is “Terrorists, Partisans, and Guerillas: The U.S. Army and Irregular Warfare, 1775-2005.” Contact:
US Army Center of Military History
Attn: DAMH-FPP
103 Third Ave.
Fort McNair DC 20319-5058
e-mail: 2006CAH@hqda.army.mil
website: http://www.army.mil/cmh/

Jul 31-Aug 6
The Society of American Archivists will hold its annual meeting in Washington DC. Contact:
Society of American Archivists
527 S. Wells St.
5th Floor
Chicago, IL 60607
(312) 922-0140, Fax 347-1452
website: http://www.archivists.org

Aug 29-31
The Association for Unmanned Vehicle Systems International will host the “Unmanned Systems North America 2006” Symposium and Exhibition at the Gaylord Palms Resort and Convention Center in Orlando, Florida. Contact:
AUVSI
2700 S. Quincy Street, Ste. 400
Arlington, VA 22206
(703) 845-9671, Fax x9679
e-mail: info@ausvi.org
website: http://www.ausvi.org

Sep 19-21
The NASA History Division and the Department of Space History at the National Air & Space Museum will co-host a conference on “The Societal Impact of Space Exploration.” The meeting will be held in Washington, DC. Contact:
NASA History Division
Office of External Relations
Washington DC 20546
(202) 358-0384
e-mail: histinfo@hq.nasa.gov
website: http://history.nasa.gov

Nov 16-18
The French Ministry of Defense [Service Historique de la Defense (SHD)] is hosting a history conference in Paris, on “The Suez Crisis and the Western Powers.” Contact:
SHD
Relations Internationales
BP 166
00468 Armees – France
Tel.: 01.41.93.22.23

If you wish to have your event listed, contact:
George W. Cully
10505 Mercado Way
Montgomery Village, MD 20886-3910
e-mail: warty@comcast.net