# AIRPOWER

## MYTHS AND FACTS



**Col Phillip S. Meilinger**
**USAF, Retired**

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

# Report Documentation Page

*Form Approved*
*OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

| 1. REPORT DATE | 2. REPORT TYPE | 3. DATES COVERED |
|---|---|---|
| **MAR 1988** | **N/A** | **-** |

| 4. TITLE AND SUBTITLE | 5a. CONTRACT NUMBER |
|---|---|
| **Airpower: Myths and Facts** | 5b. GRANT NUMBER |
| | 5c. PROGRAM ELEMENT NUMBER |
| 6. AUTHOR(S) | 5d. PROJECT NUMBER |
| **Phillip S. Meilinger** | 5e. TASK NUMBER |
| | 5f. WORK UNIT NUMBER |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) | 8. PERFORMING ORGANIZATION REPORT NUMBER |
| **Air Univ, Maxwell AFB, AL** | |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | 10. SPONSOR/MONITOR'S ACRONYM(S) |
| | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) |

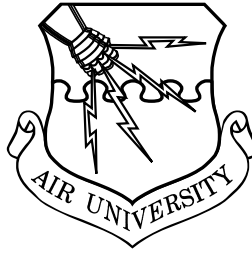
12. DISTRIBUTION/AVAILABILITY STATEMENT
**Approved for public release, distribution unlimited**

13. SUPPLEMENTARY NOTES
**ISBN 1-58566-124-4**

14. ABSTRACT

15. SUBJECT TERMS
**Air power; United States. Army Air Forces; United States. Air Force History; Bombing, Aerial; Precision bombing Effectiveness**

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | |
| **unclassified** | **unclassified** | **unclassified** | **SAR** | **140** | |




# Airpower

## Myths and Facts

PHILLIP S. MEILINGER
Colonel, USAF, Retired

Air University Press
Maxwell Air Force Base, Alabama

December 2003

Air University Library Cataloging Data

Meilinger, Phillip S., 1948–

Airpower : myths and facts / Phillip S. Meilinger.
p. ; cm.

Includes bibliographical references and index.

ISBN 1-58566-124-4

1. Air power. 2. United States. Army Air Forces. 3. United States. Air Force — History. 4. Bombing, Aerial. 5. Precision bombing — Effectiveness. I. Title.

358.4/009/04—dc22

**Disclaimer**

Opinions, conclusions, and recommendations expressed or implied within are solely those of the author and do not necessarily represent the views of Air University, the United States Air Force, the Department of Defense, or any other US government agency. Cleared for public release: distribution unlimited.

Air University Press
131 West Shumacher Avenue
Maxwell AFB AL 36112–6615
http://aupress.maxwell.af.mil

# *Contents*


| *Myth* | | *Page* |
|---|---|---|
| | DISCLAIMER . . . . . | *ii* |
| | ABOUT THE AUTHOR . . . . . | *ix* |
| | PREFACE . . . . . | *xiii* |
| 1 | Between the world wars, even though the US Army Air Corps received more than its fair share of funds from the Army, it continued to complain, agitate, and ask for more. . . . . | 1 |
| | Notes . . . . . | 13 |
| 2 | Entering World War II, the Air Corps's un-balanced doctrine and force structure leaned too heavily towards strategic bombing. Thus, air support of ground forces was inadequate and largely ignored by airmen. . . . . | 17 |
| | Notes . . . . . | 23 |

*Myth* *Page*

3 The Air Corps entered World War II with a "Douhetian" concept of air war that emphasized area bombing and the waging of war on women and children. . . . . 27
Notes . . . . . 29

4 Airmen thought they could win the war alone. . . . . 31
Notes . . . . . 36

5 The fact that German production, especially of aircraft, continued to increase throughout 1944 proves that the Combined Bomber Offensive (CBO) was ineffective and that the resources devoted to it would have been better spent elsewhere. . . . . 39
Notes . . . . . 45

6 Bombing was ineffective because it actually

*Myth* *Page*

stiffened rather than lowered enemy morale. . . . . 47
Notes . . . . . 50

7 The atomic bombs were unnecessary because Japan was about to surrender; even if it had not given up, an invasion or continued blockade would have been more humane. . . . . 53
Notes . . . . . 59

8 Overall, strategic bombing was a wasted effort that produced only minor effects. . . . . 63
Notes . . . . . 69

9 Airpower was a failure in Vietnam, losing the war and letting the Army down. Why even have an Air Force if it can't beat a fourth-rate power like North Vietnam?. . . . . 73
Notes . . . . . 81

| Myth | | Page |
|---|---|---|
| 10 | Strategic bombing failed in Vietnam because Rolling Thunder did not break the will of Ho Chi Minh and his cohorts to continue the war in the south. . . . . | 85 |
| | Notes . . . . . | 90 |
| 11 | Airpower was an indiscriminate weapon that killed excessive numbers of Vietnamese civilians. . . . . | 93 |
| | Notes . . . . . | 96 |
| 12 | Too focused on strategic attack during the Persian Gulf War, the Air Force provided inadequate support to ground forces. . . . . | 99 |
| | Notes . . . . . | 107 |
| 13 | Air attack is nothing more than "recreational bombing"; pilots fly so high they can't possibly hit their targets accurately. . . . . | 109 |
| | Notes . . . . . | 113 |

*Myth* *Page*

14 Despite all the talk by airmen, the employment of airpower remains an indiscriminate use of military force that deliberately targets civilians. . . . . 115
Notes . . . . . 121
INDEX . . . . . 125

## Illustrations

*Figure*

1 US Bomb Tonnage Dropped on Germany by Month . . . . . 33
2 Targets Struck by Category (Number and Percentage) in Operation Iraqi Freedom . . . . 104
3 US Airpower versus the World . . . . . 106

## Tables

1 Army and Air-Component Budgets, 1922–41 . . . . . 3

*Table* *Page*

2 Army and Navy Air Budgets, 1922–41 . . . . . 4

3 Army Officer Manning between the World Wars, Total and by Branch . . . . . 9

4 Key US Leaders during the Vietnam War . . . . . 76

5 USAF Combat Sorties in South Vietnam . . . . . 78

6 Persian Gulf War: Sorties Flown by US Service/Total, by Mission Type . . . . . 100

## *About the Author*



A 1970 graduate of the United States Air Force Academy, Col Phillip S. Meilinger, USAF, retired, received an MA from the University of Colorado and a PhD from the University of Michigan. After a tour at the Academy, Colonel Meilinger was assigned to the Air Staff's doctrine division in the Pentagon, where he wrote and edited numerous Air Force and joint-doctrine publications, worked roles-and-missions issues, and participated in the planning cell for Instant Thunder during the Gulf War of 1991. A command pilot who flew C-130s and HC-130s in both Europe and the Pacific, he has also worked as an operations officer in the Pacific Airlift Control Center at

Clark Air Base, Philippines. From 1992 to 1996, Colonel Meilinger served as dean of the School of Advanced Airpower Studies (SAAS) (now the School of Advanced Air and Space Studies [SAASS]), the Air Force's only graduate school for airpower strategists. After leaving SAAS, he served as a professor of strategy at the Naval War College.

His publications include *Hoyt S. Vandenberg: The Life of a General* (1989; reprint, Air Force History and Museums Program, 2000); *10 Propositions Regarding Air Power* (Washington, D.C.: Air Force History and Museums Program, 1995); *Airmen and Air Theory: A Review of the Sources* (Maxwell AFB, Ala.: Air University Press, 2001); and several dozen articles and reviews on airpower history and theory in journals such as *Foreign Policy, Armed Forces and Society, Armed Forces Journal International, Comparative Strategy, Journal of Military History,* and *Aerospace Power Journal.* He also edited and contributed to *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, Ala.: Air University Press, 1997).

After he retired, Colonel Meilinger became the deputy director of the AEROSPACENTER for Science Applications International Corporation in McLean, Virginia, where he may be reached by E-mail at meilingerp@saic.com.

# *Preface*

Airpower, especially strategic bombing, frequently generates controversy. Ever since the US Army bought its first "aeroplane" in 1909, debates have raged over the utility, effectiveness, efficiency, legality, and even the morality of airpower. These debates continue despite (or perhaps because of) the hundreds of books that have been written on the subject and the scores of examples witnessed. As the saying goes, certain topics tend to produce more heat than they do light. In some cases, the questions regarding airpower, strategic bombing, and their roles in war remain unanswerable—or at least people fail to agree on the answers. Soldiers, sailors, and airmen approach war from different viewpoints and with differing service-cultural perspectives, which similarly influence others who write and speak about war. This is natural and perhaps advantageous—fresh ideas are always useful. Unfortunately,

much of the debate regarding airpower and strategic bombing has been colored by accusations, misconceptions, inaccuracies, myths, and simple untruths. If airpower needs criticizing—and certainly there are times when criticism is appropriate—it must be based on accurate information.

The concept for this essay occurred to me as a result of questions asked or statements made to me over the years by students and faculty at the Naval War College, Army War College, Air University, and Britain's Joint Services Staff College. In addition, many scholars and military officers, both active duty and retired, have raised such issues in print, both here and abroad; so I decided to explore them in more depth. What follows are points and counterpoints that attempt to clear away some of the detritus that obscures the subject, thus allowing more informed debate on the real issues concerning airpower and strategic bombing. This in turn, hopefully, will give our political and military leaders a better

basis on which to form decisions in future conflicts.



Phillip S. Meilinger
Colonel, USAF, Retired

# Myth 1

> Between the world wars, even though the US Army Air Corps received more than its fair share of funds from the Army, it continued to complain, agitate, and ask for more.*

On average, the Air Corps received less than 12 percent of the Army's budget between 1919 and 1941, with a low of 4.5 percent in 1924 and a high of

*See, for example, Williamson Murray and Allan R. Millett, *A War to Be Won: Fighting the Second World War* (Cambridge, Mass.: Belknap Press of Harvard University Press, 2000), 32–33; James P. Tate, *The Army and Its Air Corps: Army Policy toward Aviation, 1919–1941* (Maxwell AFB, Ala.: Air University Press, 1998), 98; Allan R. Millett and Peter Maslowski, *For the Common Defense: A Military History of the United States of America* (New York: Free Press, 1984), 383; Edgar F. Raines Jr., *Eyes of Artillery: The Origins of Modern U.S. Army Aviation in World War II* (Washington, D.C.: Center of Military History, United States Army, 2000), 14–29; and Lt Gen William O. Odom, *After the Trenches: The Transformation of U.S. Army Doctrine, 1918–1939* (College Station, Tex.: Texas A&M University Press, 1999), 102, 110, 159–63. According to Odom, the Air Corps "thrived" between the wars.

16.8 percent in 1939 (table 1). Another source notes, however, that the Air Corps also received funds for base construction, ordnance, radios, medical supplies, and so forth. When one includes these "indirect appropriations," between 1920 and 1934, the Air Corps received on average 18.2 percent of the Army budget.[1] One should note that this is the Army budget, not the US defense budget, which also included funds for the Navy and Marine Corps. The Navy, incidentally, was even more niggardly towards its air arm. Combining the budgets for both the Army and Navy, one finds that the total amount spent on aviation in the two services averaged a mere 8.04 percent of the US defense budget between 1922 and 1941 (table 2).

To determine how the Army hierarchy viewed airpower, one need only examine an incident that occurred in 1932. At the Geneva Disarmament Conference that year, delegates advanced a number of proposals regarding arms limitations. Nonetheless, Jay Pierrepont Moffat, an American delegate, was stunned when

**Table 1**
**Army and Air-Component Budgets, 1922–41**
**(in millions of dollars)**

| *Year* | *Army* | *Air* | *Air % of Army* | *Year* | *Army* | *Air* | *Air % of Army* |
|---|---|---|---|---|---|---|---|
| **1922** | $322.7 | $23.1 | 7.2 | **1932** | $344.6 | $33.0 | 9.6 |
| **1923** | 277.1 | 8.1 | 6.5 | **1933** | 298.4 | 21.9 | 7.3 |
| **1924** | 246.1 | 11.0 | 4.5 | **1934** | 269.2 | 17.4 | 6.5 |
| **1925** | 251.9 | 11.7 | 4.6 | **1935** | 365.9 | 20.3 | 5.5 |
| **1926** | 267.3 | 14.9 | 5.6 | **1936** | 340.8 | 32.0 | 9.4 |
| **1927** | 265.6 | 16.8 | 6.3 | **1937** | 381.5 | 41.1 | 10.8 |
| **1928** | 292.7 | 19.4 | 6.6 | **1938** | 432.5 | 50.9 | 11.8 |
| **1929** | 315.4 | 23.3 | 7.4 | **1939** | 496.1 | 83.2 | 16.8 |
| **1930** | 328.7 | 28.1 | 8.5 | **1940** | 668.6 | 108.2 | 16.2 |
| **1931** | 345.3 | 38.7 | 11.2 | **1941** | 3,769.6 | 605.4 | 16.1 |

**Average Army Budget=$514** **Average Air Budget=$60.9** **Average Air %=11.9**

Note: "Army Budget" is the "Total Military Establishment Expenditures" portion of the "Total War Department Expenditures"—"Civil Expenditures" make up the difference. "Air Budget" is the amount appropriated. Generally, expenditures were less than the amount appropriated (only 70 percent from 1934 to 1942). Thus, the actual Army expenditures on the air component were somewhat less than those listed.

---

*Source: The Army Almanac: A Book of Facts Concerning the Army of the United States* (Washington, D.C.: Government Printing Office, 1950), 692 (foldout). This source gives no figures for 1919–21; however, Maurer Maurer's *Aviation in the U.S. Army, 1919–1939* (Washington, D.C.: Office of Air Force History, 1987), 475, gives the Air Service an average of 8.8 percent of the Army budget for those three years. Maurer also lists the Air Corps share between 1923 and 1941 as only 8.8 percent of the Army budget (475–76).

**Table 2**
**Army and Navy Air Budgets, 1922–41 (in millions of dollars)**

| *Year* | *Total Army and Navy Expenditures* | *Army and Navy Air Expenditures* | *Air % of Army/Navy Expenditures* |
|---|---|---|---|
| **1922** | $ 934.5 | $36.9 | 3.96 |
| **1923** | 730.2 | 35.9 | 4.93 |
| **1924** | 689.2 | 27.9 | 4.06 |
| **1925** | 717.1 | 25.0 | 3.50 |
| **1926** | 676.8 | 30.8 | 4.55 |
| **1927** | 688.0 | 32.3 | 4.70 |
| **1928** | 732.3 | 41.8 | 5.71 |
| **1929** | 790.5 | 51.8 | 6.56 |
| **1930** | 839.0 | 56.8 | 6.78 |
| **1931** | 832.4 | 68.5 | 8.24 |
| **1932** | 833.8 | 64.7 | 7.76 |
| **1933** | 783.9 | 53.3 | 6.80 |
| **1934** | 705.5 | 33.5 | 4.76 |
| **1935** | 924.2 | 42.1 | 4.56 |
| **1936** | 1,147.4 | 55.0 | 4.79 |
| **1937** | 1,184.7 | 67.5 | 5.70 |
| **1938** | 1,240.3 | 111.6 | 9.00 |
| **1939** | 1,367.9 | 130.6 | 9.54 |
| **1940** | 1,798.6 | 157.6 | 8.76 |
| **1941** | 6,252.0 | 796.1 | 2.89 |
| **Average Army/Navy Budget=$1,193.4** | | **Average Air Budget=$95.9** | **Average Air %=8.04** |

*Source:* Aircraft Industries Association of America, *Aviation Facts and Figures,* 1945, ed. Rudolf Modley (New York: McGraw-Hill, 1945), 54.

on 4 April the Army chief of staff, Gen Douglas MacArthur, told him that he would support the abolition of *all* military aviation, stating that the Air Corps "was already receiving 25–35 percent of the Army budget and was constantly asking for more." The Air Corps was simply too expensive: "Money spent on aviation was money thrown away." Moreover, the general stated that the government should not even subsidize civilian aviation, "directly or indirectly."[2] One of MacArthur's top subordinates expressed similar feelings.

In 1933 MacArthur directed the Drum Board (chaired by Maj Gen Hugh Drum) to study the needs of Army aviation. It concluded that the Air Corps required 2,320 aircraft to carry out the Army's "Air Plan for the Defense of the United States." At that time, the Air Corps possessed only 1,685 aircraft—even less than the 1,800 authorized by Congress; yet, the board recommended *against* increasing the Air Corps if expansion would come at the expense of the other Army branches.[3] In 1934 the Army rank-ordered its priorities

for modernization: tanks, artillery, field forces, and then aircraft. Three years later, it moved another weapon to the head of the list—antiaircraft artillery (AAA).[4]

In truth, an inherent part of the Army's culture calls for placing greater emphasis on men than on equipment. But this philosophy proved disastrous for an air arm dependent on new equipment: aircraft technology was advancing so rapidly that a "procurement holiday" would soon leave the Air Corps with hopelessly obsolete planes. MacArthur acknowledged the Army's philosophy, testifying before Congress that he "endeavored determinedly" to maintain an adequate *personnel* structure, even though that meant "continuing in service obsolete and inefficient equipment" and "slackening technical development."[5] This type of resistance towards airpower from the Army hierarchy caused Congress to intervene periodically and insist that more funds be diverted to the air arm. In 1935 Army intransigence towards modernization led one congressman to ask if it were really

wise to "China-ize" the Army by buying "more men and more men and less equipment." His colleagues tended to agree; therefore, each year from 1933 to 1941, Congress included in its appropriations bills language insisting that certain sums be expended "for the production or purchase of new airplanes and their equipment and their accessories" and that the bulk of these funds be used "exclusively for combat airplanes."[6] In short, Congress wanted to ensure that the War Department did not divert Air Corps funds for other purposes.

Even so, congressional oversight was sometimes thwarted. When Congress held hearings on airpower, which it did on numerous occasions during the interwar period, Army leaders were not anxious to have airmen testify about the dismal state of their branch. For example, in 1934 President Franklin D. Roosevelt appointed a Federal Aviation Commission chaired by Clark Howell to study the subject of military aviation. In response, MacArthur had his staff prepare an 86-page document spelling out

War Department policy on the subject. He then ordered that all Air Corps officers called to testify before the commission were simply to read from the prepared text and volunteer no opinions contrary to established Army policy. When the commission summoned six Air Corps officers to testify, the Army turned up the heat, telling the officers that they could indeed answer the summons but that they would have to pay their own expenses to and from Washington. And, of course, they would have to clear their testimony in advance through the War Department.[7]

Manning was also an issue within the air arm. Between 1923 and 1941, the Army, on average, was manned at 93.2 percent of its authorized strength. The officer corps fared slightly better at 95.7 percent (table 3). One must keep two key statistics in mind concerning the branches: the actual manning level of that branch and the number of officers possessing that specialty throughout the Army. In other words, although one might find the appropriate number of

**Table 3**
**Army Officer Manning between the World Wars, Total and by Branch**
**(selected years and average, 1923–41)**

| | *1925* | *1930* | *1935* | *1940* | *Average (%)* |
|---|---|---|---|---|---|
| **Officers (Authorized)** | 11,999 | 12,322 | 12,403 | 16,719 | |
| **Officers (Actual in Army)** | 12,346 | 12,160 | 11,985 | 13,879 | 95.7 |
| **Infantry (Authorized)** | 3,555 | 3,312 | 3,312 | 3,511 | |
| **Infantry (in Army)** | 3,736 | 3,679 | 3,608 | 3,577 | 106.8 |
| **Infantry (in Branch)** | 2,630 | 2,303 | 2,292 | 2,078 | 68.5 |
| **Cavalry (Authorized)** | 900 | 749 | 749 | 852 | |
| **Cavalry (in Army)** | 1,047 | 984 | 909 | 915 | 117.3 |
| **Cavalry (in Branch)** | 635 | 609 | 570 | 520 | 72.2 |
| **Field Artillery (Authorized)** | 1,411 | 1,499 | 1,499 | 1,444 | |
| **Field Artillery (in Army)** | 1,388 | 1,475 | 1,569 | 1,700 | 103.9 |
| **Field Artillery (in Branch)** | 1,022 | 903 | 988 | 966 | 67.1 |
| **Coast Artillery (Authorized)** | 1,000 | 945 | 945 | 1,072 | |
| **Coast Artillery (in Army)** | 1,009 | 995 | 1,020 | 1,175 | 104.6 |
| **Coast Artillery (in Branch)** | 764 | 655 | 694 | 904 | 74.1 |
| **Signal Corps (Authorized)** | 268 | 260 | 260 | 299 | |
| **Signal Corps (in Army)** | 218 | 256 | 249 | 292 | 93.3 |
| **Signal Corps (in Branch)** | 201 | 208 | 207 | 282 | 81.9 |
| **Air Corps (Authorized)** | 1,247 | 1,650 | 1,650 | 2,067 | |
| **Air Corps (in Army)** | 913 | 1,207 | 1,303 | 2,210 | 80.7 |
| **Air Corps (in Branch)** | 894 | 1,271 | 1,226 | 2,072 | 78.9 |

*Source:* Compiled from *Report of the Secretary of War to the President* (Washington, D.C.: Government Printing Office, 1923–41).

infantry or cavalry officers in the Army, the fact that many of them served in a headquarters, on attaché duty, in faculty positions, and so forth, meant that the number actually serving in their home branch would generally be lower than the authorized strength of that branch. This margin allowed an expertise to reside in the Army as a whole that could be called upon in the event of war—in other words, a "surge capability." Thus, the infantry, on average, had 106.8 percent of its authorized officers in the Army during the interwar period, but only 68.5 percent actually served in the infantry branch during that same period. The air arm found itself in an anomalous position because relatively few aviators had the rank or experience deemed necessary to serve in the staff billets noted above. As a result, the Air Service/Air Corps between the wars, on average, had only 80.7 percent of its authorized officer strength, while the branch itself was manned at 78.9 percent—few additional airmen in the Army could return to their branch in the event

of a crisis.[8] When a "surge" became necessary, there was nothing to surge with. Indeed, until 1929 the cavalry branch was manned with more officers and at a higher percentage than was the Air Corps. One should also note that, on average, between 1919 and 1941 the air arm comprised only 9.17 percent of the Army's total strength.[9] Clearly, the air arm was not manned at the expense of the rest of the Army.

This low level of emphasis and support becomes more understandable when one realizes that as late as 1939, of 793 regular colonels in the US Army, only 25 (3.2 percent) were in the Air Corps. Worse, of 68 general officers of the line in the US Army that year, not one belonged to the Air Corps.[10] The Air Corps had general officers, usually three or four at any given time, but their ranks were temporary and went with the positions they occupied—not the individuals. Hence, when an officer left a general officer's position, he reverted to his "permanent" rank—a system that invited mischief. In 1935, for example, MacArthur

named Frank Andrews commander of General Headquarters (GHQ) Air Force, promoting him to the temporary rank of brigadier general and soon after to major general. Andrews, a believer in strategic airpower, pushed aggressively to buy the new B-17 long-range bomber. The Army hierarchy resisted such procurement plans, insisting instead on the purchase of the Douglas B-18 medium bomber. (In World War II, the B-18 proved useless as a combat aircraft, so the 350 planes purchased were quickly relegated to duty on coastal patrol and as navigation trainers.)

When MacArthur retired, Gen Malin Craig took his place. No supporter of either Andrews or airpower, Craig declined to move Andrews into a general officer's slot when he completed his tour at GHQ Air Force. In fact, it appears that after the death of Maj Gen Oscar Westover, the Air Corps chief, in a plane crash, Andrews received consideration as his replacement. During an interview, Craig pointedly asked Andrews if he would cease his agitation for buying more B-17s

if selected as chief. Andrews rejected the bribe and, as a result, reverted to his permanent rank of colonel; he was reassigned as air officer for the VIII Corps area in San Antonio, Texas—the same position, indeed the precise office, to which Billy Mitchell had been exiled in 1925.[11] Craig's message was not a subtle one.

No service today would consider 12 percent of another service's budget as equitable or want all of its most senior positions occupied by officers from another service. Neither would it care to have them selected by the officers of another service. Although one could argue that airpower's capabilities at the time did not justify additional funds, that was precisely the airmen's point: the paltry sums given to airpower allowed it no opportunity to develop into a powerful weapon.

Notes

1. Maurer Maurer, *Aviation in the U.S. Army, 1919–1939* (Washington, D.C.: Office of Air Force

History, 1987), 477. No other source gives such a high figure for the Air Corps budget share.

2. Nancy H. Hooker, ed., *The Moffat Papers: Selections from the Diplomatic Journals of Jay Pierrepont Moffat, 1919–1943* (Cambridge, Mass.: Harvard University Press, 1956), 60, 63–64, 69, 92; and diary of Secretary of State Henry L. Stimson, 3 June 1932, Stimson Papers, Yale University Library. The story is also told in James P. Tate, *The Army and Its Air Corps: Army Policy toward Aviation, 1919–1941* (Maxwell AFB, Ala.: Air University Press, 1998), 97–98. See also E. R. Perkins, ed., *Foreign Relations of the United States, 1932,* vol. 1, *General* (Washington, D.C.: Government Printing Office, 1948), 65. In 1932 the Air Corps received 9.6 percent of the Army budget, not 25–35 percent as MacArthur stated.

3. John F. Shiner, *Foulois and the U.S. Army Air Corps, 1931–1935* (Washington, D.C.: Office of Air Force History, 1983), 121; and Maurer, 297.

4. Allan R. Millett and Peter Maslowski, *For the Common Defense: A Military History of the United States of America* (New York: Free Press, 1984), 380.

5. Elias Huzar, *The Purse and the Sword: Control of the Army by Congress through Military Appropriations, 1933–1950* (Ithaca, N.Y.: Cornell University Press, 1950), 140.

6. Ibid., 299.

7. DeWitt S. Copp, *A Few Great Captains: The Men and Events That Shaped the Development of U.S. Air Power* (Garden City, N.Y.: Doubleday, 1980), 250–62; and Martha Byrd, *Kenneth N. Walker: Airpower's Untempered Crusader* (Maxwell AFB,

Ala.: Air University Press, 1997), 45–47. The six officers, all of whom testified, included Maj Don Wilson, Capt Harold L. George, Capt Claire Chennault, Capt Robert Webster, Capt Robert Olds, and Lt Ken Walker. In his memoirs, Chennault maintained that his testimony essentially ended his career and forced an early retirement. See Claire Lee Chennault, *Way of a Fighter: The Memoirs of Claire Lee Chennault,* ed. Robert Hotz (New York: G. P. Putnam's, 1949), 18.

8. *Report of the Secretary of War to the President* (Washington, D.C.: Government Printing Office, 1923–1941).

9. Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, D.C.: Smithsonian Institution Press, 1992), appendix 1.

10. *Official Army Register, 1939* (Washington, D.C.: Government Printing Office, 1939), 2; and Davis, 11.

11. DeWitt S. Copp, "Frank M. Andrews: Marshall's Airman," in *Makers of the United States Air Force,* ed. John L. Frisbee (Washington, D.C.: Office of Air Force History, 1987), 43–71. At the time of Pearl Harbor, the Air Corps still had fewer than 200 B-17s in the entire inventory.

# Myth 2

Entering World War II, the Air Corps's unbalanced doctrine and force structure leaned too heavily towards strategic bombing. Thus, air support of ground forces was inadequate and largely ignored by airmen.*

The Air Corps Tactical School (ACTS) is often depicted as a hotbed of radicalism, full of proselytizers for strategic airpower.

---

*See, for example, David E. Johnson, *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945* (Ithaca, N.Y.: Cornell University Press, 1998); Timothy Moy, *War Machines: Transforming Technologies in the U.S. Military, 1920–1940* (College Station, Tex.: Texas A&M University Press, 2001); James A. Huston, "Tactical Use of Air Power in World War II: The Army Experience," *Military Affairs* 14 (December 1950): 171–77; Russell F. Weigley, *History of the United States Army* (New York: Macmillan, 1967), 411–15, 474–75; James W. Bradin, *From Hot Air to Hellfire: The History of Army Attack Aviation* (Novato, Calif.: Presidio, 1994), 51–57; and Brad Gladman, "The Development of Tactical Air Doctrine in North Africa, 1940–1943," in *Air Power History: Turning Points from Kitty Hawk to Kosovo*, ed. Sebastian Cox and Peter Gray (London: Frank Cass, 2002), 188, 199–203.

In truth, ACTS was an Army branch school, designed to teach the fine points of that specific branch, as did the Army's other schools for artillery, infantry, cavalry, and so forth. Nonetheless, 50 percent of the ACTS curriculum in the mid-1930s did not even deal with air matters. Rather, it covered lessons applicable to other Army branches (taught by faculty instructors from those branches) and naval affairs (taught by Navy officers).[1] In addition, because ACTS was a staff college, it devoted much time to the rudiments of being a staff officer—writing, briefing, logistics, administration, intelligence, and so forth. Only part of the 50 percent of the curriculum devoted to air matters focused on strategic bombing since it also covered pursuit, attack, and observation. In the 1935 curriculum, for example, 44 out of 494 class periods (8.9 percent) were devoted to "bombardment."[2] The school allocated far more time—158 periods—to "equitation" (horseback riding) that year. Certainly, ACTS took very seriously the budding doctrine of strategic bombardment and considered it the highlight of

the academic curriculum. However, ACTS's *saying that* it took strategic bombardment seriously is a far cry from maintaining that bombardment dominated the curriculum. It did not.

As for official Army doctrine—which the Air Corps had to follow—Field Manual (FM) 1-5, *Employment of Aviation of the Army*, dated 15 April 1940, stated that offensive air forces would receive their targets from the "field commander," a soldier. It also noted that the first priority for those targets was to "decisively defeat important elements of the enemy armed forces." A revised version of FM 1-5 appeared in January 1943 but still emphasized this targeting precedence.[3] The Louisiana and Carolina Maneuvers of 1941 clearly demonstrated these priorities and command relationships when the Army field commander used the air assets at his disposal—600 aircraft—exclusively for support of the ground forces. The Army devised a scenario for these games that required the service to expel an invasion force that had already landed in the United States. Since the

scenario did not address how or from where the invaders arrived at our shores, it specifically precluded strategic air operations.[4]

As for force structure, if it is true that the Air Corps favored strategic bombing, then one would expect to see that preference reflected in iron on the ramp. But reality indicates otherwise. When World War II broke out in Europe in September 1939, the US Army Air Corps had a total of 28 strategic bombers: 26 B-17s, one experimental B-15, and one experimental B-19.[5] The United States then began to rearm, slating airpower for a large buildup. Over the next two years, the Air Corps—soon to become the Army Air Forces (AAF) in June 1941—purchased nearly 21,000 aircraft. Of those 20,914 planes, 373 were strategic bombers: 197 B-17s and 176 B-24s.[6] Clearly, those bombers—1.8 percent of the total aircraft bought during that crucial two-year period—do not represent a serious imbalance in favor of strategic bombing.

In fact, "attack" aircraft—those specifically designed to support ground forces—

were always a priority within the Air Corps and AAF. The first all-metal monoplane in the Air Corps, the Curtiss A-8 Shrike, entered the inventory in 1932, nearly two years before the Martin B-10—the Army's first modern bomber.[7] In 1944 the AAF's Ninth Air Force in Europe consisted of 4,500 aircraft—the largest tactical air unit in history, even larger than the Luftwaffe's entire combat strength at the time.[8] The Ninth had as its mission the support of Gen Omar Bradley's 12th Army Group. In addition the Twelfth Air Force and the British 2d Tactical Air Force supported Allied ground operations in France, as did, on occasion, the heavy bombers of the Royal Air Force's (RAF) Bomber Command and Eighth Air Force. Moreover, during the war the AAF purchased nearly 23,000 cargo aircraft, primarily using them to transport Army ground troops and supplies.[9]

Some people have argued that a "bomber mafia" dominated Air Corps thinking, implying that this group controlled most of the key command and

staff positions before, during, and after World War II.[10] If that is so, then fighter pilots and tactical aviation in general would have suffered as a result. Even a cursory look at the facts is sufficient to refute this allegation. A number of fighter and attack pilots rose to high rank during and after the war. Hoyt Vandenberg, a career fighter pilot who became the Air Force chief of staff in 1948, commanded Ninth Air Force in Europe. Other tactical airmen who achieved high rank included Nathan Twining (commander of Fifteenth and then Twentieth Air Forces, later Air Force chief of staff, and ultimately chairman of the Joint Chiefs of Staff [JCS]), George Kenney (commander of Far East Air Forces under MacArthur and, after the war, the first commander of Strategic Air Command), Earle "Pat" Partridge (commander of Eighth Air Force at the end of the war, of Far East Air Forces during the Korean War, and then of North American Air Defense Command), Ira Eaker (commander of Eighth Air Force, then of Mediterranean Allied Air Forces, and the deputy commander of

the AAF after the war), Joe Cannon (commander of Twelfth Air Force, of US Air Forces Europe after the war, and then of Tactical Air Command), Millard "Miff" Harmon (commander of all air forces in the Pacific Ocean areas before dying in a plane crash near the end of the war), and Elwood "Pete" Quesada (commander of XIX Tactical Air Command and of Tactical Air Command after the war). In fact, when Gen Henry "Hap" Arnold told Eaker that he had selected him as commander of Eighth Air Force in England, Eaker asked why, since he had flown fighters his entire career. Precisely for that reason, Arnold responded: he wanted Eaker to instill "the fighter pilot spirit" in bomber crews.[11] Obviously, tactical aviation and its practitioners did not suffer at the hands of a bomber mafia.

Notes

1. Robert T. Finney, *History of the Air Corps Tactical School, 1920–1940*, USAF Historical Studies

no. 100 (1955; reprint, Washington, D.C.: Center for Air Force History, 1992), 35.

2. "Comparison of Courses," Air Corps Tactical School, 1 July 1934. The "Air Force Section" also had lessons on bombardment; even if those are included, bombardment still equates to around only 10 percent of the ACTS curriculum. See, for example, "Syllabus, 1938–39," 27 April 1939, United States Air Force Historical Research Agency (hereafter AFHRA), Maxwell AFB, Ala., file 248.2208B.

3. Field Manual (FM) 1-5, *Employment of Aviation of the Army*, 15 April 1940, 13; and FM 1-5, *Employment of Aviation of the Army*, 18 January 1943, 14.

4. Christopher R. Gabel, *The U.S. Army GHQ Maneuvers of 1941* (Washington, D.C.: Center of Military History, United States Army, 1991), 55, 179–82.

5. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 6, *Men and Planes* (1955; new imprint, Washington, D.C.: Office of Air Force History, 1983), 176. In 1933 the Drum Board reported that of the 1,685 aircraft in the Air Corps inventory, 156 were bombers (9.2 percent); 453 were pursuit or attack planes (26.8 percent); and the largest number—503—were corps-observation aircraft (29.8 percent). John F. Shiner, *Foulois and the U.S. Army Air Corps, 1931–1935* (Washington, D.C.: Office of Air Force History, 1983), 121.

6. I. B. Holley Jr., *Buying Aircraft: Materiel Procurement for the Army Air Forces* (Washington, D.C.: Office of the Chief of Military History,

Department of the Army, 1964), 550. Henry L. Stimson, the secretary of war, relates that when Gen George Marshall told President Roosevelt that there were only 49 B-17s available in the entire United States for combat, "the President's head went back as if someone had hit him in the chest." Diary of Secretary of State Henry L. Stimson, 27 September 1940, Stimson Papers, Yale University Library.

7. "A"=attack; "B"=bomber; and "P"=pursuit, which later became "F"=fighter.

8. Ninth Air Force and Twelfth Air Force were considered "tactical" air forces in that they consisted largely of fighters and medium bombers. In contrast, Eighth Air Force and Fifteenth Air Force were composed primarily of heavy bombers and their fighter escorts; hence, they were considered "strategic" air forces.

9. Holley, 551.

10. Lt Col Peter R. Faber, "Interwar US Army Aviation and the Air Corps Tactical School: Incubators of American Airpower," in *The Paths of Heaven: The Evolution of Airpower Theory*, School of Advanced Airpower Studies, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), passim.

11. James Parton, *"Air Force Spoken Here": General Ira Eaker and the Command of the Air* (Bethesda, Md.: Adler & Adler, 1986), 128.

# Myth 3

The Air Corps entered World War II with a "Douhetian" concept of air war that emphasized area bombing and the waging of war on women and children.*

Giulio Douhet, an Italian air theorist whose major work—*The Command of the Air*—appeared in 1921, predicted future wars that would employ gas bombs and high explosives against urban centers.[1]

---

*See, for example, John Keegan, *A History of Warfare* (New York: Knopf, 1993), 374–75; Timothy Moy, *War Machines: Transforming Technologies in the U.S. Military, 1920–1940* (College Station, Tex.: Texas A&M University Press, 2001), 7; Walter Millis, *Arms and Men: A Study in American Military History* (New Brunswick, N.J.: Rutgers University Press, 1981), 252–59; F. J. P. Veale, *Advance to Barbarism: How the Reversion to Barbarism in Warfare and War-Trials Menaces Our Future* (Appleton, Wisc.: C. C. Nelson Publishing Co., 1953), chap. 6; Herbert A. Johnson, *Wingless Eagle: U.S. Army Aviation through World War I* (Chapel Hill: University of North Carolina Press, 2001), 216; and Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca, N.Y.: Cornell University Press, 1991), 150. Perhaps one can appreciate the quality of this last assessment by noting that Rosen apparently thought Douhet's first name was Emilio.

No one in the Air Corps hierarchy during the 1930s advocated such an air strategy. On the contrary, for various military, legal, and humanitarian reasons, the Air Corps expressly rejected this type of strategy, opting for a doctrine of high-altitude, daylight, precision, and formation bombing of industrial targets. It singled out specific military targets for attack—key systems such as transportation networks; oil, electricity, and chemical facilities; and munitions factories.[2] In August 1941, Air War Plans Division, Plan 1 (AWPD-1) called for the destruction of Germany's industrial structure through a sustained bombing campaign. Its objectives strikingly resembled those of the prewar theories of ACTS—no surprise since four former ACTS instructors had written the plan.

FM 1-5, the doctrine manual that AAF took into the war listed several potential target systems for attack after having sufficiently addressed the first priority (enemy forces): raw materials; rail, water, and motor transportation systems; power plants, transmission lines, and other

utilities; factories; steel mills; oil refineries; "and other similar establishments."[3] It does not mention the targeting of population centers or civilian morale. (Contrary to popular belief, the RAF had almost exactly the same doctrine in the interwar years. It was no more "Douhetian" than the AAF's.[4]) On the other hand, the bleak realities of war, coupled with the technological limitations of contemporary aircraft and bombsights, the miserable weather over both Germany and Japan, and extremely stiff enemy defenses, rendered prewar doctrine insufficient. But few soldiers, sailors, or marines accurately predicted what the war would look like either, as Pearl Harbor, Savo Island, Bataan, Kasserine Pass, and Tarawa painfully illustrated. All of the services needed time to adjust to the war's realities.

Notes

1. A revised version of *The Command of the Air* was published in 1927. This edition was translated

into English by Dino Ferrari, published in 1942, and reprinted by the Office of Air Force History in 1983.

2. Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm, 1917–1941,* USAF Historical Study no. 89 (1955; reprint, Washington, D.C.: Office of Air Force History, 1985), 57–60. For typical examples of ACTS lectures on the subject, see "ACTS: Bombardment Text," 1 October 1933, AFHRA, file 248.101-9; and "ACTS: Bombardment Aviation," 1 January 1938, AFHRA, file 168.7001-28.

3. Field Manual (FM) 1-5, *Employment of Aviation of the Army,* 15 April 1940, 36.

4. For a discussion of RAF doctrine, see Phillip S. Meilinger, "Trenchard and 'Morale Bombing': The Evolution of Royal Air Force Doctrine before World War II," *Journal of Military History* 60 (April 1996): 243–70.

# Myth 4

**Airmen thought they could win the war alone.***

Airmen did not believe they could win the war alone; rather, they thought airpower could play a dominant or decisive role in Western Europe and the Pacific—just as soldiers and sailors believed they could play such roles. Airmen realized the importance of the attrition that the German war machine was experiencing on the Eastern Front—where it had directed the vast bulk of its forces—as well as the serious effects of the US Navy's unrestricted submarine-warfare campaign

*See, for example, Gian P. Gentile, *How Effective Is Strategic Bombing? Lessons Learned from World War II to Kosovo* (New York: New York University Press, 2001), 31; Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914–1945* (Princeton, N.J.: Princeton University Press, 2002), 33, 201–2; Carlo d'Este, *Decision in Normandy* (New York: Dutton, 1983), 215; and Malcolm Smith, "The Allied Air Offensive," *Journal of Strategic Studies* 13 (March 1990): 71, 78, 82.

against Japan. Some airmen *did* maintain that, given a higher priority, strategic bombing—*in conjunction with* these land and sea campaigns—could bring about German and Japanese surrender prior to an invasion of the Continent or of the Japanese home islands. This, in fact, happened in the Pacific, and many believed it could have happened in Europe. When one recalls that much of the Allied bombing effort was diverted to support the Battle of the Atlantic; the invasions of North Africa, Sicily, Italy, and Normandy; the attacks on the German missile sites and submarine pens; the Okinawa campaign; and the B-29 mine-laying operations in Japanese home waters, one can better understand the airmen's argument. Indeed, 72 percent of all Allied bombs and 84 percent of the AAF tonnage fell on Germany *after* 1 July 1944 (fig. 1).[1] In the Pacific, 96 percent of all bombs fell on Japan after 9 March 1945, during the last five months of a four-year war.[2] Airmen have often wondered what the results would have been with different priorities

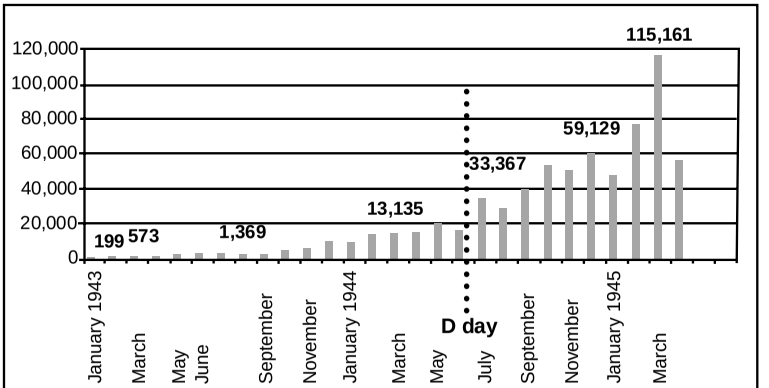



**Figure 1. US Bomb Tonnage Dropped on Germany by Month** (Figures from United States Strategic Bombing Survey, *Statistical Appendix to Over-All Report [European War]* [Washington, D.C.: Government Printing Office, February 1947], 13)

and with this "crescendo of bombing" occurring a year or more earlier.

The use of strategic airpower in the campaigns noted above proved crucial to their success. Gaining air superiority in Europe and the Pacific perhaps stands as the greatest achievement of strategic airpower. Without that superiority, Allied losses—on the ground, at sea, and in the air—would have been prohibitive. As Gen Dwight Eisenhower later admitted, without air superiority Operation Overlord could not have taken place:

> The Normandy invasion was based on a deep-seated faith in the power of the air forces, in overwhelming numbers, to intervene in the land battle. That is, a faith that the air forces, by their action, could have the effect on the ground of making it possible for a small force of land troops to invade a continent. . . . Without that air force, without the aid of its power, entirely aside from its anticipated ability to sweep the enemy air forces out of the sky, without its power to intervene in the land battle, that invasion would have been fantastic. . . . It would have been more than fantastic; it would have been criminal.[3]

The contribution of airpower to the war at sea was also indispensable. Despite the serious losses to Allied shipping suffered

at the hands of German submarines in World War I, the Allies were unprepared for this threat when it reemerged in World War II. Before the war, neither the Royal Navy nor the US Navy had built escort carriers or long-range aircraft that could find and destroy German and Japanese submarines far out to sea. The Battle of the Atlantic, crucial to the survival of Britain, remained touch and go until mid-1943. At that point, long-range aircraft, notably Consolidated B-24 Liberators, were employed in large numbers to close the mid-Atlantic gap, where German submarine wolf packs had long enjoyed sanctuary. Overall, airpower destroyed 368 U-boats and assisted in the destruction of 48 more—60 percent of all German submarines lost to enemy action. Of the 368 sunk by airpower alone, 307 were destroyed by land-based air. Escort carriers, finally put into action in mid-1943, got the rest.[4]

The merchant fleets of both Germany and Japan also suffered grievous losses due to air attacks. Allied airpower was responsible for over 77 percent of all

German shipping lost between the Bay of Biscay and the North Cape.[5] In the Pacific, although US submarines sank the lion's share of Japanese shipping, Allied aircraft accounted for 47 percent of all Japanese losses.[6] Moreover, aerial mining operations using the B-29s of Gen Curtis E. LeMay's XXI Bomber Command took an ever-increasing toll—sinking 60 percent of all enemy shipping during the last nine months of the war. In addition, these mining operations proved far more cost-effective—both in economic terms and in the number of US casualties—than our submarine operations.[7]

Notes

1. United States Strategic Bombing Survey (USSBS), *The United States Strategic Bombing Survey: Over-All Report (European War)* (Washington, D.C.: Government Printing Office, 30 September 1945), 10. President Roosevelt chartered USSBS in 1944 to examine the effects of strategic bombing on Germany and Japan. The survey was headed by Franklin D'Olier, head of the Prudential Insurance Company, who had no previous experience with aviation. D'Olier divided the roughly 1,500 members of

the survey into groups corresponding to target sets: oil, chemicals, transportation, and so forth. Each of these divisions was headed by a distinguished civilian businessman, economist, engineer, or lawyer, including such later luminaries as Paul Nitze, George Ball, and John Kenneth Galbraith. The survey even included Dr. Rensis Likert, a specialist in public-opinion sampling. After examining mountains of documents, interviewing thousands of German and Japanese leaders, and visiting scores of bombed sites, the USSBS produced 212 volumes on the strategic air campaign against Germany and a further 108 reports on Japan. Although the survey has had some detractors over the years, especially regarding internal squabbles between some of its members, no one has attempted to refute its findings—the survey's research and documentation are simply too thorough and massive to contest.

2. USSBS, *Statistical Appendix to Over-All Report (European War)* (Washington, D.C.: Government Printing Office, February 1947), 13; and idem, *Summary Report (Pacific War)* (Washington, D.C.: Government Printing Office, July 1946), 16. In 1987 Air University Press reprinted the European and Pacific summary volumes together in one volume.

3. Senate, *Testimony of Gen Dwight D. Eisenhower, Department of Armed Forces, Department of Military Security: Hearings before the Committee on Military Affairs on S. 84 and S. 1482*, 79th Cong., 1st sess., 1945, 360.

4. John Terraine, *The U-Boat Wars, 1916–1945* (New York: Putnam, 1989), 772–73. Terraine notes

that 62 of those submarines were destroyed in port by Allied bombing.

5. Richard P. Hallion, "The Second World War as a Turning Point in Airpower," in *Air Power History: Turning Points from Kitty Hawk to Kosovo,* ed. Sebastian Cox and Peter Gray (London: Frank Cass, 2002), 100. For an excellent overview of this campaign, see Christina J. M. Goulter, *A Forgotten Offensive: Royal Air Force Coastal Command's Anti-Shipping Campaign, 1940–1945* (London: Frank Cass, 1995).

6. Hallion, 111.

7. Ibid., 113.

## Myth 5

The fact that German production, especially of aircraft, continued to increase throughout 1944 proves that the Combined Bomber Offensive (CBO) was ineffective and that the resources devoted to it would have been better spent elsewhere.*

Production did increase in Germany through the first half of 1944; it then began falling precipitously in virtually all categories, starting in the autumn of that year. Most of the production increase resulted from a slack German economy—it

*See, for example, J. F. C. Fuller, *The Conduct of War, 1789–1961: A Study of the Impact of the French, Industrial, and Russian Revolutions on War and Its Conduct* (New Brunswick, N.J.: Rutgers University Press, 1961), 303; Hans Rumpf, *The Bombing of Germany*, trans. Edward Fitzgerald (New York: Holt, Rinehart and Winston, 1963), 167–72; Stephen A. Garrett, *Ethics and Airpower in World War II: The British Bombing of German Cities* (New York: St. Martin's Press, 1993), 161–64; and Alan S. Milward, *The German Economy at War* (London: University of London, Athlone Press, 1965), 162–89.

had not been fully mobilized for war at the outset of hostilities—and tremendous inefficiency caused by the lack of centralized control over raw materials and production assets. (Studies after the war, for example, revealed that the automobile industry—the largest sector of the German economy in the 1930s—operated at barely 50 percent of its capacity during the war.[1]) The appointment of Albert Speer as minister of armaments and war production in early 1942 remedied many of these maladies. Speer quickly reorganized the entire German armaments industry, making it far more efficient and responsive.

The real issue is what German leaders *expected* to produce in 1944 versus what they actually *did* produce. The difference between those figures is largely attributable to the effectiveness of the CBO. In January 1945, Speer reported that during the previous year, Germany had produced 35 percent fewer tanks, 31 percent fewer aircraft, and 42 percent fewer trucks than planned.[2] (Recall the statistics, mentioned previously, regarding the period of time when the preponderance of

bombs actually fell on Germany.) German industry could surge in 1943 and early 1944 largely because it had not yet undergone serious attacks; when the attacks came, the results were dramatic. As Speer later wrote, "I shall never forget the date May 12 [1944]. . . . On that day the technological war was decided. Until then we had managed to produce approximately as many weapons as the armed forces needed, in spite of their considerable losses. But with the attack of nine hundred and thirty-five daylight bombers of the American Eighth Air Force upon several fuel plants in central and eastern Germany, a new era in air war began. It meant the end of German armaments production."[3] Events bore this out. In January 1945, Speer wrote Adolf Hitler that "the war was over in the area of heavy industry and armaments. . . . From now on the material preponderance of the enemy can no longer be compensated for by the bravery of our soldiers."[4]

As for aircraft production, the manufacture of *fighters* presumably did increase in 1944 but did so at the expense

of bomber and cargo aircraft production—65 percent of all planes accepted by the Luftwaffe in 1944 were single-engine fighters.[5] In 1942 bombers accounted for over half of all aircraft produced, but by 1944 that number had dropped to 18 percent. The CBO forced Germany to stop building *offensive* weapons and concentrate instead on *defensive* ones in an unsuccessful effort to stop the Allied bombing campaign.

Even so, the *supposed* increase in fighter production is suspect. Large discrepancies existed between the number of fighters allegedly produced and the number actually employed by the Luftwaffe. One can offer three explanations for this anomaly: (1) the aircraft were not actually built at all; frightened factory managers simply padded the numbers to avoid recriminations from the gestapo; (2) the factory counted repaired aircraft as "new" ones (the Luftwaffe didn't count that way); or (3) even if the factories actually built new aircraft, the Allies destroyed them en route to the airfields—accounting for up

to 20 percent of total production.[6] In reality, despite all of these production and acceptance statistics, one can best understand the weakness of the Luftwaffe by realizing that by April 1944 the Germans had only 300 fighters in the west to oppose 12,000 Allied aircraft—and only 500 in the east to oppose 13,000 Soviet aircraft.[7] As a consequence, on D day the Luftwaffe flew only 319 sorties—most of which failed to reach the beachhead and none of which inflicted significant damage—compared to the Allies, who flew 12,015.[8] Only six days after the landings, Prime Minister Winston Churchill and the combined chiefs of staff thought the air situation safe enough that they actually visited the beachhead. At the same time, Hitler spent more and more time in bunkers to avoid Allied bombs.

One should also note that because Allied bombing had so disrupted the Luftwaffe's oil supply, new pilots entered combat with barely 50 hours of flying time, making them little more than cannon fodder for the well-trained Allied

fighter pilots.[9] In fact, by mid-1944 Allied pilots commonly flew dozens of combat missions without even seeing an enemy aircraft.[10] Essentially, the Luftwaffe had been eliminated as a threat to the Allied invasion, despite what the production figures allegedly illustrated.

Even if we sweep all those arguments aside, let us revisit the basic charge: that because production increased, the CBO was a failure. Consider the fact that in 1939 the German army consisted of 120 divisions. Yet, despite four years of war and the combined efforts of the Soviet, American, British, and French armies, it had grown to 318 divisions by 1944.[11] Using the logic of the production argument, the actions of the Allied armies amounted to a dismal failure—no matter how hard they fought, the German army continued to grow. Such (fatuous) logic would force us to conclude that the Allies would have been better off spending their money on something besides ground forces.

## Notes

1. Richard Overy, *Why the Allies Won* (London: Jonathan Cape, 1995), 203. Overy is recognized as one of the world's top military historians, but he is also an economic historian, which makes him especially authoritative on discussions of airpower or sea power as forms of economic war.

2. Ibid., 131.

3. Albert Speer, *Inside the Third Reich: Memoirs*, trans. Richard and Clara Winston (New York: Macmillan, 1970), 346. Ultra intercepts revealed that the day after the attack—13 May—AAA batteries were urgently redeployed to protect the oil refineries; the day after that, motor transport units, including combat units, received orders to switch from gasoline to wood gas in an effort to conserve precious fuel. United States National Security Agency/Central Security Service, *ULTRA History of U.S. Strategic Air Force Europe vs. German Air Force*, National Security Agency Special Study SRH-013 (June 1945; copy, Washington, D.C.: 1978?), 178–80.

4. Speer, 424.

5. United States Strategic Bombing Survey (USSBS), *The United States Strategic Bombing Survey: Over-All Report (European War)* (Washington, D.C.: Government Printing Office, 30 September 1945), 18; and Overy, 129.

6. USSBS, 18–22.

7. Overy, 124.

8. John Keegan, *Six Armies in Normandy: From D-Day to the Liberation of Paris, June 6th–August 25th, 1944* (New York: Viking Press, 1982), 143.

9. USSBS, *Oil Division Final Report* (Washington, D.C.: Government Printing Office, August 1945), 2.

10. One P-47 pilot stated that he flew 70 combat missions with the Ninth Air Force between July 1944 and the end of the war but saw an enemy aircraft on only one mission. Robert V. Brulle, *Angels Zero: P-47 Close Air Support in Europe* (Washington, D.C.: Smithsonian Institution Press, 2000), 122, 156.

11. David T. Zabecki, ed., *World War II in Europe: An Encyclopedia*, vol. 1 (New York: Garland Publishing, 1999), 625.

# Myth 6

Bombing was ineffective because it actually stiffened rather than lowered enemy morale.*

In truth, the United States Strategic Bombing Survey (USSBS) reported that "bombing appreciably affected the German will to resist. Its main psychological effects were defeatism, fear, hopelessness, fatalism, and apathy. It did little to stiffen resistance through the arousing of aggressive emotions of hate and anger. War weariness, willingness to surrender, loss of hope in German victory, distrust of leaders, feelings of disunity,

*See, for example, Thomas R. Phillips, "Preview of Armageddon," *Saturday Evening Post,* 12 March 1938, 12; Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, N.Y.: Cornell University Press, 1996), 269–73; Hans Rumpf, *The Bombing of Germany,* trans. Edward Fitzgerald (New York: Holt, Rinehart and Winston, 1963), 233; and Stephen A. Garrett, *Ethics and Airpower in World War II: The British Bombing of German Cities* (New York: St. Martin's Press, 1993), 158–61.

and demoralizing fear were all more common among bombed than among unbombed people."[1] In addition, air attack had an enormous effect on German troops, representing "a chronic cause of fear, discouragement and confusion, and a potentially serious disrupter of discipline. . . . Air power when employed against lines of communication and transportation plays a vital role not only in producing the more obvious military isolation of the battlefield, but intensifies feelings of anxiety and frustration."[2]

Regarding the Japanese population, the USSBS observed that "civilian morale was predominantly, but not completely, destroyed. Just before the end of the war there was still roughly one-fourth of the civilian population with some confidence in victory and willingness to go on."[3] In other words, 75 percent of the Japanese had given up hope. Although it is probably true that, initially, morale spiked among the enemy population (applying pressure to an object generally tends to consolidate that object before fracturing it), overall no evidence exists to support

the claim that air attack bolstered enemy morale.

As for the actual *performance* of German and Japanese workers, important criteria involve factors such as absenteeism. Whether or not a factory worker admits to bad morale, if he or she fails to show up for work because of the bombing campaign, then bombing is achieving one of its goals. In mid-1945, when the bombing campaign against Japan reached its height, absenteeism in Japanese factories approached 50 percent. Nearly 8.5 million people had fled the cities to escape the bombing campaign nationwide; of those, nearly one-third were factory workers—certainly not an indication of increasing morale.[4] In Germany, absenteeism averaged 20 to 25 percent in many key factories.[5] Thus, performance suffered greatly in both Germany and Japan, as did morale. Three-quarters of the German people thought the war was lost by the beginning of 1944; when asked by Gallup pollsters after the war about the hardest thing they had to endure, 91 percent

pointed to the Allied bombing.[6] A classic study conducted after the war confirmed the USSBS findings. This work, which studied morale during bombing, also concluded that the people directed their anger at their leaders for failing to protect them—not against Allied airmen.[7]

Notes

1. United States Strategic Bombing Survey (USSBS), *The United States Strategic Bombing Survey: Over-All Report (European War)* (Washington, D.C.: Government Printing Office, 30 September 1945), 95–96.

2. USSBS, *The Effects of Strategic Bombing on German Morale,* vol. 2 (Washington, D.C.: Government Printing Office, December 1946), 41–42.

3. USSBS, *The Effects of Strategic Bombing on Japanese Morale* (Washington, D.C.: Government Printing Office, June 1947), 32.

4. Ibid., 13; and USSBS, *The Effects of Strategic Bombing on Japan's Urban Economy* (Washington, D.C.: Government Printing Office, March 1947), 25.

5. Richard Overy, *Why the Allies Won* (London: Jonathan Cape, 1995), 133. Interestingly, approximately 2.7 million British civilians left the major industrial cities during the war to escape German bombing, which was on a far lower scale than was the Allied bombing of Germany. Richard M. Titmuss, *History of the Second World War,* vol. 2,

*Problems of Social Policy* (London: His Majesty's Stationery Office, 1950), 345.

6. USSBS, *Over-All Report (European War)*, 96; and Overy, 132.

7. Irving L. Janis, *Air War and Emotional Stress: Psychological Studies of Bombing and Civilian Defense*, RAND note (New York: McGraw-Hill, 1951), see especially chap. 7, "Aggression and Wartime Morale." Janis also notes that the willingness to endure bombing was proportional to the distance from the bombing. In other words, people living in the countryside did not believe that bombing affected their morale; those in the cities being bombed felt otherwise. For a similar appraisal, see Fred Charles Iklé, *The Social Impact of Bomb Destruction* (Norman: University of Oklahoma Press, 1958), 27–34.

# Myth 7

> The atomic bombs were unnecessary because Japan was about to surrender; even if it had not given up, an invasion or continued blockade would have been more humane.*

Nothing indicates that anyone in authority within the Japanese government was seriously contemplating surrender in late July or early August 1945. On 26 July, the Japanese rejected President Harry Truman's Potsdam Declaration,

---

*See, for example, Fleet Adm William D. Leahy, *I Was There: The Personal Story of the Chief of Staff to Presidents Roosevelt and Truman* (New York: Whittlesey House, 1950), 441; Fleet Adm Ernest J. King and Walter Muir Whitehill, *Fleet Admiral King: A Naval Record* (New York: W. W. Norton, 1952), 621; B. H. Liddell Hart, *History of the Second World War* (New York: Putnam's, 1970), 696–98; D. Clayton James, *The Years of MacArthur,* vol. 2, *1941–1945* (Boston: Houghton Mifflin, 1975), 775 (James quotes MacArthur as saying the bombs were "completely unnecessary"); and E. B. Potter, *Nimitz* (Annapolis: Naval Institute Press, 1976), 386 (according to Potter, Nimitz thought the atomic bomb "indecent" and unnecessary). See also Robert A. Pape, *Bombing to Win: Air*

which called on Japan to surrender but also suggested that survival of the emperor was acceptable. Intercepts of Top Secret Ultra messages in June and July revealed that the Japanese expected—indeed, hoped for—an invasion. They assumed that the prospect of such a bloodbath (based on casualty figures at Iwo Jima and Okinawa) would deter the Americans from launching an invasion, thus affording the Japanese better peace terms.[1]

As for an invasion, according to US intelligence at the time, the Japanese had increased the number of defenders to over 600,000 on the island of Kyushu—where our first landings, involving approximately 767,000 personnel, were scheduled to occur in November 1945. In reality, postwar findings revealed that

---

*Power and Coercion in War* (Ithaca, N.Y.: Cornell University Press, 1996), 134–36. The intensity of the debate over the atomic bombs has scarcely abated over the years. For a look at the highly visible and messy flap that developed at the National Air and Space Museum over its proposed display of the *Enola Gay*—the B-29 that dropped the atomic bomb on Hiroshima—see Martin Harwit, *An Exhibit Denied: Lobbying the History of Enola Gay* (New York: Copernicus, 1996).

the enemy had readied closer to 900,000 defenders.[2] An invasion of the main island of Honshu, which would include over 1 million Allied soldiers, sailors, airmen, and marines, was already scheduled for March 1946. Over 2 million Japanese regulars defended this island.

These statistics, combined with the factors below, suggest what an invasion would have meant:

- Japanese soldiers did not surrender but fought to the death—95 percent on average throughout the war, with 97 percent at Saipan and 99 percent at Iwo Jima. Using the previous Pacific campaigns as examples, we can conclude that Japanese military losses due to US invasions would have numbered around 3 million dead.[3]
- Based on the Okinawa campaign, US casualties ran about 35 percent of the number of troops engaged.[4] Thus, of the 1.77 million men scheduled to assault the Japanese home islands, we should have expected in excess of 500,000 casualties. During

World War II, about 30 percent of the US Army's combat casualties were deaths; based on that ratio, the invasions would have killed around 150,000 US troops.[5]

- Japanese civilians tended to get caught in the way when US and Japanese forces fought during World War II. As many as 150,000 Japanese civilians died during the Okinawa campaign, as well as 10,000 Koreans who had been brought in to perform heavy labor.[6] No doubt, hundreds of thousands of Japanese civilians would have been "caught in the way" and killed in the massive ground assaults scheduled for late 1945 and early 1946.

Canceling the invasion and simply maintaining the blockade would have entailed a very long-term strategy with two highly negative effects. First, it would have slowly starved the Japanese population to death, as happened to the Germans in World War I when over 800,000 civilians died as a direct result of

the Allied starvation blockade.[7] Deliberate starvation is no more humane than bombing. Second, while we held back and waited for the blockade to take effect, we would have condemned millions of Asians then under an oppressive Japanese occupation to privation and death. How many more Koreans, Vietnamese, Indonesians, Malays, Chinese, and so forth would have died had we simply waited? As it was, as many as 6 million Asians died under Japanese rule.[8] Critics undoubtedly would have later branded a US policy of waiting as a deliberately racist strategy. In addition, more than 558,000 Allied prisoners of war (POW) and internees remained in captivity in August 1945. Japanese prison camps were notoriously deadly to their unfortunate inhabitants: nearly 40 percent died there. Waiting the Japanese out would almost certainly have condemned these men and women to death.[9]

As for the contentious issue of what role bombing—specifically, the atomic bombs—played in the Japanese decision to surrender, one would do well to

consider some statements made by key Japanese leaders at the time:

- Prince Fumimaro Konoye, president of the Great East Asia League and former premier: "Fundamentally, the thing that brought about the determination to make peace was the prolonged bombing of the B-29s."[10]
- Baron Kantaro Suzuki, premier: "Merely on the basis of the B-29s alone I was convinced that Japan should sue for peace."[11]
- Adm Osami Nagano, supreme naval advisor to the emperor: "If I were to give you one factor as the one leading to your victory, I would give you the Air Force."[12]
- Chief Cabinet Secretary Hisatsune Sakomizu: "The chance had come to end the war. It was not necessary to blame the military side, the manufacturing people, or anyone else—just the atomic bomb. It was a good excuse."[13]
- Emperor Hirohito, radio address announcing surrender, 14 August 1945: "The enemy has begun to

> employ a new and most cruel bomb, the power of which to do damage is, indeed, incalculable, taking the toll of many innocent lives. Should we continue to fight, it would not only result in an ultimate collapse and obliteration of the Japanese nation, but also would lead to the total extinction of human civilization."[14]

The bombing of Japan was a tragedy, and it is regrettable that it had to occur. Undoubtedly, many innocent people died in these air attacks, but, as noted, the alternatives were even deadlier, to both combatants and noncombatants. War often forces a choice between bad alternatives: wise leaders attempt to choose the lesser evil.

## Notes

1. Bruce Lee, *Marching Orders: The Untold Story of World War II* (New York: Crown Publishers, 1995), see chaps. 18–20 for a thorough examination of the various Ultra/Magic messages that discussed the issue of Japanese surrender. The best overall treatment of this contentious issue, which focuses on Japanese sources, is Sadao Asada's "The Shock

of the Atomic Bomb and Japan's Decision to Surrender—A Reconsideration," *Pacific Historical Review* 67 (November 1998): 477–512.

2. Edward J. Drea, *MacArthur's ULTRA: Codebreaking and the War against Japan, 1942–1945* (Lawrence: University Press of Kansas, 1992), 222. For a detailed and sobering examination of the actual US invasion plans, see Thomas B. Allen and Norman Polmar, *Code-Name Downfall: The Secret Plan to Invade Japan and Why Truman Dropped the Bomb* (New York: Simon & Schuster, 1995).

3. Lee, 491; and Richard Overy, *Why the Allies Won* (London: Jonathan Cape, 1995), 301.

4. Drea, 210.

5. "Almanac," *Defense*, September/October 1989, 47. These numbers are probably conservative. For the best discussion of this issue, see D. M. Giangreco, "Casualty Projections for the U.S. Invasions of Japan, 1945–1946: Planning and Policy Implications," *Journal of Military History* 61 (July 1997): 521–82.

6. George Feifer, *Tennozan: The Battle of Okinawa and the Atomic Bomb* (New York: Ticknor & Fields, 1992), 533.

7. The British official history states that 762,736 German civilians starved to death during the war and another 66,466 died of tuberculosis and other lung diseases caused by the lack of fat, oils, and milk in their diets—the absence of which was due to the blockade. A. C. Bell, *A History of the Blockade of Germany, and of the Countries Associated with Her in the Great War: Austria-Hungary, Bulgaria, and Turkey, 1914–1918* (London:

His Majesty's Stationery Office, 1937), 672. The Germans maintained that the number of dead was far higher, but in any event, the total does not include the civilians killed in Austria-Hungary and Turkey, where the effects of the starvation blockade were far more severe.

8. R. J. Rummel, *Death by Government: Genocide and Mass Murder in the Twentieth Century* (New Brunswick, N.J.: Transaction Publishers, 1994), table 8.1, 148.

9. Van Waterford, *Prisoners of the Japanese in World War II* (Jefferson, N.C.: McFarland, 1994), 146. In contrast, the POW death rate in the Nazi prison camps (excluding Soviet prisoners, whose mortality rate was 60 percent) was only 4 percent. Rummel states that 539,000 people died in Japanese prison camps, 13,083 of whom were US and British military POWs (p. 152), whereas Waterford gives a figure of 365,250 dying in Japanese camps. Another source lists the US military POW mortality rate at 34 percent, the Australian at 33 percent, and the British at 32 percent. Gavan Daws, *Prisoners of the Japanese: POWs of World War II in the Pacific* (New York: William Morrow, 1994), 360.

10. US Army Air Forces (AAF), *Mission Accomplished: Interrogations of Japanese Industrial, Military, and Civil Leaders of World War II* (Washington, D.C.: Government Printing Office, 1946), 40. One should also note that Eighth Air Force had changed to B-29s and had recently deployed to air bases on Okinawa. Because of the shorter distances from these bases, versus the distance for

Twentieth Air Force's aircraft based in the Mariana Islands, these planes could carry less fuel and more bombs. Thus, the conventional bomb tonnage dropped on Japan was scheduled to *triple*, beginning in September 1945. United States Strategic Bombing Survey (USSBS), *The United States Strategic Bombing Survey: Summary Report (Pacific)* (Washington, D.C.: Government Printing Office, July 1946), 17.

11. AAF, *Mission Accomplished*, 39.

12. Ibid.

13. USSBS, *The Effects of Strategic Bombing on Japanese Morale* (Washington, D.C.: Government Printing Office, June 1947), 99.

14. "The Emperor's Rescript," *Current History*, September 1945, 191–92.

## Myth 8

> Overall, strategic bombing was a wasted effort that produced only minor effects.*

One could easily make strategic bombing's overall effectiveness in World War II and its decisiveness in victory the subject of several papers, indeed books. Unquestionably, the combined efforts of all the services and all the Allies produced victory. Even so, at the risk of oversimplifying the issue, I offer some more statistics derived from the USSBS and Richard J. Overy's *Why the Allies Won:*

*See, for example, Stephen A. Garrett, *Ethics and Airpower in World War II: The British Bombing of German Cities* (New York: St. Martin's Press, 1993), 161–64, 198; Adm Sir Gerald Charles Dickens, *Bombing and Strategy: The Fallacy of Total War* (London: Sampson Low, 1947), passim; Marshall Andrews, *Disaster through Air Power* (New York: Rinehart, 1950), passim; and Max Hastings, *Bomber Command* (New York: Dial Press, 1979), 346–52.

- By December 1944, the following had occurred:
  - German rail traffic was down 50 percent.[1]
  - Aviation-fuel production was down 90 percent, which in turn caused a catastrophic collapse of the chemical, rubber, and explosive industries as well. Due to the lack of fuel, new German tanks and armored vehicles had to be towed to the front by oxen.[2]
  - Steel production in the Ruhr, Germany's industrial heartland, was down 80 percent.[3]
  - German coal supplies were down 50 percent.[4]
- By mid-1943, Italian industrial production was down 60 percent (Italy soon surrendered, but Germany then occupied the country and continued to fight for another two years).[5]
- The Germans were using 75 percent of their 88s (Germany's best artillery pieces and best tank killers) as anti-aircraft guns.[6]

- AAA absorbed 20 percent of all ammunition produced by Germany, as well as one-third of all optics and more than one-half of all radar and signals equipment. The aluminum used to make AAA shells could have built an additional 40,000 airplanes.[7]
- By D day, defense against Allied air attack absorbed fully one-third of the entire German war economy—a share greater than the entire German economy in June 1941, when Hitler invaded the Soviet Union.[8]
- Two million Germans were engaged in the repair of damaged factories; half a million were trying to move German factories underground; 1 million were assigned to reproduce civilian goods destroyed by air attack; and another million were dedicated to the production and manning of air-defense equipment. (Germany had over 55,000 AAA batteries in 1943.) What if those 4.5 million (20 percent of the German

> work force) had been building tanks or bombers or submarines or, worst of all, had been put in uniform and stationed in France to defend against an Allied invasion?[9]

One should also note that these production losses did not result from German industrial areas being overrun by Allied troops. The Soviets did not capture Silesia until late January 1945, and the Allies neither crossed the Rhine at Remagen until 7 March 1945 nor overran the Ruhr until April 1945. Indeed, the liberation of German-occupied territory resulted in a drop of only 4 percent in German munitions production for all of 1944. In the first quarter of 1945, production fell a further 13 percent due to liberation. In contrast, bombing caused a production drop of triple that amount, and Nazi leaders knew this.[10] In the words of Col-Gen Alfred Jodl, Wehrmacht operations chief, “So I would say that the decisive factor was not so much the very unpleasant effect of your air attacks at the front, as the destruction of the homeland,

almost without resistance."[11] One expert study of the German railway system argues that trains were essential to the entire German economy because they transported the one commodity necessary for all production—coal. Thus, when the strategic air campaign destroyed the railway system, the entire German economy collapsed.[12] Indeed, railways and land transportation in general attracted the most attention from Allied bombers. Of the approximately 2.7 million tons of bombs dropped in the European theater, nearly one-third (31.6 percent) were directed at land-transportation targets.[13]

As for the situation in Japan by July 1945, the USSBS and Overy make the following observations:

- Aluminum production was down to 9 percent of the wartime peak.[14]
- Steel and oil production were down to 15 percent of the wartime peak.[15]
- Production in cities *not bombed* in Japan was at 94 percent of the wartime peak but at 27 percent in cities that *had been bombed*.[16]

- Overall, Japanese production dropped 53 percent between November 1944 and July 1945, prompting the USSBS to state that "by July 1945 Japan's economic system had been shattered. Production of civilian goods was below the level of subsistence. Munitions output had been curtailed to less than half the wartime peak, a level that could not support sustained military operations against our opposing forces. The economic basis of Japan had been destroyed."[17]

This is not to say that airpower alone caused this catastrophic collapse. The US Navy's unrestricted submarine-warfare campaign, as well as the tough ground fighting involving hundreds of thousands of Allied troops, was crucial to ultimate victory.

Regarding costs, the United States spent $183 billion on armaments during World War II, of which the AAF's share amounted to $45 billion (24.6 percent). Of that amount, the AAF spent $9.2

billion on bombers (20.4 percent of the AAF total, 5 percent of the US total). The AAF bought 230,175 aircraft, of which 34,625 were heavy bombers (15 percent); as a percentage of aircraft weight, heavy bombers came to 35 percent of the total.[18] In Britain 50 percent of the defense budget during the war went to the army, 33 percent to the navy, and 17 percent to the RAF—Bomber Command's share was 7 percent.[19] Were the 5 percent spent on bombers by the AAF and the 7 percent by the RAF excessive?

Notes

1. Richard Overy, *Why the Allies Won* (London: Jonathan Cape, 1995), 125.

2. United States Strategic Bombing Survey (USSBS), *Oil Division Final Report* (Washington, D.C.: Government Printing Office, August 1945), 1–3. By late 1944, the lack of synthetic nitrogen, produced as a by-product in the hydrogenation process, was so acute that the Germans filled their artillery shells with 70 percent rock salt.

3. USSBS, *The United States Strategic Bombing Survey: Over-All Report (European War)* (Washington, D.C.: Government Printing Office, 30 September 1945), 37.

4. Overy, 125.

5. Ibid., 129.

6. Ibid.

7. Ibid., 131; Albert Speer, *Inside the Third Reich: Memoirs*, trans. Richard and Clara Winston (New York: Macmillan, 1970), 278–79; and Sebastian Cox, ed., *The Strategic Air War against Germany, 1939–1945* (London: Frank Cass, 1998), xxxiv.

8. Burton Klein, *Germany's Economic Preparations for War* (Cambridge, Mass.: Harvard University Press, 1959), 233.

9. Overy, 129–31; and USSBS, *Over-All Report (European War)*, 37. Of the 1 million personnel manning air-defense batteries, approximately one-fourth were Luftwaffe troops; the remainder were factory workers—termed "pre-military age" youths from 16 to 18 years of age—and Russian prisoners performing menial tasks.

10. Cox, 90, 163.

11. Richard Overy, *Interrogations: The Nazi Elite in Allied Hands, 1945* (London: Allen Lane, 2001), 281.

12. Alfred C. Mierzejewski, *The Collapse of the German War Economy, 1944–1945: Allied Air Power and the German National Railway* (Chapel Hill: University of North Carolina Press, 1988), 184. Mierzejewski affirms this point in *The Most Valuable Asset of the Third Reich: A History of the German Railway System, 1920–1945*, vol. 2 (Chapel Hill: University of North Carolina Press, 1999), 158–61.

13. By way of comparison, other target systems and their percentages of the total tonnage dropped in Europe include the following: oil (8.1 percent),

naval targets (including submarine pens and yards, 4.0 percent), aircraft factories (2.0 percent), and V-weapon sites (1.8 percent). Ball bearings were well down the list with only .25 percent of the total. USSBS, *Statistical Appendix to Over-All Report (European War)* (Washington, D.C.: Government Printing Office, February 1947), 49–59.

14. USSBS, *The United States Strategic Bombing Survey: Summary Report (Pacific)* (Washington, D.C.: Government Printing Office, July 1946), 18.

15. Ibid.

16. USSBS, *The Effects of Strategic Bombing on Japan's Urban Economy* (Washington, D.C.: Government Printing Office, March 1947), 11.

17. USSBS, *The Effects of Strategic Bombing on Japan's War Economy* (Washington, D.C.: Government Printing Office, December 1946), 2.

18. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II,* vol. 6, *Men and Planes* (1955; new imprint, Washington, D.C.: Office of Air Force History, 1983), 360; and I. B. Holley Jr., *Buying Aircraft: Materiel Procurement for the Army Air Forces* (Washington, D.C.: Office of the Chief of Military History, Department of the Army, 1964), 550.

19. Cox, xxv.

# Myth 9

Airpower was a failure in Vietnam, losing the war and letting the Army down. Why even have an Air Force if it can't beat a fourth-rate power like North Vietnam?*

Like World War II, the Vietnam War has engendered much emotion and misunderstanding, although the great

*See, for example, Jeffrey Record, "Into the Wild Blue Yonder: Should We Abolish the Air Force?" *Foreign Policy* 52 (spring 1990): 50–54; and Col Thomas Garrett, "Close Air Support: Which Way to Go?" *Parameters* 20 (December 1990): 29–43. After accusing the Air Force of being insufficiently supportive of close air support for decades, Garrett concludes his diatribe with, "Come on Air Force! Get down, get funky!" See also George and Meredith Friedman, *The Future of War: Power, Technology, and American World Dominance in the 21st Century* (New York: Crown Publishers, 1996), especially chap. 10, "Vietnam and the Failure of Airpower"; and Earl H. Tilford Jr., *Crosswinds: The Air Force's Setup in Vietnam* (College Station, Tex.: Texas A&M University Press, 1993). Tilford's thesis maintains that the Air Force "failed" in Vietnam because it "fell victim to its own brief history and to the unswerving commitment of its leadership to the dubious doctrine of strategic bombing" (xviii).

successes of airpower in the Persian Gulf War and the years since have muted a great deal, but not all, of such talk. Attacks on airpower's performance in Vietnam continue.

During the Vietnam War, 8.7 million Americans served in uniform. Of those, 4.4 million were in the Army, 1.8 million in the Navy, 1.7 million in the Air Force, and nearly 800,000 in the Marines. In addition, at any one time nearly 1 million South Vietnamese soldiers—including regulars, reserves, and provincial troops—served their country. At the same time, the allied countries of Thailand, the Republic of Korea, Australia, and New Zealand had as many as 70,000 ground troops in South Vietnam.[1] In 1967 over 1.3 million allied ground troops operated in South Vietnam—a country the size of Wisconsin. Yet, even all those soldiers and marines could not control the countryside. During this period, at the time of our greatest ground presence, we failed to detect, much less prevent, the massive Vietcong ground offensive during the Vietnamese Tet (New Year) holidays

of 1968. If the Air Force, with its 1.7 million personnel, failed in Vietnam, then the 9 million military personnel of the other services and South Vietnam failed even more dismally.

Moreover, it is important to note who was in charge of US political and military strategy during this war. From 1963 to 1973, 20 men occupied seven positions of key leadership (table 4).

Of these 20 leaders, only one—Robert S. McNamara—had served in the Air Force (as a staff officer in the AAF). Ten others (counting Taylor twice) had been or were still in the Army; nine others, including all three presidents, were or had been Navy officers; and one, Ambassador Ellsworth Bunker, had no military experience.[2] Furthermore, during the Rolling Thunder air campaign against North Vietnam from 1965 to 1968, the strategy, targets, and often even the tactics, were determined during Tuesday lunch meetings in the White House. No airman ever received an invitation to those meetings. Gen Earle G. Wheeler, an infantryman,

**Table 4**
**Key US Leaders during the Vietnam War**

| | | |
|---|---|---|
| *Presidents* | | |
| John F. Kennedy | 1961–63 | Navy officer in WWII |
| Lyndon B. Johnson | 1963–69 | Navy officer in WWII |
| Richard M. Nixon | 1969–73 | Navy officer in WWII |
| *National Security Advisors* | | |
| McGeorge Bundy | 1961–66 | Army officer in WWII |
| Walt W. Rostow | 1966–69 | Army officer in WWII |
| Henry M. Kissinger | 1969–73 | Army NCO in WWII |
| *Secretaries of Defense* | | |
| Robert S. McNamara | 1961–68 | AAF officer in WWII |
| Clark M. Clifford | 1968–69 | Navy officer in WWII |
| Melvin C. Laird | 1969–73 | Navy officer in WWII |
| *Chairmen, JCS* | | |
| Maxwell D. Taylor | 1962–64 | Army officer |
| Earle G. Wheeler | 1964–70 | Army officer |
| Thomas H. Moorer | 1970–74 | Navy officer |
| *Theater Commanders (Pacific Command)* | | |
| Harry D. Felt | 1958–64 | Navy officer |
| U.S. Grant Sharp | 1964–68 | Navy officer |
| John S. McCain Jr. | 1968–72 | Navy officer |
| *Subtheater Commanders (US Military Assistance Command, Vietnam)* | | |
| Paul D. Harkins | 1960–64 | Army officer |
| William C. Westmoreland | 1964–68 | Army officer |
| Creighton W. Abrams | 1968–72 | Army officer |
| *Ambassadors to South Vietnam* | | |
| Henry Cabot Lodge | 1960–64 | Army officer in WWII |
| Maxwell D. Taylor | 1964–65 | Army officer |
| Ellsworth Bunker | 1965–73 | No military experience |

attended instead and purportedly gave "the air point of view."[3]

There is much blame to go around regarding how we planned and fought the Vietnam War, and airmen must share responsibility for defeat. But airpower played only one small part of a fatally flawed strategy, and airmen had virtually no direct role in formulating that strategy. It is also noteworthy that the most vocal military critic of our Vietnam War policy at the time was Gen Curtis E. LeMay, the Air Force chief of staff. For his pains, he was forced into early retirement.[4]

As for letting the Army down, the Air Force flew 3.9 *million* combat air sorties in South Vietnam in support of the Army; of those, 633,180 were "attack" sorties, including 67,477 B-52 strikes, each delivering up to 30 tons of bombs (table 5).[5] Gen William Westmoreland, commander of US Military Assistance Command, Vietnam (MACV) from 1964 to 1968, believed that Vietnam was primarily a ground war and that the purpose of airpower was to support the ground effort. He therefore sought control of all air

**Table 5**
**USAF Combat Sorties in South Vietnam**

| *Year* | *Tacair* | *Gunship* | *B-52* | *Escort* | *Recce* | *Helo* | *Other* | *Total* |
|---|---|---|---|---|---|---|---|---|
| **1962** | 1,589 | | | 745 | 591 | | 12,921 | 15,846 |
| **1963** | 4,015 | | | 1,865 | 3,045 | | 21,568 | 30,493 |
| **1964** | 2,718 | 15 | | 1,604 | 7,939 | | 39,755 | 52,031 |
| **1965** | 36,023 | 276 | 1,538 | 1,785 | 26,755 | | 93,579 | 159,956 |
| **1966** | 69,610 | 1,036 | 4,307 | 5,804 | 61,419 | | 239,181 | 381,357 |
| **1967** | 111,704 | 4,856 | 6,609 | 6,115 | 94,748 | 616 | 474,082 | 698,730 |
| **1968** | 129,896 | 4,994 | 16,505 | 2,969 | 82,385 | 7,446 | 595,922 | 840,117 |
| **1969** | 91,796 | 4,726 | 11,494 | 2,017 | 129,022 | 6,564 | 521,223 | 766,844 |
| **1970** | 46,171 | 1,893 | 3,697 | 343 | 69,674 | 5,829 | 398,640 | 526,247 |
| **1971** | 11,758 | 84 | 2,386 | 20 | 27,139 | 6,221 | 237,876 | 285,484 |
| **1972** | 38,031 | 3,070 | 19,289 | 1,046 | 12,191 | 750 | 70,010 | 144,387 |
| **1973** | 1,246 | 194 | 1,652 | 249 | 1,164 | | 5,008 | 9,513 |
| **Total** | 544,557 | 21,144 | 67,477 | 24,562 | 516,072 | 27,426 | 2,709,765 | 3,911,005 |

*Source:* "USAF Combat Sorties in Southeast Asia, January 1962 thru December 1973" (chart) (Washington, D.C.: Headquarters United States Air Force/XOOCOAB, 5 April 1974).

assets operating in Southeast Asia, but these efforts were rebuffed by his superior in Hawaii, Adm U. S. Grant Sharp, who insisted on retaining control of the air war against North Vietnam. Nonetheless, Westmoreland determined the targets in South Vietnam for Air Force, Navy, Marine, and Army aircraft—including the tens of thousands of B-52 Arc Light strikes, usually directed against "suspected enemy locations." In a compromise worked out with Sharp, Westmoreland also chose the targets in Route Package 1—the area just north of the demilitarized zone.

The Air Force had only token representation on the MACV staff, despite the fact that a full general—the commander of Seventh Air Force—was Westmoreland's "air deputy." When Seventh Air Force aircraft went north of "Route Pack" 1, the targets came from Headquarters Pacific Command in Hawaii (after approval in Washington). The Seventh had no control over Navy, Army, Marine, or South Vietnamese aircraft operating in South Vietnam.[6] During the siege of

Khe Sanh in 1968, Gen William Momyer, the Seventh Air Force commander, pushed for control of all air assets in South Vietnam so as to protect the beleaguered marines most effectively. Washington initially denied such control even though Westmoreland strongly supported it; only a decision by the secretary of defense to consolidate airpower under a single air commander—temporarily—allowed the use of a system that put the lives of the troops under fire above the parochial interests of the services.[7]

After the war, a retired Army general with a PhD in political science wrote to his colleagues who had served in command positions in Vietnam, asking them to complete a survey on their experiences in the war. Of the 173 Army general officers still alive, 67 percent responded. When asked what they thought of the close air support provided to them in Vietnam, 64 percent said it was "about right." More interesting, 28 percent said it was "too much considering the nature of the war."[8] Indeed, one general maintained that the excessive amount of air

support seriously derogated the infantry's traditional doctrine of closing with the enemy. Instead, the infantry would locate the enemy, back off, and call in an air strike. He concluded that the Army needed to be weaned away from its overreliance on airpower.[9] Another survey question concerned relations with the other services. Sixty percent of the Army generals characterized their relations with the Air Force as "outstanding," and only 2 percent said it was "not satisfactory."[10]

## Notes

1. "Almanac," *Defense*, September/October 1989, 47; Guenter Lewy, *America in Vietnam* (New York: Oxford University Press, 1978), 455; Harry G. Summers Jr., *Historical Atlas of the Vietnam War* (Boston: Houghton Mifflin, 1995), 169; and Frances FitzGerald, *Fire in the Lake: The Vietnamese and the Americans in Vietnam* (Boston: Little, Brown, 1972), 342.

2. Walt Rostow was an unusual case. As an Army major in the Office of Strategic Services (OSS), he was assigned to the Economic Objectives Unit in London, where he studied the German economy to determine appropriate targets for Allied strategic

bombers. In addition, Admirals Felt and Moorer were aviators.

3. Wayne Thompson, *To Hanoi and Back: The U.S. Air Force and North Vietnam, 1966–1973* (Washington, D.C.: Smithsonian Institution Press, 2000), 23–24. President Johnson once boasted that "they can't even bomb an outhouse without my approval." Gen William C. Westmoreland, *A Soldier Reports* (Garden City, N.Y.: Doubleday, 1976), 119.

4. Thompson, 21. Most Air Force chiefs serve a four-year tour, although two (Hoyt Vandenberg and John McConnell) served longer. George Brown left after one year when he was elevated to chairman of the JCS; Mike Dugan was relieved after less than four months in office for his intemperate remarks in the months before the Persian Gulf War; and Ron Fogleman retired in protest after three years due to the handling of the Khobar Towers terrorist attack. LeMay lasted three-and-one-half years.

5. Most of the Air Force's Medal of Honor recipients in Vietnam (seven of 13) received the award for actions taken in support of ground forces.

6. Dr. Graham A. Cosmas, "General Westmoreland and Control of the Air War," in Naval Historical Center, *Command and Control of Air Operations in the Vietnam War: Colloquium on Contemporary History, January 23, 1991* (Washington, D.C.: Naval Historical Center, Department of the Navy, 1991), 29–38, on-line, Internet, 3 September 2003, available from http://members.salts.navy.mil/vtu0615/vtu615cch4.html#General; and Thompson, 14–19. Momyer was opposed to the Army's targeting of the B-52s, arguing that such missions were wasteful

and indiscriminate. His arguments were waved aside: "Westmoreland's zeal for Arc Light strikes remained undiminished despite Air Force objections and a paucity of measurable results." John Schlight, *A War Too Long: The USAF in Southeast Asia, 1961–1975* (Washington, D.C.: Air Force History and Museums Program, 1996), 31.

7. Willard J. Webb, "The Single Manager for Air in Vietnam," *Joint Force Quarterly* 1 (winter 1993/1994): 88–98. The concept of a joint air component commander is now codified in US joint military doctrine.

8. Brig Gen Douglas Kinnard, *The War Managers* (Hanover, N.H.: University Press of New England, 1977), 47.

9. Lt Gen Dave Richard Palmer, *Summons of the Trumpet: US—Vietnam in Perspective* (San Rafael, Calif.: Presidio Press, 1978), 143–46. Palmer referred to this problem as "firebase psychosis."

10. Kinnard, 63. In contrast, only 29 percent of the Army generals rated their relations with the Navy as "outstanding"; with the Marines, it was even worse: 22 percent thought them "outstanding."

# Myth 10

Strategic bombing failed in Vietnam because Rolling Thunder did not break the will of Ho Chi Minh and his cohorts to continue the war in the south.*

Rolling Thunder, the air campaign against North Vietnam that lasted from 1965 to 1968, did not involve strategic bombing. Rather, it was an interdiction campaign—and a halfhearted one at that. Approximately 90 percent of all targets struck during Rolling Thunder were transportation-related—most of them located south of the 20th parallel, well below the industrial and transportation

*See, for example, John Prados, *The Hidden History of the Vietnam War* (Chicago: Ivan R. Dee, 1995), 180–92; Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, N.Y.: Cornell University Press, 1996), 174–210, 316–26; and William Shawcross, *Sideshow: Kissinger, Nixon, and the Destruction of Cambodia* (New York: Simon and Schuster, 1979), 209–19.

centers of Hanoi and Haiphong. Because the latter—North Vietnam's major port through which it received 85 percent of all supplies—was not closed by mining until 1972, US forces could not halt supplies near their source. Indeed, both cities usually remained off-limits to bombing during Rolling Thunder and had restricted zones placed around them—up to 30 miles for Hanoi and 10 miles for Haiphong. Furthermore, 16 bombing halts occurred between 1965 and 1968. Finally, even though a principle of air war concerns the necessity of achieving air superiority as a first priority (without it, air operations become far more difficult), the administration would not allow attacks on North Vietnamese airfields until April 1967—more than two years after the start of the Rolling Thunder campaign.[1] In addition, surface-to-air missile (SAM) sites were often off-limits to American air strikes—unless and until those sites took hostile action against our aircraft.

When the administration first discussed US air strikes in November 1964, the North Vietnamese had no jet aircraft,

no SAMs, around 20 air-defense radars, and perhaps 1,500 AAA guns. By February 1965, the North Vietnamese had 60 MiGs, and the number of air-defense radars and AAA sites had doubled. They were also being supplied with SAMs. The first US loss to a MiG occurred in April 1965, and the first aircraft lost to a SAM in July. Eventually, nearly 1,000 US aircraft and 800 crewmen were lost over North Vietnam, many because the rules of engagement had placed airfields, radars, and SAM sites off-limits.[2]

In mid-to-late 1964, the JCS proposed various plans that included a series of air strikes against 94 key targets in North Vietnam, to be conducted over a period of 16 days; the strike aircraft would include B-52s. In addition, the JCS (note that these were joint, not Air Force, plans) also proposed the blockade of North Vietnam and the mining of Haiphong harbor, as well as the introduction of US ground troops into South Vietnam to combat the insurgency. The administration rejected these plans.[3]

Eventually, US aircraft hit most of the 94 targets but did so over a period of three years—not the 16 days called for by the JCS. A tenet of airpower doctrine calls for the quick and powerful application of force. A campaign of gradual escalation robs airpower of both its physical and psychological impact. Indeed, such piecemeal attacks generally prove counterproductive. This tenet, however, was ignored. One cannot assume that the JCS plans would have been successful if they had been approved and implemented. Rather, one can only note that the plans submitted by the country's top military experts were rejected. Certainly, President Lyndon Johnson had cogent political reasons for ignoring the advice of his top military advisors—his fear of Chinese intervention, for example. The result, nonetheless, made it extremely difficult to devise options that could both navigate political shoals and provide military success. The options actually implemented were failures.

US forces attempted strategic bombing against North Vietnam just once—during

the 11-day Linebacker II air campaign of December 1972, when B-52s struck targets in and around Hanoi and Haiphong in a series of massive raids. Linebacker II did not "win the war" for the United States and South Vietnam, but it did force the North Vietnamese government to return to the negotiating table and sign an agreement that both parties had agreed to "in principle" but had not signed two months before. At the same time, Linebacker II reassured the South Vietnamese government—erroneously as it turned out—that the United States remained committed to that regime's continued survival.

People still debate whether or not Linebacker II coerced the North Vietnamese into signing an agreement. Although the December settlement resembled the one negotiated two months earlier, Hanoi's leaders did not *sign* that accord. It is impossible to know if they would have done so without the Christmas bombing. Note the remarks of two expert observers regarding the significance of those attacks:

- Vice Adm James B. Stockdale, POW and Medal of Honor winner: "One look at any Vietnamese officer's face told the whole story. It telegraphed hopelessness, accommodation, remorse, fear. The shock was there; our enemy's will was broken."[4]
- Adm Thomas H. Moorer, chairman of the JCS, 1973: "I am convinced that Linebacker II served as a catalyst for the negotiations which resulted in the cease fire. Air power, given its day in court after almost a decade of frustration, confirmed its effectiveness as an instrument of national power—in just nine and a half flying days."[5]

Notes

1. Wayne Thompson, *To Hanoi and Back: The U.S. Air Force and North Vietnam, 1966–1973* (Washington, D.C.: Smithsonian Institution Press, 2000), 63. There was also a buffer zone 30 nautical miles deep along the Chinese border that US aircraft could not violate.

2. Marshall L. Michel III, *Clashes: Air Combat over North Vietnam, 1965–1972* (Annapolis: Naval

Institute Press, 1997), 7–8, 29, 32, 41; and Craig C. Hannah, *Striving for Air Superiority: The Tactical Air Command in Vietnam* (College Station, Tex.: Texas A&M University Press, 2002), passim.

3. John P. Glennon, ed., *Foreign Relations of the United States, 1964–1968,* vol. 1, *Vietnam, 1964* (Washington, D.C.: Government Printing Office, 1992), 112–18, 713–17, 847–57. For background on these plans, see Jacob Van Staaveren, *Gradual Failure: The Air War over North Vietnam, 1965–1966* (Washington, D.C.: Air Force History and Museums Program, 2002), chap. 2.

4. Jim and Sybil Stockdale, *In Love and War* (New York: Harper & Row, 1984), 432.

5. Adm Thomas H. Moorer, "The Decisiveness of Airpower in Vietnam," Air Force Policy Letter for Commanders, supp. no. 11 (November 1973), 9, quoted in *The Linebacker Raids: The Bombing of North Vietnam, 1972* by John T. Smith (Wellington House, London: Arms & Armour Press, 1998), 174.

# Myth 11

Airpower was an indiscriminate weapon that killed excessive numbers of Vietnamese civilians.*

Sen. George McGovern called the Linebacker II campaign of December 1972 "the most murderous aerial bombardment in the history of the world." Tom Wicker, a *New York Times* writer, termed it "a holocaust," and Anthony Lewis, another *New York Times* reporter, labeled it "a crime against humanity." In truth, however, even Hanoi admitted that the strikes caused only 1,623 deaths in Hanoi and Haiphong—a remarkably small toll, given the intensity of the air campaign.[1]

---

*See, for example, Gabriel Kolko, *Anatomy of a War: Vietnam, the United States, and the Modern Historical Experience* (New York: Pantheon Books, 1985), 441; Erwin Knoll and Judith Nies McFadden, eds., *War Crimes and the American Conscience* (New York: Holt, Rinehart and Winston, 1970), 55–61; and Raphael Littauer and Norman Uphoff, eds., *The Air War in Indochina* (Boston: Beacon Press, 1972), passim.

Guenter Lewy has provided the most authoritative casualty statistics available on the Vietnam War—although he admits that these numbers are estimates. Around 587,000 North and South Vietnamese civilians were killed in the fighting. Of those, 39,000 were assassinated by the Vietcong and another 65,000 died in US bombing operations over North Vietnam. Therefore most of those who died—483,000—were killed in South Vietnam as a result of fighting between the Vietcong and North Vietnamese army on one side, and the South Vietnamese army and US forces on the other. Trying to determine the cause of death is difficult, but based on the number of people admitted to hospitals in South Vietnam between 1967 and 1970, Lewy estimates that 66.5 percent of all injuries resulted from mines, mortars, guns, and grenades. The other 33.5 percent were injured by shelling or bombing. *If* we use these percentages for the entire war, and *if* we assume that the number of individuals injured by shelling or bombing is equal (Lewy doesn't break

this category down), and *if* we assume that those killed met their fates in the same percentages as did those who were wounded (and all of those assumptions are big *if*s), then of the 587,000 Vietnamese civilians, both North and South Vietnamese, that Lewy states were killed during the war, around 146,000 (25 percent) died from air attacks. The other 75 percent—over 440,000 people—were killed by either ground or naval action.[2]

When General Westmoreland was asked what would provide an answer to the insurgency in South Vietnam, he replied simply, "Firepower."[3] The US Army declared certain areas in South Vietnam "free fire zones" open to unrestricted use of artillery and mortar fire: "anything that moved could be killed and anything that stood could be leveled."[4] While US and South Vietnamese aircraft dropped five million tons of ordnance on South Vietnam, the Army and Marine Corps shot *eight* million tons of artillery rounds there.[5] Except during the Tet offensive of 1968, situations of light or inactive combat accounted for

70 percent of all US artillery rounds fired—referred to as "harassment and interdiction" fire.[6] For example, the policy of Maj Gen Ellis Williamson, commander of the 25th Infantry Division, called for shooting 1,000 rounds of artillery for every one received by the enemy. One is moved to ask at exactly what these 1,000 rounds were aimed. Interestingly, the Vietcong used the 27,000 tons of dud artillery rounds fired by the Army and Marines to build booby traps that caused 6,000 US casualties in the first half of 1967 alone.[7] A great deal of fire and steel rained down on South Vietnam, but aircraft did not drop the majority of it.

Notes

1. Martin F. Herz, assisted by Leslie Rider, *The Prestige Press and the Christmas Bombing, 1972: Images and Reality in Vietnam* (Washington, D.C.: Ethics and Public Policy Center, 1980), 42, 47; and Guenter Lewy, *America in Vietnam* (New York: Oxford University Press, 1978), 451. Given that McGovern had piloted B-24s over Europe during World War II, this is a pretty remarkable statement.

2. Lewy, 442–51.

3. Col Andrew F. Krepinevich Jr., *The Army and Vietnam* (Baltimore: Johns Hopkins University Press, 1986), 197.

4. Neil Sheehan, *A Bright Shining Lie: John Paul Vann and America in Vietnam* (New York: Random House, 1988), 540. Officially, the Army euphemistically termed these "specialized strike zones."

5. Wayne Thompson, *To Hanoi and Back: The U.S. Air Force and North Vietnam, 1966–1973* (Washington, D.C.: Smithsonian Institution Press, 2000), 5–6.

6. Krepinevich, 201.

7. This number represented 17 percent of all US casualties during that period. Micheal [*sic*] Clodfelter, *Vietnam in Military Statistics: A History of the Indochina Wars, 1772–1991* (Jefferson, N.C.: McFarland, 1995), 232; and Krepinevich, 201. The US Army shot 20 million artillery rounds in South Vietnam.

# Myth 12

> Too focused on strategic attack during the Persian Gulf War, the Air Force provided inadequate support to ground forces.*

Despite the success of US forces in Operation Desert Storm and thereafter, criticisms of airpower continue. Several additional charges bear this out.

Strategic attack made up only a small part of the coalition air campaign (table 6). In fact, the air tasking order that codes

---

*See, for example, Richard M. Swain, *Lucky War: Third Army in Desert Storm* (Fort Leavenworth, Kans.: US Army Command and General Staff College Press, [1994]), 181–82, 185; Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, N.Y.: Cornell University Press, 1996), 211–53, 316–26; Capt Michael Ott, "Aviation: It's about Support," US Naval Institute *Proceedings* 118 (November 1992): 112; Brig Gen Robert H. Scales Jr., *Certain Victory* (Washington, D.C.: Office of the Chief of Staff, US Army, 1993), 178–81, 187–89; and Jeffrey Record, *Hollow Victory: A Contrary View of the Gulf War* (Washington, D.C.: Brassey's, 1993), 103–18.

**Table 6**
**Persian Gulf War:**
**Sorties Flown by US Service/Total, by Mission Type**

| *Mission Type* | *Air Force* | *Navy* | *Marines* | *SOCCENT* | *Army* | *Total* |
|---|---|---|---|---|---|---|
| **Interdiction** | 24,292 | 5,060 | 4,264 | 32 | 0 | 38,277 |
| **CAS** | 2,120 | 21 | 3,956 | 31 | 0 | 6,128 |
| **CAP** | 4,558 | 4,245 | 0 | 0 | 0 | 13,075 |
| **OCA** | 6,422 | 1,936 | 757 | 0 | 0 | 10,670 |
| **Airlift** | 16,628 | 0 | 9 | 19 | 201 | 22,064 |
| **Recce** | 1,311 | 1,431 | 3 | 2 | 147 | 3,236 |
| **Refueling** | 11,024 | 2,782 | 461 | 56 | 0 | 15,895 |
| **SOF** | 134 | 3 | 1 | 808 | 0 | 948 |
| **Support** | 203 | 41 | 714 | 64 | 0 | 1,071 |
| **EW** | 1,578 | 265 | 343 | 84 | 568 | 2,918 |
| **$C^3$** | 604 | 1,143 | 157 | 0 | 0 | 1,989 |
| **Training** | 174 | 262 | 14 | 76 | 0 | 686 |
| **Surface CAP** | 0 | 198 | 0 | 0 | 0 | 238 |
| **Other** | 358 | 916 | 4 | 90 | 0 | 1,466 |
| **Total** | 69,406 | 18,303 | 10,683 | 1,262 | 916 | 118,661 |

*Source:* Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey,* vol. 5, *A Statistical Compendium and Chronology* (Washington, D.C.: Department of the Air Force, 1993), 232–33. Note: The difference in numbers of sorties flown by US services and those in the "total" column on the right reflects the sorties flown by coalition partners. SOCCENT=Special Operations Component, Central Command; CAS=close air support; CAP=combat air patrol; OCA=offensive counterair; SOF=special operations forces; EW=electronic warfare; $C^3$=command, control, and communications.

all air missions by type does not even have a "strategic attack" category. Thus, missions that struck chemical-weapons bunkers in northern Iraq or an electrical power plant in Baghdad were coded as "air interdiction."[1] Such a classification system seems incongruous if airmen really wished to emphasize strategic attack as their primary mission.

Even so, some targets were unofficially considered as having a strategic nature: leadership (especially telecommunications); key production facilities (electricity and oil); transportation infrastructure (railroads and bridges); and nuclear, biological, and chemical research, production, and storage facilities. Using these categories, one finds that of the 41,039 strike sorties flown by coalition aircraft, only 5,692 (13.9 percent) would be classified as "strategic."[2] Moreover, because heavy bombers like the B-52 dropped a disproportionate share of the bomb tonnage during the war (32 percent) and because almost all of those strikes went against the Iraqi army, the vast majority

of all bombs fell on enemy ground forces and their equipment.[3]

One must also consider the weight of ordnance actually falling on Baghdad—the epitome of a strategic center of gravity. In 43 days, US forces delivered a mere 330 weapons (244 laser-guided bombs and 86 Tomahawk cruise missiles) against Baghdad targets. Those weapons represented 3 percent of all the precision ordnance used during the war, which in turn amounted to 7.4 percent of all the air weapons expended. As a consequence, the total tonnage falling on Baghdad during the war amounted to a scant 287 tons—a minute fraction of the total of 84,200 tons dropped by the Air Force.[4]

This massive air campaign directed against the Iraqi ground forces had an enormous effect. US Central Command wanted airpower to attrit all Iraqi front-line divisions below 50 percent of their assumed combat strength in tanks, artillery, and armored vehicles before ground operations began. The command's intelligence determined that

airpower had indeed met this goal by 24 February 1991; in addition, it had reduced rear divisions by 25 percent. Detailed examinations by US intelligence agencies after the war confirmed these percentages. Given that a military unit becomes "combat ineffective" when it has lost 40 percent of its strength, it is small wonder that over 80,000 Iraqi soldiers deserted during the aerial pounding and another 86,000 surrendered virtually without a fight.[5]

Charges of an Air Force focus on strategic attack to the detriment of support of ground forces continued after the Gulf War.[6] Actually, the weight of the air effort directed at enemy ground forces remains extremely high. In Operation Iraqi Freedom in 2003, coalition aircraft attacked nearly 20,000 discrete targets, 79 percent of them Iraqi military units and equipment (fig. 2). The next highest category struck was Iraqi command and control targets, which attracted 9 percent of the strikes.[7]

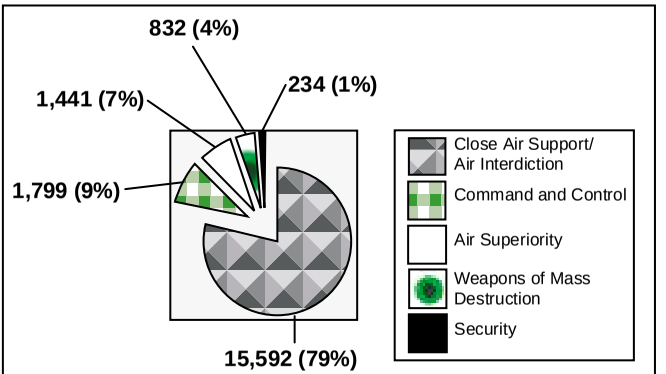



**Figure 2. Targets Struck by Category (Number and Percentage) in Operation Iraqi Freedom** (From "Operation Iraqi Freedom—By the Numbers" [Shaw AFB, S.C.: US Central Command Air Forces (CENTAF), 30 April 2003], 5)

In truth, airpower now dominates the way the United States fights. The aircraft carrier is the backbone of the fleet, and the F/A-18 Superhornet program will cost $47 billion. The Army spends more on aircraft and missiles than it does on tracked vehicles, and its plans for upgrading or buying helicopters—the Black Hawk, Apache, and Comanche—total nearly $70 billion. The Marine Corps's top funding priority is the tilt-rotor V-22 cargo/assault plane, costing over $85 million each.[8] The Marine Corps is also pushing for a vertical takeoff and landing version of the Joint Strike Fighter to replace its aging AV-8 Harriers. In short, all the services recognize the dominance of airpower in both their operations and their budgets. The major debates occur over who will control those air assets. In essence, the air arms of each of our services are greater than the total air assets of virtually every country in the world (fig. 3).[9]

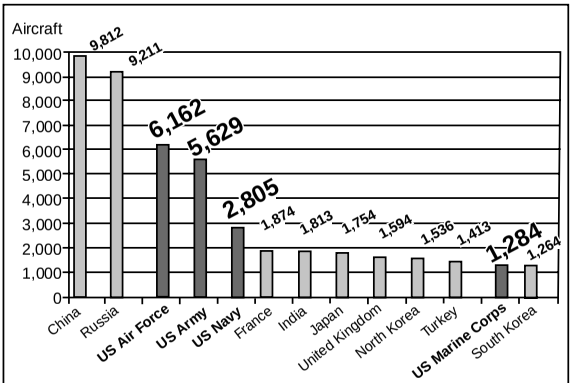



**Figure 3. US Airpower versus the World** (From "World Military Aircraft Inventory," *Aviation Week and Space Technology,* 13 January 2003, 257–76. These figures reflect all military aircraft.)

## Notes

1. Eliot Cohen, ed., *Gulf War Air Power Survey (GWAPS),* vol. 5, *A Statistical Compendium and Chronology* (Washington, D.C.: Department of the Air Force, 1993), 227.

2. Ibid., 418.

3. Eliot Cohen and Thomas A. Keaney, *Gulf War Air Power Survey (GWAPS): Summary* (Washington, D.C.: Department of the Air Force, 1993), 15.

4. William M. Arkin, "Baghdad: The Urban Sanctuary in Desert Storm?" *Airpower Journal* 11 (spring 1997): 5–6; and *GWAPS: Summary,* 226.

5. *GWAPS: Summary,* 105–6.

6. Robert Coram, "The Hog That Saves the Grunts," *New York Times,* 27 May 2003, A25.

7. "Operation Iraqi Freedom—By the Numbers" (Shaw AFB, S.C.: US Central Command Air Forces [CENTAF], 30 April 2003), 5.

8. Center for Defense Information, "Fiscal Year 2003 Budget: FY '03 Request for Selected Weapons Systems" (Washington, D.C.: Center for Defense Information, 4 February 2002); and John R. Guardino, "Outlook 2001: The Military's Manifest Destiny," *Rotor and Wing* 35 (January 2001): 20–25. In October 2002, the Defense Department decided to cut the proposed Comanche buy nearly in half, thus saving about $10 billion from the total program—although the unit cost is thereby driven up to $60 million. But the money thus "saved" will be used to further upgrade the Apaches in the Army's inventory. Robert Wall, "New Comanche Plan Gets

Green Light," *Aviation Week and Space Technology*, 28 October 2002, 27–30.

9. The actual superiority is even greater than apparent. Qualitatively, US airpower far outstrips anything else in the world. Specifically, although the Chinese have many airframes, over half are Vietnam-era MiG-19s and -21s. Due to severe budget constraints over the past decade, even Russia is unable to keep most of its air force operational or its pilots proficient.

# Myth 13

Air attack is nothing more than "recreational bombing"; pilots fly so high they can't possibly hit their targets accurately.*

In operations such as the war with Serbia to free Kosovo in 1999, political leaders deemed it fundamental that North Atlantic Treaty Organization (NATO) casualties be kept to an absolute minimum.[1] The alliance, shaky from the start, undoubtedly would have split if it had sustained heavy casualties. Hence, early on, President Bill Clinton and

*See, for example, Jeffrey L. Gingras and Tomislav Z. Ruby, "Morality and Modern Air War," *Joint Force Quarterly* 7 (summer 2000): 107–11. See also endnote no. three. The term *recreational bombing* was used by an officer at a US war college where I was conducting a seminar. During his campaign for the presidency in 2000, Sen. John McCain, who had been a Navy pilot in Vietnam, stated that it was "immoral" for NATO pilots to drop ordnance from above 15,000 feet. McCain had never employed precision-guided weapons and was obviously unaware of the parameters necessary for their accurate delivery.

NATO leaders declared a ground invasion out of the question. The number of personnel involved (Gen Hugh Shelton, JCS chairman, stated that as many as 200,000 troops would be necessary), combined with the memories of vicious fighting in the Serbian mountains during World War II, indicated that an invasion would mean heavy losses for NATO as well as massive casualties and collateral damage for the Serbs.[2] Instead, alliance forces would use airpower as the weapon of first resort. Yet, the need to limit casualties on both sides remained a primary consideration for NATO leaders.

As a consequence, allied aircraft had orders to remain at medium altitude—usually above 15,000 feet—so as to stay above the range of most enemy ground fire. Some critics argued that this policy induced inaccurate bombing, thus increasing collateral damage and civilian casualties. For example, Sen. Dianne Feinstein commented, "I don't believe you can win wars by tossing bombs around like popcorn." Writer Norman Mailer said that bombing without putting airmen at

serious risk is "obscene." And former president Jimmy Carter stated that the bombing in Kosovo was "senseless and excessively brutal."[3]

These people were either misinformed or, more accurately, uninformed. A precision-guided munition (PGM) is most accurate when dropped from midaltitude—15,000 to 23,000 feet—which allows enough time for the weapon to correct itself in flight. If dropped from a lower altitude, the weapon will have less kinetic energy and its steering fins less opportunity to correct the aim; thus, the weapon will usually land short of the target. From the pilot's perspective, medium altitude allows time to identify the target at sufficient distance, "designate" it (if laser guided), and launch the weapon. In short, for PGMs delivered on a fixed target with an established position—true of most of the targets struck in Serbia—the optimum altitude to ensure accuracy lies at or above 15,000 feet.

The most favorable drop altitude for the accurate employment of nonguided munitions is lower than that for a PGM. Even

so, target acquisition remains a limiting factor: coming in too low at 500 knots makes it nearly impossible to acquire the target, line up the aircraft, and place the bomb accurately. As a result, the compromise altitude for the delivery of unguided bombs is around 5,000 feet. However, flying at this altitude places the delivery aircraft right in the thick of ground fire. Commanders in Operation Allied Force resolved this dilemma by keeping aircraft at medium altitudes but restricted the use of non-PGMs to areas where the risk of civilian casualties or collateral damage was minimal or nonexistent.

Difficulty arises in identifying and attacking mobile targets. On 14 April 1999, near Korisa, Kosovo, NATO pilots attacked what intelligence sources had identified as—and which indeed appeared to be—a military column. We now know that the column also contained civilian refugees, several dozen of whom died in the air strikes.[4] This is the only instance in the 78-day air campaign when NATO intelligence sources and aircraft at medium altitude combined to misidentify a target,

thereby causing civilian casualties. Could the aircraft have avoided this accident if they had flown at a lower altitude? Probably. Indeed, NATO changed the rules after this incident, allowing aircraft in certain circumstances to fly lower to ensure target identification. Such instances, however, involve a trade-off: if flying lower increases the risk to aircrews due to enemy ground fire, at what point does the risk of misidentifying a target override the risk of losing a plane and its crew? If friendly losses meant the shattering of the alliance, were they preferable to allowing Slobodan Milosevic to continue his atrocities unchecked?

Notes

1. Gen Wesley K. Clark, *Waging Modern War: Bosnia, Kosovo, and the Future of Combat* (New York: Public Affairs, 2001), 183.

2. John F. Harris, "Advice Didn't Swing Clinton on Airstrikes," *Washington Post*, 1 April 1999, A1, A20; and Johanna McGeary, "It's Flight or Fight," *Time*, 3 May 1999, 56. The French and German governments,

who estimated that a ground invasion would require 500,000 troops, were adamantly opposed to such a massive operation. Sebastian Ritchie, "Air Power Victorious? Britain and NATO Strategy during the Kosovo Conflict," in *Air Power History: Turning Points from Kitty Hawk to Kosovo*, ed. Sebastian Cox and Peter Gray (London: Frank Cass, 2002), 325.

3. *Washington Times*, 16 May 1999, C9; *Washington Post*, 24 May 1999, A25; and *New York Times*, 27 May 1999, A33. Michael Walzer, a philosopher, offered the rather bizarre opinion that "you can't kill unless you are prepared to die." Michael Walzer, "Kosovo," in *Kosovo: Contending Voices on Balkan Interventions*, ed. William Joseph Buckley (Grand Rapids, Mich.: William B. Eerdmans Publishing, 2000), 334.

4. *Civilian Deaths in the NATO Air Campaign* (New York: Human Rights Watch, 7 February 2000), 9–10.

# Myth 14

> Despite all the talk by airmen, the employment of airpower remains an indiscriminate use of military force that deliberately targets civilians.*

Various books and articles continue to perpetuate this myth. Although one must keep in mind Mark Twain's cautionary statement regarding lies, damned lies, and statistics, the following statistics are fairly unambiguous. In *The Twentieth Century Book of the Dead,* Gil Elliot estimates that 110 million people—military and civilian—is "a reasonably conservative estimate" of the number who died in wars during the first seven decades of the twentieth century.[1] More than half of

*See, for example, Michael A. Carlino, "The Moral Limits of Strategic Attack," *Parameters* 32 (spring 2002): 15–29; Conrad C. Crane, "Sky High: Illusions of Airpower," *National Interest* 65 (fall 2001): 116–22; and Gen Gordon R. Sullivan, "Lessons That Still Apply," *Washington Times,* 3 March 2001, A10. Sullivan is a former US Army chief of staff.

those people died due to genocide and forced starvation. Of the 46 million victims of "technology," Elliot lists the causes of death as small arms (24 million), "big guns" (18 million), "mixed" (3 million), and aerial bombing (1 million).[2] He notes that the figure of 1 million dead due to air attack may be higher but is certainly less than 2 million.[3] Thus, even if we add the numbers of those who have died since Elliot wrote in 1972, the number of noncombatants dying due to air attacks during the entire twentieth century would not exceed 2 million.

Other researchers have produced a figure of 170 million dead in both internal and external wars during the twentieth century.[4] Those who advance higher casualty figures usually attribute the additional deaths to dictators even more vicious than those assumed by Elliot. Gerhard Weinberg, for example, states that 60 million people died in World War II (10 million more than most estimates) and that those extra deaths occurred largely as a result of the finding that more civilians starved and were massacred on the

Eastern Front and in China than originally thought.[5] One should bear in mind that 15 million Russian civilians died during the war—and that virtually no German bombing took place on the Eastern Front. Similarly, over 1 million civilians died in the siege of Leningrad, in which air attack played a negligible role.[6]

Similarly, one of the pervasive myths from World War II concerns the death toll at Dresden, Germany. One finds wildly inflated figures regarding the number killed, but in truth, fewer than 30,000 died there. David Irving, one of the first historians to study the subject, initially gave a figure of 135,000 dead. Later, however, he lowered it to 25,000. Unfortunately, many commentators continue to cite his first number.[7] Even so, as terrible as that smaller death toll is, more than five times as many civilians died in the ground fighting on Okinawa in April and May of 1945.

If we accept the staggering figures presented above, of the 170 million people who died in wars during the twentieth century, the overwhelming majority

were victims of military operations by armies, navies, and paramilitary "police" forces. Perhaps 3 million people, military and civilian (less than 2 percent of the total) succumbed to air attack. More statistics relative to warfare since World War II are instructive:

- According to Green Peace, 3,000 civilians died in the six-week Desert Storm air campaign; later studies lower that figure to 1,000.[8]
- The United Nations International Children's Emergency Fund (UNICEF) reported in 1999 that the infant mortality rate in Iraq more than doubled in the decade following the imposition of United Nations (UN) sanctions. Worse, the mortality rate for children under five jumped from 56 deaths per 1,000 live births to 131. Consequently, between 1990 and 1998, over 225,000 Iraqi children died as a direct result of "bloodless" sanctions imposed by the UN.[9]
- Milosevic told US ambassador Richard Holbrooke that perhaps 25 Serbs died in the 1995 air campaign

over Bosnia; NATO lost one aircraft, whose two crew members were captured and later released.[10]

- Human Rights Watch states that approximately 500 civilians died in the 78-day NATO air campaign over Serbia/Kosovo; NATO suffered no casualties.[11]
- Eighteen US Army Rangers died in Mogadishu, Somalia, and another 80 or so were wounded; but at least 500 Somali civilians were killed, and another 500 wounded during the 24-hour firefight of October 1993.[12]
- The International Campaign to Ban Landmines claims that between 15,000 and 20,000 people, many of them children, were victims of land-mine detonations in 71 different countries in 2000.[13] The United States is not a signatory of the Mine Ban Treaty.

Certainly, it is most regrettable that *any* civilians are killed or injured by air attack, but we must be realistic. Innocent people always die in war—tens of millions

of them over the past century. Given that less than 2 percent were victims of air attack, to charge that airpower is an indiscriminate or inhumane weapon seems rather peculiar. Unfortunately, some critics still do so. Yet, the arithmetic and facts are clear. The biggest killers of the twentieth century were small-arms fire, blockades, sanctions, sieges, artillery fire, land mines, and—worst of all—despotic leaders who inflicted genocide and starvation on friend and foe alike.

War is indeed hell and always has been, but there are ways to mitigate its effects on the innocent. Airpower advocates and theorists have maintained since the advent of flight that the airplane offered a form of war that was less deadly, to *both* sides, than traditional means of war on land and sea. History has proven these prophets correct. Moreover, the ability of aircraft to project force in a discriminate manner so as to minimize civilian casualties and collateral damage has continued to increase over the past two decades. Airpower is not the answer to all problems, and it

can still inflict most grievous harm. Yet, recent conflicts have made clear that the centuries-old desire to wage war with humanity and discrimination is finally becoming possible.

Notes

1. Gil Elliot, *Twentieth Century Book of the Dead* (New York: Scribner's, 1972), 249.

2. Ibid., 154

3. Ibid., 161.

4. R. J. Rummel, *Death by Government: Genocide and Mass Murder in the Twentieth Century* (New Brunswick, N.J.: Transaction Publishers, 1994), table 1.2, 4. See also William Eckhardt, "War-Related Deaths since 3000 B.C.," *Bulletin of Peace Proposals* 22 (fall 1991): 437–44.

5. Gerhard Weinberg, *A World in Arms: A Global History of World War II* (New York: Cambridge University Press, 1994), 894.

6. Harrison E. Salisbury, *The 900 Days: The Siege of Leningrad* (New York: Harper & Row, 1969), 514–16. Salisbury states that over 1 million died due to starvation, with a total of between 1.3 and 1.5 million dying from all causes. Another source also claims over 1 million civilian dead, noting that less than half that number (455,325) of Soviet military personnel also died at Leningrad. David M. Glantz, *The Battle for Leningrad, 1941–1944* (Lawrence: University Press of Kansas, 2002), 543, 547.

7. David Irving, in *The Destruction of Dresden* (London: W. Kimber, 1963), 163, cites a figure of 135,000 killed. Later, he wrote a letter to the *London Times*, 7 July 1966, stating that his original figure was a propaganda number supplied by the communists. After the book's publication, he discovered in the East German archives the report of the Dresden fire commissioner written shortly after the attack, stating that no more than 25,000 were killed. Irving also notes that Nazi propaganda statements at the time gave figures of over 300,000 dead. Although this number has no basis in fact, it has been repeated by sloppy historians on several occasions since. Editors Frederic Solomon and Robert Q. Marston in *The Medical Implications of Nuclear War* (Washington, D.C.: National Academy Press, 1986), 75, give a figure of 135,000 to 250,000 dead, and Stephen A. Garrett in *Ethics and Airpower in World War II: The British Bombing of German Cities* (New York: St. Martin's Press, 1993), 20, cites the number killed as 200,000. Michael S. Sherry gives a truly astonishing figure of 600,000 killed at Dresden—thus doubling the figure of Joseph Goebbels himself! *The Rise of American Air Power: The Creation of Armageddon* (New Haven, Conn.: Yale University Press, 1987), 260.

8. John G. Heidenrich, "The Gulf War: How Many Iraqis Died?" *Foreign Policy* 90 (spring 1993): 108–25.

9. UNICEF, *Iraq Child and Maternal Mortality Survey, 1999, Preliminary Report*, July 1999, 10, on-line, Internet, 3 September 2003, available from http://www.unicef.org/reseval/iraqr.html; and Fourth Freedom, *Morbidity and Mortality among Iraqi*

*Children from 1990 through 1998: Assessing the Impact of the Gulf War and Economic Sanctions*, March 1999, 1, on-line, Internet, 3 September 2003, available from http://www.fourthfreedom.org/php/t-si-index.php?hinc=garf-index.hinc.

10. Col Robert C. Owen, ed., *Deliberate Force: A Case Study in Effective Air Campaigning* (Maxwell AFB, Ala.: Air University Press, 2000), 161.

11. *Civilian Deaths in the NATO Air Campaign* (New York: Human Rights Watch, 7 February 2000), 5.

12. Mark Bowden, *Black Hawk Down: A Story of Modern War* (New York: Atlantic Monthly Press, 1999), 333. Bowden notes that many of the frightened US soldiers stated that they simply shot at anything that moved, spraying bullets at every window, door, street, and person: "especially people. They were all going down. It was a free-for-all now. All semblance of an ordered retreat was gone. Everybody was just scrambling" (287).

13. International Campaign to Ban Landmines, "Landmine Monitor Report 2001: Toward a Mine-Free World," August 2001, on-line, Internet, 3 September 2003, available from http://www.icbl.org/lm/2001.

# Index


Abrams, Creighton W., 76
air attack, 48–49, 65, 109, 116–20
Air Corps Tactical School (ACTS), 17–19, 28
aircraft
    A-8, 21
    Allied, 36, 43, 110
    Apache, 105
    attack, 20
    AV-8, 105
    B-10, 21
    B-15, 20
    B-17, 12, 20
    B-18, 12
    B-19, 20
    B-24, 20, 35
    B-29, 32, 36, 54, 58
    B-52, 77–79, 87, 89, 101
    Black Hawk, 105
    cargo, 21, 42
    Comanche, 105
    F/A-18, 105
    Joint Strike Fighter, 105
    MiG, 8, 87
    Soviet, 43
    V-22, 105
air interdiction, 85, 96, 100–101, 104
Air Service, 3, 10
air superiority, 34, 86, 104
air support, 17, 19–20, 73, 77, 80, 99–100, 103
Air War Plans Division, Plan 1 (AWPD-1), 28

Andrews, Frank, 12–13, 63
antiaircraft artillery (AAA), 6, 65, 87
Arc Light, 79
Army Air Forces (AAF), 20–21, 23, 28–29, 32, 68–69, 75–76
Army aviation, 1, 5, 17, 27
Arnold, Henry "Hap," 23
atomic bombs, 53–54, 57–58

Battle of the Atlantic, 32, 35
blockade, 53, 56–57, 87
Bomber Command, 21, 36, 63, 69
bomber mafia, 21, 23
bombing, xiii, xiv, 17–18, 20, 27–28, 31–34, 39, 42–43, 47, 49–50, 53, 57–59, 63, 66, 73, 85–86, 88–89, 94, 99, 109–11, 116–17
Bosnia, 119
Bradley, Omar, 21
budget, 1–5, 69
Bundy, McGeorge, 76
Bunker, Ellsworth, 75–76

Cannon, Joe, 23
Carter, Jimmy, 111
center of gravity, 102
Churchill, Winston, 43
civilian casualties, 110, 112–13, 120
Clifford, Clark M., 76
Clinton, Bill, 109
close air support, 73, 80, 100, 104
coalition air campaign, 99
collateral damage, 110, 112, 120
Combined Bomber Offensive (CBO), 2, 39–40, 42, 44
command and control, 104

Congress, 5–7
Craig, Malin, 12–13

D day, 33, 43, 65
doctrine, 1, 17–19, 28–29, 73, 81, 88
Douhet, Giulio, 27
Dresden, 117
Drum, Hugh, 5

Eaker, Ira, 22–23
Eastern Front, 31, 117
Eighth Air Force, 21–23, 41
Eisenhower, Dwight, 34
Elliot, Gil, 115–16

Far East Air Forces, 22
Federal Aviation Commission, 7–8
Feinstein, Dianne, 110
Felt, Harry D., 76
Field Manual (FM) 1-5, *Employment of Aviation of the Army,* 19, 28
Fifteenth Air Force, 22
fighter pilots, 22–23, 44

General Headquarters (GHQ) Air Force, 12
Geneva Disarmament Conference, 2
Germany, 28–29, 32–33, 35, 39–42, 47, 49, 64–65, 117
gradual escalation, 88

Haiphong, 86–87, 89, 93
Hanoi, 86, 89, 93
Harkins, Paul D., 76
Harmon, Millard "Miff," 23
Headquarters Pacific Command, 79
hearings, airpower, 7

Hirohito, 58
Hitler, Adolf, 41, 43, 65
Ho Chi Minh, 85
Holbrooke, Richard, 118
Howell, Clark, 7

interwar period, 7, 10, 29
invasion
    of Japan, 32, 53–56
    of Normandy, 32, 34, 44, 66
    of Serbia, 110
Iraq, 101, 118
Irving, David, 117

Japan, 29, 32, 35–36, 48–49, 53–59, 67–68
Jodl, Alfred, 66
Johnson, Lyndon B., 76, 88
Joint Chiefs of Staff (JCS), 22, 76, 87–88, 90, 110

Kennedy, John F., 76
Kenney, George, 22
Khe Sanh, 79
Kissinger, Henry M., 76
Konoye, Fumimaro, 58
Korean War, 22
Kosovo, 17, 31, 109, 111–12, 119

Laird, Melvin C., 76
laser-guided bombs, 102
LeMay, Curtis E., 36, 77
Lewis, Anthony, 93
Lewy, Guenter, 94–95
Linebacker II, 89–90, 93
Lodge, Henry Cabot, 76
Luftwaffe, 21, 42–44

MacArthur, Douglas, 5–7, 11–12, 22, 53
manning, 8–9, 65
McCain, John S., Jr., 76
McGovern, George, 93
McNamara, Robert S., 75–76
Mediterranean Allied Air Forces, 22
Milosevic, Slobodan, 113, 118
mining operations, 36, 87
Mitchell, Billy, 13
Moffat, Jay Pierrepont, 2
Mogadishu, 119
Momyer, William, 80
Moorer, Thomas H., 76, 90
morale, 3, 29, 47–50

Nagano, Osami, 58
XIX Tactical Air Command, 23
Ninth Air Force, 21–22
Nixon, Richard M., 76
North American Air Defense Command, 22
North Atlantic Treaty Organization (NATO), 109–10, 112–13, 119
North Vietnam, 73, 75, 79, 85–89, 94

Okinawa, 32, 54–56, 117
operations
    Allied Force, 112
    Desert Storm, 99, 118
    Iraqi Freedom, 103–4
    Overlord, 34
Overy, Richard J., 63, 67

Partridge, Earle “Pat,” 22
Persian Gulf War, 74, 99–100, 103

Potsdam Declaration, 53
precision-guided munition (PGM), 111

Quesada, Elwood "Pete," 23

Rolling Thunder, 75, 85–86
Roosevelt, Franklin D., 7
Rostow, Walt W., 76
Route Package 1, 79
Royal Air Force (RAF), 21, 29, 69
Royal Navy, 35
rules of engagement, 87

Sakomizu, Hisatsune, 58
2d Tactical Air Force, 21
Serbia, 109, 111, 119
Seventh Air Force, 79–80
Sharp, U. S. Grant, 76, 79
Shelton, Hugh, 110
Southeast Asia, 78–79
South Vietnam, 74–80, 87, 89, 94–96
Speer, Albert, 40–41
Stockdale, James B., 90
Strategic Air Command, 22
strategic air operations, xiii, xiv, 12, 17–18, 20, 31–34, 47, 63, 67, 73, 85, 88, 99, 101, 103, 115
surface-to-air missile (SAM), 10, 13, 29, 43, 63, 74, 86–87, 89, 95
Suzuki, Kantaro, 58

Tactical Air Command, 23
tactical aviation, 22–23, 78
Taylor, Maxwell D., 75–76
Tet offensive, 74, 95
Tomahawk cruise missiles, 102

Truman, Harry, 53
Twelfth Air Force, 21, 23
12th Army Group, 21
Twentieth Air Force, 22
25th Infantry Division, 96
XXI Bomber Command, 36
Twining, Nathan, 22

U-boats, 35
United Nations (UN), 118
United Nations International Children's Emergency Fund, 118
United States Strategic Bombing Survey (USSBS), 47–48, 50, 63, 67–68
US Air Forces Europe, 23
US Army, xiii, xiv, 1–12, 17–21, 27, 44, 56, 69, 73–77, 79–81, 94–96, 99–101, 105–6, 115, 119
US Army Air Corps, 1–3, 5–12, 17, 19–21, 27–28
US Central Command, 102, 104
US Marine Corps, 2, 29, 55, 74, 79–80, 95–96, 100, 105–6
US Military Assistance Command, Vietnam (MACV), 77, 79
US Navy, 2, 4, 18, 31, 35, 68–69, 74–76, 79, 100, 106, 109

Vandenberg, Hoyt, 22
Vietcong, 74, 94, 96
Vietnam, 73–80, 85–89, 93–96, 109
Vietnam War, 73–74, 76–77, 85, 93–94

War Department, 3, 7–8
weapons of mass destruction, 104
Weinberg, Gerhard, 116
Westmoreland, William C., 76–77, 79–80, 95

Westover, Oscar, 12
Wheeler, Earle G., 75–76
Wicker, Tom, 93
Williamson, Ellis, 96
World War I, 27, 35, 56
World War II, 1, 12, 17, 20, 22, 27, 31, 35, 39, 47, 56, 63, 68, 73, 110, 116–18

Airpower:
Myths and Facts

*Air University Press Team*

*Chief Editor*
Marvin Bassett

*Copy Editor*
Lula M. Barnes

*Book Design and Cover Art*
L. Susan Fair

*Illustrations*
L. Susan Fair

*Composition and*
*Prepress Production*
Vivian O'Neal

*Quality Review*
Joan Dawson

*Print Preparation*
Joan Hickey

*Distribution*
Diane Clark