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Great Soldiers on Airpower

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THE ROLE OF airpower in modern war engenders continuous debate. For some military thinkers, the case for airpower has not been made. Gen Frederick Kroesen, USA, Retired, former commander of US Army Europe, believes airpower is more promise than fact. He wrote to the *Washington Post* that "none of the great air campaigns of the past has ever been decisive, and many have had contrary results. . . . All were sideshows to the Army and Marine efforts to occupy land and dominate the enemy."[1] In a similar vein, the Association of the United States Army suggests devoting greater resources to Army armor and artillery at the expense of new airpower weapons, such as the F-22: "Hopefully, proponents of the capability of air power to defeat enemy ground forces will finally be correct; its claimed effective-

A view of the invasion forces landing at Omaha Beach, 6 or 7 June 1944. [General Eisenhower] testified to Congress that . . . "unless we had faith in the air power to intervene and to make safe that landing, it would have been more than fantastic, it would have been criminal."

ness has not yet materialized."[2] These are far from the only airpower skeptics, but they illustrate a point: there is considerable suspicion about airpower's impact in modern war.

Such suspicion is surprising, given airpower's successful war record. These successes are well articulated by seven experts on modern war, all but one of whom were great soldiers. Their words testify to the decisive character of airpower in modern war.

General of the Army Dwight D. Eisenhower

As Supreme Allied Commander in Europe during World War II, Gen Dwight Eisenhower had a unique perspective. Not only did this career soldier command all Allied ground forces, he also led Allied air forces. He commanded bomber groups that attacked German industry. He commanded Allied tactical air forces that interdicted German surface forces, gained air superiority, and flew close air support of surface forces. Eisenhower also commanded ground forces whose scheme of maneuver depended on coordination with air forces. Conversely, he was responsible for forces that withstood German air attacks.[3] So Eisenhower saw air power from both sides. He witnessed both the offensive and defensive effects of airpower at all levels of war. Arguably, Eisenhower had the finest perspective on the effects of airpower during World War II. What did he learn from his experiences?

Based on his wartime lessons, Eisenhower concluded that airpower dominated modern war. He wrote in his memoir *Crusade in Europe,* "Here [the Normandy campaign], as always, emphasized the decisive influence of airpower in the ground battle."[4] He testified to Congress that

> 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 actions, could have an effect on the ground of making it possible for a small force of land troops to invade a continent, a country strongly defended, in which there were 61 enemy divisions and where we could not possibly on the first day of the assault land more than 7 divisions.
>
> Without that air force, without the aid of its power, entirely aside from its ability to sweep the enemy air force out of the sky, without its ability to intervene in the land battle, that invasion would have been fantastic.
>
> To a lesser extent that also applied at Salerno. In that operation there were 3 divisions that we had at Salerno, two in the toe of the boot, and there were 19 divisions of the enemy in Italy arrayed against us.
>
> Unless we had faith in the air power to intervene and to make safe that landing, it would have been more than fantastic, it would have been criminal.[5]

As Army chief of staff in 1948, Eisenhower wrote a sweeping endorsement of airpower. In his annual report to the secretary of the Army, Eisenhower stated that "the Army supports the theory that air power occupies a dominant position in modern warfare."[6] That is a uniquely strong endorsement of another service by a service chief. It is difficult to imagine a US Army general saying similar words today, a half century after Eisenhower's service as Army chief of staff. However, Eisenhower did more than simply put his endorsement of air power on the record. He also took extraordinary steps to implement his beliefs.

As president, Eisenhower gave his highest priorities to the Air Force. During his presidency (1953–61), the Department of the Air Force received 46 percent of military spending. The Army and Navy/Marine Corps received 26 percent and 28 percent, respectively.[7] The high-water mark occurred in 1957, when the Air Force received 48 percent of total military spending. In constant (1998) dollars, Department of the Air Force outlays in 1957 equaled $120 billion, which is 60 percent *greater* than 1996's Air Force outlay figure of $75 billion.[8] This money funded a rapid expansion in theater weapons, such as the "century" series of fighter planes.[9] It also funded strategic systems, such as bombers and missiles.

That the Air Force surged during Eisenhower's administration is well known. What is less well known, however, is the priority given the Air Force versus the other services by the Eisenhower administration. This ex-Army general—in fact, one of the greatest Army generals in American history—gave almost twice as much money to the Air Force as he gave to the Army. He also named Air Force generals as chairman of the Joint Chiefs of Staff (Nathan Twining, one of only three Air Force generals ever named chairman) and Supreme Allied Commander Europe (Lauris Norstad, still the only Air Force officer to hold this position). These pro–Air Force priorities reflected General Eisenhower's highly credible judgment on the decisive nature of airpower.

Gen George S. Patton

In December 1944, Lt Gen George Patton's Third Army prepared to attack the Saar. Indications of a German offensive towards the north, in the Ardennes, concerned Patton. But the weather bothered him more. The skies were overcast. Incessant rains turned the ground into mud. Heavy fog and freezing tem-peratures made the environment miserable. In typical fashion, Patton tried an "alternative" solution. He ordered his chaplain to write a now-famous "weather prayer" to "restrain these immoderate rains." Why did Patton want good weather? For his armor and logistics? For better conditions for his troops? Of course Patton wanted these things—but there was another important reason.

Patton wanted good weather to get Allied air forces into the fight—because he understood airpower. Patton realized that effective air attack denied the Germans operational-level mass, maneuver, and logistics. In the face of massive air attack, enemy forces

couldn't mass, move, or efficiently resupply. Without such capabilities, any military force was ineffective against a competent, aggressive foe.

Patton recognized the dilemma that Allied air power forced on the German army. Whenever the Germans massed, Allied air attacked that concentration. Whenever the Germans tried to protect themselves by dispersing, Patton's armor pierced the thinned defenses. When the Germans tried to maneuver in force, Allied air detected and killed major movements before they came to bear. This is why Patton told Brig Gen Otto P. Weyland, commander of 19th Tactical Command, "I am going to depend on you to protect my right flank with your airplanes."[10] Patton seized on his advantage in the air to defeat a very competent enemy who possessed superior ground numbers and had the advantages inherent to defenders on their home territory.

After the Germans attacked through the Ardennes with 17 divisions on 16 December 1944, they enjoyed seven days of poor flying weather. Allied air superiority was ineffective for a week due to fog and clouds. Ninth Air Force, with 1,550 planes, flew only eighteen hundred sorties that week in the battle area, most of which were aerial-combat sorties.[11] With clear weather, however, the fighter-bombers went back to work. On Christmas day alone, Ninth Air Force flew 1,920 sorties in the battle area—more sorties in one day than in the entire preceding week.[12] The official US Army history of World War II summarizes the impact of this air offensive: "The morning of 23 December broke clear and cold. 'Visibility unlimited,' the air-control posts happily reported all the way from the United Kingdom to the foxholes of the Ardennes front. To most of American soldiery this would be a red-letter day—long remembered—because of the bomber and fighter-bombers once more streaming overhead like shoals of silver minnows in the bright winter sun, their sharply etched contrails making a wake behind them in the cold air."[13] It's too bad that current military writing fails this standard of prose.

This pattern wasn't limited to the Battle of the Bulge. Patton saw the same model during the Normandy breakout: "I was convinced

A P-47 overflies a Third Army tank column. After the breakout in France, [General] Patton told Brig Gen Otto P. Weyland, commander of 19th Tactical Command, "I am going to depend on you to protect my right flank with your airplanes."

our Air Service could locate any groups of enemy large enough to be a serious threat, and that I could also pull something out of the hat to drive them back while the Air Force in the meantime delayed their future advance."[14]

Patton understood that no enemy commander could confidently expect a smooth logistics flow in the face of Allied airpower. Major roads and rail lines were death traps. Allied air induced enough friction into the enemy's logistics, command and control, and scheme of maneuver to keep the Germans off balance, which allowed daring, rapid advances by Third Army. Patton understood the "trump card" that Allied airpower gave him—and seized the opportunity. A fundamental part of General Patton's genius in armored warfare was his appreciation of airpower.

General of the Army George C. Marshall

In the immediate aftermath of the Battle of the Bulge, Gen George Marshall reported to the secretary of war that "the weather has favored us recently and rather unexpectedly. The past few days have permitted our crushing air superiority to be directed against the enemy troops, tanks, trains, and communications. His marshaling yards are being blown to bits. Aside from the fighting spirit of our troops, no other factor means so much to us in the present situation as flying weather."[15]

Airpower's effectiveness was not a revelation to Marshall. Seven months earlier, in a memorandum to the secretary of war, Marshall identified the crucial role of airpower: "We are about to invade the continent and have staked our success on our air superiority, on Soviet numerical preponderance, and on the high quality of our ground combat units."[16] Marshall knew that airpower would not prove decisive all by itself; he stated many times that no one military arm can win a war alone.[17] However, by placing airpower on a par with the size of the Soviet army and the quality of American ground forces, Marshall explicitly recognized airpower's crucial role.

Gen George Marshall. Late in 1943, in a memorandum to the secretary of war, Marshall identified the crucial role of airpower: "We are about to invade the continent and have staked our success on our air superiority."

Earlier, he had codified the importance of airpower. Field Manual (FM) 110-20, *Command and Employment of Air Power,* published under Marshall's signature in July 1943, stated as its major theme that "land power and air power are co-equal and interdependent." It went on to state the US Army's doctrine that "the gaining of air superiority is the first requirement for the success of any major land operation."[18] After gaining air superiority, the first priority of tactical air forces was to "prevent the movement of hostile troops and supplies into the theater of operations or within the theater."[19] These were combat-proven precepts. They reflected arguments fostered by the Air Corps Tactical School and proven during operations in North Africa and the South Pacific. Marshall codified these precepts into the basic fighting doctrine of the Army. In fact, airpower's contributions during the first two years of World War II garnered Marshall's highest praise: "The outstanding feature to date of America's war

effort has been the manner in which our air forces have carried the war, in its most devastating form, to the enemy."[20] Without a doubt, General Marshall understood airpower.

General of the Army Omar N. Bradley

In 1945 Gen Omar Bradley wrote a book titled *Effect of Air Power on Military Operations, Western Europe,* in support of the United States Strategic Bombing Survey.[21] In this book, Bradley addressed the broadest reach of ground-force operations, from defensive operations (e.g., Bastogne) and breakthroughs (e.g., Operation Cobra) to assaults on defended river lines and fortress cities. In each of these ground operations, Bradley found air operations critical to overall success. He supported his findings with quotations from several ground commanders, both American and German. For example, Bradley summarized an interview with Field Marshal Gerd von Rundstedt: "Carpet bombing in the main line of resistance is the type of air actions most detrimental to German ability to defend a position. He [von Rundstedt] rates the efficiency of the bombing on a par with the strength of the defenders and the initiative of the ground attackers. . . . The [German] troops could not move and were demoralized; the communications system broke down; artillery and antitank pieces were knocked out; and tanks were immobilized in craters or beneath heaps of dirt and debris."[22]

Bradley expounded on von Rundstedt's statements: "From the high command to the soldier in the field, German opinion has been agreed that air power was the most striking aspect of allied superiority."[23] This opinion was endorsed by Lt Gen Hans Speidel, Field Marshal Erwin Rommel's chief of staff: "Air forces were the decisive factor for the Allied victories in the [Normandy] inva-

The effect of airpower on tanks—Wehrmacht panzers in northern France after D day. [According to] Lt Gen Hans Speidel, Field Marshal Erwin Rommel's chief of staff: "Air forces were the decisive factor for the Allied victories in the [Normandy] invasion and subsequent operations."

A B-17 over Berlin in early 1945. Franklin D'Olier, chairman of the United States Strategic Bombing Survey, concluded that "the German experience suggests that even a first class military power—rugged and resilient as Germany was—cannot live long under full-scale and free exploitation of air weapons over the heart of its territory."

sion and subsequent operations."[24] Maj Gen F. W. von Mellenthin, chief of staff of the Fifth Panzer Army, made a similar judgment: "The Ardennes battle drives home the lesson that a large-scale offensive by massed armor has no hope of success against an enemy who enjoys supreme command of the air."[25]

On the American side, Bradley quoted Lt Gen J. Lawton Collins's appraisal of the Allied advantage in airpower:

> The effect of this bombing on the enemy's transportation system . . . was most marked during the exploitation of the St. Lo breakthrough about August 1, 1944, when German troops were obviously unable to move with sufficient speed to meet our attacks. . . . The pattern bombing by the heavies, particularly on the front of this corps along the St. Lo-Periers road, had a devastating effect. Enemy communications were completely disrupted resulting, in some areas, in an almost total lack of coordinated resistance following the bombing. Most prisoners taken by our troops were stunned and bewildered by the bombing. The morale factor was truly shattering. There can be no question that the bombing was a decisive factor in the initial success of the breakthrough.[26]

Nor did Bradley limit his comments to operational-level airpower. After the war, he told Congress that strategic bombing "had a decisive effect on the ultimate ability of the allies to defeat Germany in a shorter time, saving many, many lives and dollars."[27] Although General Bradley, like Marshall and Eisenhower, understood that airpower cannot win a war alone, he fully appreciated its decisive effect.

Franklin D'Olier

Although nearly forgotten today, Franklin D'Olier was the chairman of the United States Strategic Bombing Survey, conducted immediately after World War II. In a letter to the

House Armed Services Committee in 1949, D'Olier cited the survey's key finding: "Allied air power was decisive in the war in western Europe."[28] He wrote this letter in response to airpower critics who had misused this survey to argue that bombing was ineffective against Germany. D'Olier—arguably the paramount expert on this survey—called such criticisms a "distortion." He quoted the survey's summary report:

> The German experience suggests that even a first class military power—rugged and resilient as Germany was—cannot live long under full-scale and free exploitation of air weapons over the heart of its territory. By the beginning of 1945, before the invasion of the homeland itself, Germany was reaching a state of helplessness. Her armament production was falling irretrievably, orderliness in effort was disappearing, and total disruption and disintegration were well along. Her armies were still in the field. But with the impending collapse of the supporting economy, the indications are convincing that they would have had to cease fighting—any effective fighting—within a few months. Germany was mortally wounded.[29]

After a thorough and impartial review, D'Olier came to the same conclusion as the leading soldiers of World War II: air power was decisive.

Gen Vo Nguyen Giap

In late March 1972, Gen Vo Nguyen Giap attacked South Vietnam with two hundred thousand regular North Vietnamese troops. At that time, there were no major US ground-combat forces in South Vietnam; the last major unit withdrew in January 1972.[30] American advisors and logistical support were still in South Vietnam, but major US ground-combat forces were gone.

Giap thought the situation ripe for a strategic offensive. Unfortunately—for Giap and half his attack force—American air-

In late March 1972, Gen Vo Nguyen Giap attacked South Vietnam with two hundred thousand regular North Vietnamese troops. Land- and carrier-based airpower [like this B-52] slaughtered Giap's formations. . . . In the end, Giap lost half his force—one hundred thousand men.

Airpower versus armored forces—the Gulf War. One Iraqi soldier complained, "During the war with Iran my tank was my friend. I could sleep in it at night and know that I was safe. However, during this war my tank became my enemy. No one would go near a tank at night because they just kept blowing up."

power was still in the theater. Land- and carrier-based airpower slaughtered Giap's formations. Buttressed by this support, the South Vietnamese army fought hard. In the end, Giap lost half his force—one hundred thousand men. After 10 weeks, the offensive petered out.

Three years later, in the spring of 1975, Giap launched another "final" offensive with a total of one hundred thousand troops (half the 1972 number). This time the South Vietnamese army collapsed. Giap captured Saigon in six weeks. The war ended as Americans watched Saigon's evacuation on television.

Giap's two offensives, occurring three years apart, produced radically different results. Why the huge difference between 1972 and 1975? Was the North Vietnamese army substantially better in 1975 (despite being half its 1972 size)? Was the South Vietnamese army substantially worse in 1975? Although either condition is theoretically possible, the role of American airpower constitutes the more likely difference.

The official US Army history of the 1972 Easter offensive reports the critical importance of airpower. The southern thrust of the North Vietnamese attack surrounded An Loc, 60 miles north of Saigon. An Loc was strategically vital; its capture "would open the door to Saigon." [31] However, after initial setbacks, the South Vietnamese rallied to defend An Loc. This success was a close call in which airpower played the decisive role. The official history quotes the senior American Army officer on the scene: "An Loc would have never held out without the handful of American advisors directing the air strikes and shoring up the local leadership." [32] The description of the effect of the 887 B-52

strikes on the enemy is telling.[33] The threat of heavy-bomber strikes "forces the enemy to break up his ground elements into small units and makes it difficult to mass forces for an attack. If he does mass his forces, he takes terrible casualties."[34] This is the traditional dilemma inflicted by effective airpower on surface forces. To surmount a determined defense, an attacker must mass. However, in the face of effective airpower, massing is suicidal. An Loc exemplified this axiom.

During the 1972 offensive, allied land- and carrier-based pilots flew 50,000 fixed-wing strike sorties against Giap's forces.[35] Their attacks were clearly decisive. However, US air strikes played no role in the 1975 offensive. By 1975 America had withdrawn from the war. American airpower was completely gone (along with the American advisors who could direct the air strikes). Unlike the massive air strikes in 1972, there were no massive air attacks on North Vietnamese forces during their 1975 offensive. Giap could mass, maneuver, and resupply at will. The net effect was startling. With half the forces and half the time, the North Vietnamese rolled victoriously into Saigon. General Giap had learned the decisive nature of airpower.

Gen Khaled bin Sultan

Gen Khaled bin Sultan commanded joint forces during the 1991 Gulf War. His major force elements were from Saudi Arabia, Egypt, Syria, and Kuwait.[36] During the ground offensive, their mission was to attack from Saudi Arabia directly into Kuwait. This meant attacking into the supposed teeth of Iraqi defenses. The highest number of coalition casualties was expected in this area. Gen H. Norman Schwarzkopf's "Hail Mary" flanking maneuver far to the west with VII and XVIII Corps was specifically designed to avoid these defenses.

As most people are well aware, Khaled's offensive was a complete success. His forces, alongside two divisions of American marines, advanced with minimal casualties. According to the official Department of Defense report, Joint Forces Command East "secured its objectives against light resistance and with very few casualties; however, progress was slowed by the large number of Iraqis who surrendered."[37] Khaled praised the skill of his ground commanders but gave most of the credit for this success to coalition airpower:

> Both psychologically and physically, it must have been terrible to be on the receiving end of Coalition air power. From the start of the war the dilemma facing Iraqi troops was acute: they got hit if they stayed in their fortifications, they got hit if they fired their heavy guns, they got hit if they moved, and they got hit by Iraqi execution squads if they tried to cross over to us. . . . It was clear that the 38-day air campaign had done far more damage than we had imagined. There was little fight left in the Iraqi divisions facing our troops. Indeed, they must have realized the war was over.[38]

Because of coalition air attacks, Iraqi divisions facing Khaled's forces were unable to survive no matter what they did. If they dug in, air strikes destroyed them piecemeal. One Iraqi soldier complained, "During the war with Iran my tank was my friend. I could sleep in it at night and know that I was safe. However, during this war my tank became my enemy. No one would go near a tank at night because they just kept blowing up."[39] Nor could the Iraqis maneuver. When Iraqi divisions attempted to flee north to Iraq, their high signature keyed intensive coalition air strikes. One section of road became known as the "high way of death." This was a classic dilemma for the Iraqis. They could stay in one place and be killed or attempt to move and be killed. They faced a dilemma that only defeat could resolve.

Coalition ground commanders faced no such dilemma. They could maneuver massive forces at will. For example, Schwarzkopf deployed a quarter million troops with 60,000 vehicles and their supplies four hundred miles to the west over a single road. At its peak, traffic near the Iraqi border was 18 vehicles per minute, 24 hours a day, seven days a week.[40] This logistics flow was crucial to the entire operational scheme. During the ground offensive, the US Army's VII Corps drew 1,330 truckloads of fuel and ammunition from these stocks *per day*.[41] Without this

massive logistical flow, there would have been no massive Hail Mary flanking attack, and without air supremacy, this logistical flow would have been impossible. However, despite the inherent vulnerability of truck convoys, the Iraqis were unable to interfere with this deployment. Although Iraqi impotence was critical, it is not even the most remarkable fact. The most remarkable fact is that—because of coalition air supremacy—the Iraqis were unable even to *detect* the massive movement of troops and supplies over several hundred miles of open desert.

It's important to note that, if anything, Khaled was at a disadvantage on the ground. After-action reports reveal that the Iraqis deployed approximately seven divisions opposite Khaled's approximately five divisions.[42] These Iraqi divisions had the inherent advantages of the defender. They employed fire trenches, minefields, barriers, and well-surveyed artillery zones—all of which coalition forces had to surmount. After their eight-year war with Iran, Iraq's divisions were experienced in war. Also, they were cohesive (i.e., all from one country). Khaled's forces, on the other hand, were drawn from 11 countries, none of which had any recent military successes. None could be considered elite. Despite these handicaps, Khaled's forces enjoyed Guderian-like success.[43] They exceeded the most optimistic timetables with minuscule casualties and captured 25,000 prisoners.[44] There has to be some logical explanation for these counterintuitive developments. According to General Khaled, the primary reason for these startling successes was airpower.

Conclusion

These great soldiers testified to the decisive nature of air power in modern war. At the strategic level of war, they saw airpower's unique ability to destroy an enemy nation from the inside out. They understood that when a nation cannot function, its military follows suit—and that airpower can render a nation dysfunctional. Bradley acknowledged this logic. D'Olier documented it. Eisenhower put the power of his presidency behind it.

At the operational level of war, where large numbers of forces mass and maneuver, Eisenhower, Marshall, Patton, Bradley, Giap, and Khaled have testified to airpower's decisiveness. Based on personal experiences with all types of military operations, each came to understand that surface forces cannot effectively move, shoot, and communicate under efficient air attack. As professional soldiers, they recognized this shortcoming as critical to any military operation. When one side can move, shoot, and communicate—while its opponent cannot—it has a decisive advantage. Each of these soldiers would vigorously argue that well-equipped and well-led surface forces are necessary to exploit this advantage, but each understood that control of the air enables this advantage in the first place.

Healthy skepticism is always valuable. The fact that something has worked in the past does not mean that one should slavishly rely on it indefinitely. Thus, a healthy skepticism of airpower's contributions in modern war is valid. However, critics must take the lessons of the past half century into account when they debate the merits of airpower. Some of the greatest soldiers of our era did so and came down firmly in support of the decisive nature of airpower. □

Notes

1. "Roles and Missions of the Armed Services" (letter to the editor), *Washington Post*, 7 November 1994, 22. General Kroesen commanded US Army Europe from 1979 to 1983.

2. For example, see Defense Report 97-9, *Tactical Aircraft Costs Limit Broader DoD Modernization*, October 1997, 2.

3. For example, these German attacks were at the strategic and operational levels of war (e.g., V-1 attacks on London and BF-109 attacks at Normandy, respectively).

4. Dwight D. Eisenhower, *Crusade in Europe* (Garden City, N.Y.: Doubleday & Company, 1948), 261.

5. Senate, *Testimony of General Dwight D. Eisenhower to the Committee on Military Affairs on S. 84,* 79th Cong., 1st sess., 16 November 1945, 360.

6. *Final Report of the Chief of Staff, United States Army, to the Secretary of the Army* (Washington, D.C.: Government Printing Office, 7 February 1948), 13.

7. Assistant Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 1998* (Washington, D.C.: Department of Defense, March 1997), table 6-13. Figures are for fiscal years 1954 through 1961. For comparison purposes, during the 10-year period 1987–1996, the Department of the Air Force averaged 32 percent of Department of Defense (DOD) outlays, with the Army and Navy departments averaging 27 percent and 34 percent, respectively. During this decade, the DOD share for each of the three departments remained relatively stable (i.e., within a range of three percentage points).

8. Ibid. In constant dollars, Army and Navy/Marine Corps outlays remained roughly the same.

9. This series included the F-100, F-101, F-102, F-104, F-105, and F-106.

10. George C. Marshall, Henry Harley Arnold, and Ernest Joseph King, *The War Reports of General of the Army George C. Marshall, Chief of Staff, General of the Army H. H. Arnold, Commanding General, Army Air Forces [and] Fleet Admiral Ernest J. King, Commander-in-Chief, United States Fleet and Chief of Naval Operations* (Philadelphia: J. B. Lippincott Company, 1947), 371.

11. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II,* vol. 3, *Europe: Argument to V-E Day, January 1944 to May 1945* (1951; new imprint, Washington, D.C.: Office of Air Force History, 1983), 688.

12. Ibid., 694.

13. Hugh Marshall Cole, *The Ardennes: Battle of the Bulge* (Washington, D.C.: Office of the Chief of Military History, Department of the Army, 1965), 468.

14. George S. Patton Jr., *War As I Knew It* (Boston: Houghton Mifflin Co., 1947), 113.

15. George C. Marshall, *The Papers of George Catlett Marshall,* ed. Larry I. Bland, vol. 4 (Baltimore: Johns Hopkins University Press, 1996), 713 (memorandum to the secretary of war, 16 May 1944).

16. Ibid., 449.

17. "The national security is measured by the sum, or rather the combination of the three great arms, the land, air, and naval forces." Senate, *Hearing Report on S. 84 and S. 1482,17 October–17 December 1945,* 81st Cong., 1st sess., 1945, 50.

18. FM 100-20, *Command and Employment of Air Power,* 21 July 1943, 1.

19. Ibid., 10.

20. Marshall, Arnold, and King, 107.

21. Omar Nelson Bradley, *Effect of Air Power on Military Operations, Western Europe by Omar N. Bradley, Military Advisor, United States Strategic Bombing Survey and Air Effects Committee, 12th Army Group* (Wiesbaden, Germany: n.p., 15 July 1945).

22. Ibid., 183.

23. Ibid., 184.

24. Hans Speidel, *Invasion 1944: Rommel and the Normandy Campaign* (Chicago: Henry Regnery Company, 1950), 170.

25. F. W. von Mellenthin, *Panzer Battles, 1939–1945: A Study of the Employment of Armour in the Second World War,* trans. H. Betzler, ed. L. C. F. Turner (London: Cassell, 1956), 342.

26. Bradley, 198, 214. Collins was the commander of VII Corps.

27. House, *Hearing Report on the National Defense Program—Unification and Strategy, 6–21 October 1947,* 81st Cong., 2d sess., 1950, 27.

28. Ibid., 406.

29. Ibid.

30. Clark Dougan and Stephen Weiss, *The American Experience in Vietnam* (New York: W. W. Norton & Company, 1988), 273.

31. Jeffrey J. Clarke, *Advice and Support: The Final Years, 1965–1973* (Washington, D.C.: US Army Center of Military History, 1988), 481.

32. Ibid., 486.

33. A. J. C. Lavalle, ed.,*Airpower and the 1972 Spring Invasion,* USAF Southeast Asia Monograph Series, vol. 2, monograph 3 (Washington, D.C.: Government Printing Office, 1976), 106.

34. Ibid., 103.

35. Ibid., 106.

36. Other nations in this force included Oman, Bahrain, United Arab Emirates, Niger, Senegal, and Morocco.

37. *Conduct of the Persian Gulf War, Final Report to Congress* (Washington, D.C.: Department of Defense, April 1992), 386.

38. Ibid., 405.

39. EPW debrief of senior Iraqi armored officer, in SAF/OSX report, "Debriefs of Senior Iraqi EPWs," May 1991.

40. William G. Pagonis with Jeffrey L. Cruikshank, *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War* (Boston: Harvard Business School Press, 1992), 9.

41. Ibid., 147.

42. *Conduct of the Persian Gulf War,* 355, 358. The size and readiness of each division varied widely.

43. Heinz Guderian, a German general in World War II, led blitzkrieg operations in Poland, France, and Russia.

44. Khaled bin Sultan with Patrick Seale, *Desert Warrior: A Personal View of the Gulf War by the Joint Forces Commander* (New York: HarperCollins, 1995), 409.