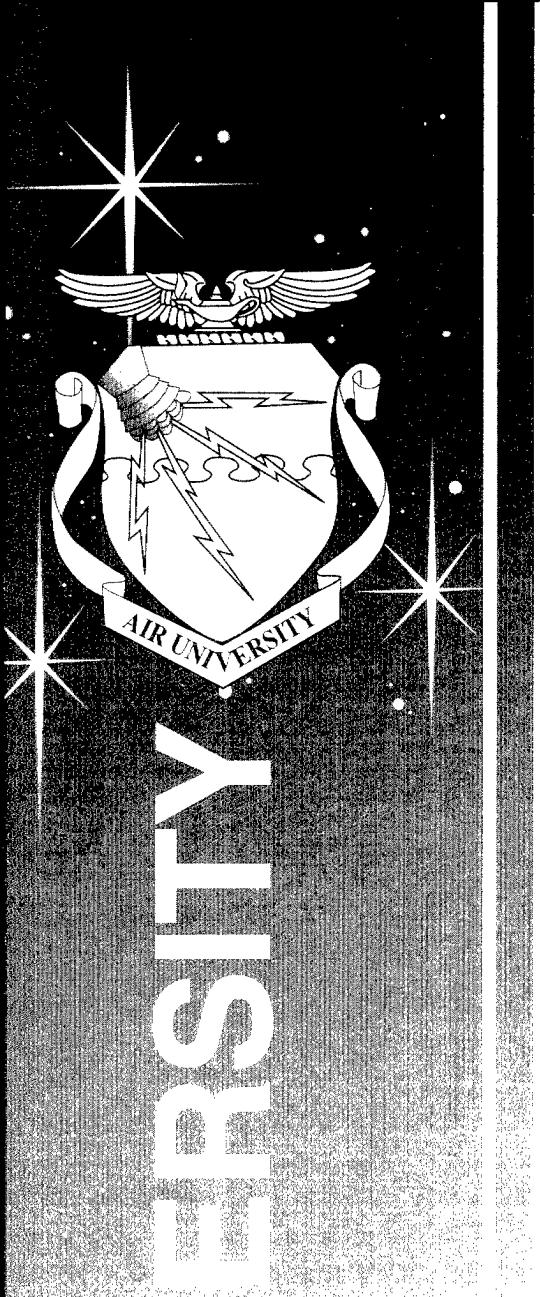

Fighting with a Conscience

The Effects of an American Sense of Morality on the Evolution of Strategic Bombing Campaigns

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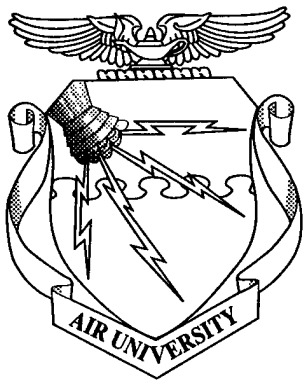

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Contents

Abstract

In the 1930s air leaders and theorists at the Air Corps Tactical School developed a new concept for strategic bombing that sought victory through attacks on an enemy's war-making potential instead of its deployed forces. School officials believed such attacks directed against a country's economic "vital centers" or "industrial web" would destroy not only the ability to wage war but the will to fight as well. The concept also reflected a uniquely American sense of morality, as it included the notion that capability and will could be destroyed without directly attacking civilians. Those ideas coalesced into the doctrine for the strategic bombing campaigns of World War II. That doctrine influenced both strategy and tactics and in the process made the American air effort predictable.

The bombing campaigns against Germany and Japan were remarkably similar, although conducted in different areas of the world under unique circumstances. Air leaders in both theaters initially relied on high-altitude, daylight precision attacks directed at the enemy's industrial web. When faced with similar problems of poor weather, inaccurate bombing, deadly defenses, and surprisingly resilient enemies, they resorted to less precise bombing methods. Even then air commanders refused to abandon their humanitarian principles. The attacks continued against industrial web targets, but with more indiscriminate methods that were nonetheless motivated by the desire to shorten the war and save lives on both sides. The emphasis on morality remained part of America's strategic bombing doctrine after the war.

Air leaders directing bombing campaigns against North Korea, North Vietnam, and Iraq faithfully ascribed to the industrial web theory, attacking similar targets in each conflict in predictable fashion—with bombing methods designed to avoid civilian casualties. Each campaign appeared successful, employing increasingly accurate bombing methods that improved effectiveness while reducing civilian casualties. Those perceived successes reinforced World War II convictions that strategic bombing could be decisive. As a result, future air campaigns will likely remain predictable, continuing to focus on attacking the enemy's industrial web to destroy its capability and will to fight.

The predictable nature of American strategic bombing may make it vulnerable to a perceptive enemy. By offering him the opportunity to design, test, and employ countermeasures, American air commanders may have inadvertently limited their ability to achieve success.

About the Author

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Chapter 1

Introduction

As midnight approached on 16 January 1991, the roar of jet aircraft suddenly broke the stillness of the Saudi Arabian desert. Wave after wave of aircraft followed, until hundreds were heading north into Iraq in search of their targets. Operation Desert Shield had ended; Operation Desert Storm had begun. During the next 43 days and nights, coalition air forces adhered to an American air campaign plan as they pounded targets in Iraq and Kuwait with more that 88,000 tons of bomb and caused a miraculously small number of civilian casualties.[1] The three thousand civilian deaths in Baghdad, while regrettable, were also the lowest number of deaths from the bombing of a major city in the history of modern war.[2] Television images of bombs flying unerringly into the air shafts, doors, and windows of Iraqi military targets graphically illustrated the power and precision of the bombing offensive. The images also illustrated an ironic—and uniquely—American method of employing strategic air power that dates back to World War II. American air commanders have consistently attempted to bring conflicts to a rapid conclusion by destroying an enemy's capability and will to resist, while at the same time a sense of morality has tended to preclude direct attacks on civilians and to temper the severity of air campaigns.

The Desert Storm air war conformed to the established pattern. The air campaign in the Persian Gulf was "the most awesome and well-coordinated mass raid in the history of air power" according to former Air Force Chief of Staff, Gen Michael J. Dugan. "[It] began with massive direct attack on strategic targets . . . that have a long-term impact on the ability of [Iraq] to conduct war." General Dugan also pointed out that the attacks targeted Iraqi will power. "Iraq is not a backward agricultural society; it is an industrialized and urbanized country with well-educated people. Some ten years of industrial development is being demolished, and Iraqis should see that their lives are being made miserable."[3] The campaign employed the most advanced, precise weapons available against carefully selected targets to avoid collateral damage and civilian casualties. The desire to avoid civilians often caused American pilots to fly routes that put themselves at great risk from enemy air defenses.[4] Gen H. Norman Schwarzkopf, commander in chief, United States (US) Central Command, stated in a television interview during the war that, "We have been very, very careful in the direction of our attack to avoid damage of any kind to civilian installations. It's going to happen; it's absolutely going to happen; there's no question about it, but we're doing everything we can to avoid it."[5]

Attacks on a command bunker, resulting in more than 300 civilian deaths, shocked and surprised Americans and seemed to cause genuine remorse. The bombing campaign was so accurate, and so morally con-

strained, that according to General Schwarzkopf, the Iraqi military was able to use it to their advantage.

> We are not indiscriminately targeting civilian targets and I think that the very action of the Iraqi's themselves demonstrates that they know damn well that we're not attacking civilian targets. Since right now they've dispersed their airplanes into residential areas, they've moved their headquarters into schools, they've moved their headquarters into hotel buildings, [and] they've put guns and things like that on top of high rise apartment buildings. Under the Geneva Conventions that gives us the perfect right to go after those things if we wanted to and we haven't done it.[6]

The 43-day bombing of targets in Iraq was a strategic air campaign, although the term "strategic" is often used to refer to many types of air warfare. Historically, bombing missions fall into two basic categories, tactical and strategic. Tactical bombardment provides direct support to Army, and at times, Navy operations by attacking enemy forces on or near the battlefield. This type of bombing will quickly affect the battlefield situation. Strategic bombing, on the other hand, is not aimed at the enemy forces arrayed on the battlefield. Instead, it targets the sources of the enemy's military power and is intended to have long-term effects. Strategic attacks, according to the official doctrinal manual of the US Air Force (USAF), "are carried out against an enemy's centers of gravity including command elements, war production assets, and supporting infrastructure (for example, energy, transportation, and communication assets). Strategic attacks should be designed to be persistent and coordinated so as to affect the enemy's capability and possibly his will to wage war."[7] This notion of strategic bombing, refined at the Air Corps Tactical School (ACTS) during the 1930s, asserts that an enemy's war-making capability can be destroyed by precisely attacking key elements of the enemy nation's industrial apparatus. Generally, these elements consist of factories and transportation links. Throughout the history of American strategic bombing, the emphasis has remained on a "scientific" approach to identifying the key war-fighting elements of an enemy nation, and those elements have consistently been identified as structures and machinery, not people.

This emphasis on a scientific approach to bombing has complemented America's notion that war is a "moral crusade." Americans have traditionally viewed war as an evil that they engage in reluctantly. While their goal has been to defeat an enemy, it has also been to achieve victory without sacrificing the principles of democracy and humanity that are the cornerstones of the American republic. Once involved in a conflict, though, Americans have sought to use their resources to annihilate the enemy's armed forces in short order, while also attempting to limit the direct effects of war on innocent civilians. Therefore, a strategic bombing campaign, planned and executed by American air leaders imbued with this sense of morality would focus on bombing only military targets, and only in a manner that would avoid harming any civilians. For example, civilian morale is often considered a legitimate military target that is especially vulnerable to attack from the air. Bombing campaigns guided by an American ethics might pursue this target, but only through indirect means such as bombing electric power plants, water supplies, or trans-

portation networks. Although this concept of indirectly attacking civilians may appear hypocritical, it does indeed conform to a uniquely American moral code that traces its roots to the campaigns of Gen William T. Sherman in the American Civil War.

In 1864 General Sherman wreaked great havoc on the Southern populace as he marched through Georgia and the Carolinas. During the advance, Sherman ordered his troops to "forage liberally," destroying crops and livestock and burning homes to punish Southerners for supporting the Confederate cause, yet he forbade the killing of civilians.[8] He explained his purpose in a letter to a subordinate officer: "If the people raise a howl against my barbarity and cruelty, I will answer that war is war, and not popularity seeking. If they want peace, they and their relatives must stop the war."[9] He later added, "We cannot change the hearts of those people of the South, but we can make war go terrible . . . [and] make them so sick of war that generations would pass away before they would again appeal to it."[10] Finally, in a letter to the mayor of Atlanta he wrote, "I want peace, and believe it can only be reached through union and war, and I will ever conduct war with a view to perfect and early success."[11]

General Sherman's sense of morality typified that later displayed by American air commanders. He approved of harsh methods that, while causing great pain and suffering among the Southern populace, were morally acceptable because they did not directly attack civilians. His campaign through the South was designed to simultaneously destroy the South's capability to wage war and its will to do so. His ethical code parallels that of the US Army Air Forces' officers as they developed the doctrine for the strategic bombing campaigns of World War II. Their desire to avoid civilian casualties while attacking the enemy's capability and will to fight determined both strategy and tactics—and, in so doing, made American bombing predictable. The complementary elements of morality and predictability have endured throughout the history of American strategic bombing.

Notes

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2. Erika Munk, "The New Face of Techno-war," *The Nation*, 6 May 1991, 583–86.

3. Michael J. Dugan, "The Air War," *U.S. News & World Report*, 11 February 1991, 24–31.

4. Richard Homan, "Report Says U.S.–Led Air Campaign against Iraq Violated 'Laws of War,'" *Washington Post*, 17 November 1991.

5. Television interview, *Biography*, The Arts and Entertainment Network, 1991, documentary.

6. Ibid.

7. Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, vol. 1, March 1992, 11.

8. James M. McPherson, *Battle Cry of Freedom: The Civil War Era* (New York: Oxford University Press, 1988), 809.

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11. Sherman, 602.

Chapter 2

The Early Years and World War I

Shortly after the Wright brothers proved that heavier than air flight was possible, men began discovering innovative uses for their new flying machines. Many of the new ideas conceived during the decade following the *Kitty Hawk* experiments had military applications, but their value was unknown until they were tested in the crucible of combat. The notion of strategic bombing was untested, and the assertion that aircraft could be used to wreck a nation's morale and shorten a war was unproven. The conviction remained unsubstantiated after World War I. Although many American air leaders adopted this belief, they never had an opportunity to test the theory during the conflict.

The potential to destroy civilian morale through strategic bombing had been foreseen long before the airplane became a reality. As early as 1893 a British officer visiting Chicago predicted the day when "the arrival of the aerial fleet over the enemy capital will probably conclude the campaign."[1] When Capt William Crozier, the American delegate to the 1899 Hague Conference, argued against a permanent ban on the discharge of projectiles from aerial vehicles, he hoped that an effective air weapon would limit warfare. He stated the potential ability of air weapons to localize the destruction of life and property might "decrease the length of combat and consequently the evils of war."[2] As airplanes became more common, the predictions of attacks on civilian populations became more believable and much more detailed. In 1914 American aviator and winner of the 1912 Michelin bombing competition, Riley E. Scott, predicted that it would be relatively easy to conduct a devastating air attack against New York City. He stated that "no great accuracy would be needed in the congested areas, and the loss of life from fire, high-explosive bombs, and panic would be appalling."[3] He went on to describe other scenarios where the panicked populations forced their leadership to surrender to end the terror of the bombing. Such unsubstantiated assertions held out the alluring promise that the fear of air attacks on civilian populations would eliminate—or at least significantly shorten—future wars. These theories would remain not validated by World War I.

Before the United States entered the war, aerial attacks on civilians had occurred, but only on a small scale. Of the belligerents, Germany was most prepared to conduct bombing attacks on enemy civilians. Zeppelins flew the first raids against England in early 1915, but conducted only 54 attacks because of stern British defenses. The retirement of the Zeppelin fleet to less dangerous duties did not end the bombing of English cities. The Germans turned to aircraft on 25 May 1917, when 22 Gotha bombers attempted to bomb London. The raids continued through September 1917, with night attacks occurring near the end of the campaign. Although the target of choice never shifted from central London, the raids

produced little physical damage and had no effect on the outcome of the war. But the raids did influence the American Air Service.[4]

Gen Benjamin D. Foulois, chief of Air Service, American Expeditionary Forces, was impressed by the results of two German air raids on London he observed in December 1917. Although the raids were conducted by a small number of aircraft which only dropped about 40 bombs, to General Foulois the effect on British morale seemed out of proportion to the meager physical damage. He witnessed hundreds of people sleeping in underground railway stations. Factory work stopped during the raids.[5] If German air raids had so terrorized the citizens of London, it seemed logical that allied raids against German cities could also be effective.

Meanwhile, Lt Col Edgar S. Gorrell put the finishing touches on a strategic bombardment plan for the US Air Service. Gorrell's strategic bombing plan was surprisingly detailed and included a section on attacking the morale of German citizens. Although Gorrell did not believe morale was the most significant target in Germany, he did acknowledge its importance. He explained that if several German cities were subjected to massive air raids, it was possible that a city which had not been attacked would "create such trouble that the German Government might be forced to suggest terms if that town were so attacked." He also explained why he deemed German morale vulnerable to an air assault. "Germany has shown by her attempts to wreak havoc with the morale of the Allied nations, in such cases as the bombardment of London, that her own human nature lends itself to having havoc wreaked with it in a similar manner."[6]

Gorrell's plan, approved by Foulois in early December 1917, provided the early seeds for American air doctrine. At that point, enemy civilian morale became an approved target for attack, much like Sherman had designated Confederate morale for attack over 50 years earlier. Yet obtaining approval for Gorrell's plan would prove to be much easier than actually putting it to use against the Germans.

Implementing Gorrell's strategic bombardment plan required enormous amounts of manpower and material. These requirements were beyond the capability of the United States, and the war ended before Gorrell's scheme could become a reality. It was impossible for Air Service officers to draw accurate conclusions about the value of using strategic bombing to attack civilian morale because it played such a small role in the war. World War I bombing suggested that the idea of attacking civilians to damage their morale had great potential for rapid success, but it did not conclusively prove that point. There were some examples that civilian morale stiffened under repeated air attacks, especially in England. "The recurrence of the dangers has tended not to exaggerate those dangers, as the enemy hoped fondly would happen if attack followed often upon attack, but rather has made the circumstances more tolerable."[7] This perception was not typical, however, and when the war ended most airmen believed that civilian morale was vulnerable to direct air attack. A definite answer about the value of strategic bombing and attacking civilians would require a more comprehensive test.

Reflecting on the war during the 1920s, Gen William "Billy" Mitchell stated, "I was sure that if the war lasted air power would decide it."[8] But

the war ended and the US Air Service entered the postwar period with untested ideas about strategic bombing. One of those ideas was the belief that civilian morale was a legitimate military target, and that bombing could crack it. Attacking civilian will to fight appeared to be a viable alternative to bloody drawn-out land battles. This faith would contribute to the development of American strategic bombing doctrine during the decades between the world wars, although ideas on how best to attack civilian morale would not remain constant.

Notes

1. Michael S. Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven, Conn.: Yale University Press, 1987), 4.
2. Lee Kennett, *The First Air War: 1914–1918* (New York: Free Press, 1991), 2.
3. Ibid., 45.
4. Ibid., 57–61.
5. Maurer Maurer, ed., *The U.S. Air Service in World War I*, vol. 2 (Washington, D.C.: Government Printing Office [GPO], 1978), 162.
6. Ibid., 141 and 150.
7. Kennett, 62.
8. Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm, 1917–1941* (Washington, D.C.: GPO, 1985), 13.

Chapter 3

The Interwar Years

The two decades following World War I were critical to the development of the American strategic bombing doctrine for World War II. A powerful influence on air commanders was the horror of the First World War, which caused great revulsion in civilian as well as military leaders. Bombing seemingly offered a means to end conflicts quickly and avoid the stalemate of trench warfare. Air Service leaders found that prospect difficult to resist. They were convinced that a few more months of fighting would have proven airpower decisive in World War I.[1] They also felt it had the potential to be the decisive force in any future war. In the 1920s and the 1930s Air Service leaders set out to create a strategic bombing doctrine and strategic bombing force that reflected their strong belief in the potential of airpower.

Yet the prospect of strategic bombing was not uniformly viewed as desirable in the event of another war. In 1919 Secretary of War Newton D. Baker criticized strategic bombing in his annual report to the president, stating that it was an uncivilized act that violated ethical and humanitarian behavior. He went on to say that its effects were militarily insignificant and "there was no place for strategic bombardment as in modern war."[2] Secretary Baker's view of strategic bombing was not unique. In fact, it reflected the overwhelming opinion of most Americans. The American public's antiwar convictions following World War I, were so strong that airpower advocates seeking support for long-range bombers could only mention enemy military objectives as targets. The American people would not have supported a program advocating the terror bombing of civilians. Their ethical concerns contributed directly to the development of a precision bombing philosophy that rejected cities and their citizens as targets. Although American air leaders remained convinced of the value of strategic bombing, they developed a bombing doctrine that conformed to the moral code articulated earlier by General Sherman.[3]

One officer who steadfastly believed in the value of strategic bombing was General Mitchell, the chief of the Air Service's Training and Operations Group after World War I. He was certain that airpower could make the most important contribution to the nation's defense, and that an "air force" should be recognized as a separate service with identical status to the army and navy. He presented many arguments advocating an independent air force, but two of the most significant were the superiority of air forces over naval forces and the ability of air forces to place an entire nation at risk by flying over battlefields to strike deep at the enemy's "vital centers." When Mitchell's airmen sunk a captured German cruiser and battleship in the bombing tests of 1921, they believed that they had proved precision attacks possible and demonstrated the supremacy of airpower. Before conducting the tests Mitchell wrote, "Aircraft possess the most powerful weapons ever devised by man. They carry not only guns

and cannon but heavy missiles that utilize the force of gravity for their propulsion and which can cause more damage than any other weapon."[4] The precise attacks by his bomber added credence to that statement.

Mitchell also focused on the fact that the Air Service was the only branch of the armed forces capable of destroying the enemy's war-making means. Not only would enemy soldiers be targeted but also those areas of the enemy's country that supported its ability to make war: industries, communications, food production, oil storage facilities, and workers' homes. Strategic bombing could render the country incapable of supplying its armed forces and also discourage the people's desire to keep fighting. In advocating attacks on civilians, General Mitchell explained in 1925 that his concept of war would actually be humane because it would shorten future wars, eliminating years of fighting and millions of casualties. He also described an early form of deterrence by explaining that strategic bombing would prevent future wars, since civilians would personally experience the effects of warfare and would be less inclined to renew the fighting.[5] General Mitchell continued arguing to fight for a strong, independent air arm for many years, but his days in uniform were numbered. By the time he was court-martialed in 1925, he had helped mold American strategic bombing doctrine. His emphasis on precision bombing, and his contribution to the concept of attacking a nation's industry to destroy its war-making capability had lasting effects.

In the 1930s, American air leaders and theorists used Mitchell's ideas, as well as those of Italian theorist Giulio Douhet and Maj Gen Sir Hugh M. Trenchard, the first commander of the Royal Air Force (RAF), to refine US strategic bombing doctrine. Of the three, the most important in the United States was General Mitchell, whose ideas continued to shape the Air Corps after his retirement.[6] His influence was reflected in courses taught at the Air Corps Tactical School. ACTS, which moved from Langley Field, Virginia, to Maxwell Field, Alabama, was considered the Air Corps' center for doctrinal thought. One function of the school was to develop new ideas and coordinate them into a consistent body of doctrine. As early as 1926 the ACTS outlined a strategic bombing concept designed to destroy the "enemy's morale and will to resist, preferably by means of attack on the interior." A text written in 1934 "established national morale and industry as more crucial objectives than enemy armies. The easiest and cheapest way to win a war was thought to be by air attack upon the enemy's population and production facilities." Mitchell would have agreed with the target categories and would have likely called for indiscriminate "area bombing" tactics against them.

The ACTS, however, had begun to develop a new concept for strategic bombing. It called for daylight, precision attacks against carefully selected key points in the industrial structure of an enemy nation.[7] School instructors believed that a nation's industry was a complex organization, with many interdependent elements. An attack against one element of this industrial web would interrupt the delicate economic balance of the nation, destroying war-making capability and the essentials of modern life, and thereby force that nation to surrender.[8] The concept was reinforced when a flood in the early 1930s practically stopped the entire aircraft industry of the United States. The deluge had closed a small indus-

trial plant in Pittsburgh that made a special spring used in controllable pitch propellers. When the available supply of springs was depleted, the propeller manufacturer was forced to halt delivery and all aircraft production stopped "as effectively as if a considerable number of factories had been [bombed]."[9] The industrial web theory quickly gained acceptance at the ACTS, forming the essence of strategic bombing doctrine that guided American air campaign planning in World War II.

The ready acceptance of the industrial web theory was due to several factors. One of the most important was the American sense of morality. During the interwar years, Americans had come to view ruthlessness in war as morally unjustified. No military doctrine, rationale, or reasoning of any kind could possibly condone the deliberate killing of "innocent civilians." Such an objective appeared inconceivable to the American public.[10] The indiscriminate area bombing of European and Asian cities added to the public's condemnation of unrestrained air war. In the late 1930s the Japanese bombed cities in China, the Germans bombed cities in Spain and Poland, and Russia bombed cities in Finland. The attack on Nanking, China, in September 1937 prompted a response from the US government to the Japanese that read, "This Government holds the view that any general bombing of an extensive area wherein there resides a large populace engaged in peaceful pursuits is unwarranted and contrary to the principles of law and humanity."[11] The declaration was ignored by the Japanese government and went largely unnoticed in the remainder of the world.

Another factor influencing the development of precision bombing doctrine was the traditional American respect for marksmanship that "went back to the squirrel rifle of frontier days when scarcity of powder and shot put a premium on accuracy. It was an element of American folklore which could be taken over by analogy to the new weapon."[12] A related concern was an early Air Corps interest in precision bombing for the coastal defense mission. Although successful ship attacks demanded great precision, General Mitchell had demonstrated their feasibility with primitive equipment in the early 1920s. It was this requirement that led to development of the Sperry bombsight. In 1931 a more capable bombsight, the Norden Mark XV, was demonstrated to the Army and ordered in 1933, along with improved versions of the Sperry model.[13] The Air Corps' ability to deliver a large bombload precisely was greatly enhanced when the B-17 bomber was successfully tested in 1935. At that point, the Army Air Corps finally had the basic tools to put precision strategic bombing theory into practice.

That doctrine, founded on the industrial web theory, was highlighted at the Air Corps Tactical School during the late 1930s. A 1935 ACTS text called for an analysis of the enemy's economy to determine those relatively few objectives whose destruction would wreck the nation's ability to wage war. It went on to state that an attack on these targets would also disrupt civilian life to such an extent that the population might react by forcing the government to sue for peace.[14] In 1939 Maj Muir S. Fairchild, an ACTS instructor, stressed the industrial web theory in a lecture. He also explained why direct attacks on civilians should not be a part of a strategic bombing campaign.

> In general, the direct attack of populations gives temporary effects only and these are not necessarily cumulative. Furthermore, aside from the psychological effects on the workers, this attack does not directly injure the war making capacity of the nation. For all of these reasons the school advocates an entirely different method of attack. This method is the attack on the national economic structure. The school believes that this method of attack is more in keeping with our humanitarian ideals . . . [and it] has the great virtue of reducing the capacity for war of the hostile nation, and of applying pressure to the population both at the same time and with equal efficiency and effectiveness.[15]

The destruction of civilian morale was still considered an important objective of a strategic bombing campaign, but American ethics would not condone direct attacks against enemy civilians. Doctrinal thought at the ACTS had taken its final evolutionary steps prior to World War II. All that remained was to translate the doctrine into a plan of operations, and that happened during nine days in August 1941.

On 4 August members of the Air War Plans Division (AWPD), a new agency within the Air Staff, began to develop an estimate of Army Air Forces' needs in the event of a potential war against the Axis. The plans focused on defeating Germany first as a result of "ABC-1" meetings between American and British chiefs of staff in the spring of 1941. The United States would depend primarily on its Pacific Fleet to maintain a defensive against Japan in the Far East. The chiefs also stated the Allies were to build up their bomber force for an air offensive against German military power.[16]

The key individuals charged with designing the air offensive against Germany consisted of Lieutenant Colonels Harold L. George and Kenneth N. Walker and Majors Laurence S. Kuter and Haywood S. Hansell. All had been instructors at the ACTS, and all were strong believers in the school's concept of strategic bombing.[17] The group had only been tasked to "determine the maximum number of air squadrons that the Army Air Forces might ultimately require to garrison a great number of geographic sites and to hold as reserves of opportunity."[18] However, they took advantage of the opportunity to create a detailed air plan for the defeat of the axis powers known as AWPD-1.

In little over a week they created a plan based on the "application of air power for the breakdown of the industrial and economic structure of Germany." This result would be accomplished by selecting a "system of objectives vital to the continued German war effort and to the means of livelihood of the German people, and *tenaciously concentrating all bombing* toward the destruction of those objectives."[19] The plan called for the destruction of 154 targets divided into four target systems: German Air Force, electric power, transportation, and synthetic oil production.[20] The group also felt German civilian morale was an important target and would suffer as a result of the bombing. According to Hansell, Americans planned to undermine German morale, but believed that the loss of will would result from the "loss of war-supporting and life-supporting systems."[21] Yet the plan also included the idea that area bombing of civilian concentrations might be effective once German morale began to crack. It is important to note that such an attack was given a very low priority, and would occur only under certain conditions. The plan stated as follows:

> Timeliness of attack is most important in the conduct of air operations directly against civil morale. If the morale of the people is already low because of sustained suffering and deprivation and because the people are losing faith in the ability of the armed forces to win a favorable decision, then heavy and sustained bombing of cities may crush that morale entirely. However, if these conditions do not exist, then area bombing of cities may actually stiffen the resistance of the population, especially if the attacks are weak and sporadic.[22]

Hansell later noted that the creators of AWPD-1 did not have much faith in the effectiveness of attacks on civilian morale. "It was a concept much discussed and generally discarded at the Air Corps Tactical School. AWPD-1 itself was dubious of the effectiveness of this approach except as a last resort or in the final stages of enemy resistance."[23] The plan was finished on 12 August 1941 and submitted to the Army's War Plans Division for approval. Its completion "marked both the apex of prewar air force doctrinal thought and blueprint for the air war that would follow."[24]

Although AWPD-1 was modified less than a year after its acceptance, its basic concepts survived the war. It remains a remarkable document, representing years of doctrinal evolution and thought. From untested theories and the limited lessons of World War I, the Army Air Corps developed a unique approach to strategic bombing that reflected many convictions, not the least of which was a sense of morality. The United States planned to respond to the next war with a sustained air offensive, aggressively attacking the enemy with a precision bombing campaign directed against production centers rather than the civilian populace. This humanitarian approach to air war would receive its first test in the skies over Germany.

Notes

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3. Ibid., 15.
4. William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power* (New York: G. P. Putnam's Sons, 1925), 125–27.
5. Ibid., 4.
6. Greer, the influence of Maj Gen Sir Hugh M. Trenchard is discussed on p. 9, and that of Giulio Douhet is found on pp. 48–51.
7. Ibid., 48–57.
8. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 1, *Plans and Early Operations, January 1939 to August 1942* (1949; new imprint, Washington, D. C.: Office of Air Force History, 1983), 52.
9. Greer, 81, citing Gen Haywood S. Hansell Jr.'s, 19 September 1951 lecture at the Air War College, Maxwell Air Force Base (AFB), Ala., titled "The Development of the US Concept of Bombardment Operations," 10–12.
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11. *New York Times*, 29 September 1937.
12. Craven and Cate, 597.
13. Ibid., 598.
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20. Ibid., 35.
21. Haywood S. Hansell Jr., *The Air Plan That Defeated Hitler* (Atlanta, Ga.: Higgins-McArthur/Longino & Porter, 1972), 249.
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Chapter 4

World War II: The European Theater

The American strategic bombing offensive against Axis Europe began on 17 August 1942, when 12 B-17s conducted a daytime raid against the French railroad marshalling yards at Rouen-Sotteville. Personally leading the mission was the Eighth Air Force commander, Maj Gen Ira C. Eaker, who characterized the raid as a success.[1] The B-17s accurately bombed the target and all aircraft returned to England. The doctrine of daylight, precision bombing had begun its trial by fire and the first results looked good. But the initial impression was premature, and future raids would challenge American confidence in the theory. Inaccurate bombing, prohibitive losses, poor weather, and a questioning Ally put intense pressure on Eaker and his commander, Lt Gen Carl A. Spaatz, to abandon their doctrine in favor of the British method of area bombing. However, Army Air Forces leaders, convinced that their doctrine and its humanitarian approach to air warfare were sound, successfully resisted the pressure and continued conducting daylight, precision attacks until the end of the war in Europe.

The British concern for American strategic bombing doctrine had its roots in RAF daylight bombing experiences in 1940–41. At one point in the summer of 1941, the RAF actually used B-17s equipped with Norden bombsights.[2] The British had also witnessed the German Luftwaffe abandon daylight attacks in favor of night missions. Both the British and German bomber fleets proved vulnerable to determined fighter aircraft attacks, and neither air force could afford the crippling losses that resulted. The British were convinced the American doctrine would lead to similar results. During a trip to England in early 1941, Gen Henry "Hap" Arnold received a series of briefings on the difficulties of daytime bombing. Some of the briefers were British pilots who had flown daylight bombing missions and were convinced precision attacks were impossible. They believed that the evasive maneuvers required to elude German defenses did not allow straight and level flight long enough for accurate aiming. General Arnold remained unpersuaded, and later commented that it was his first introduction to a "general campaign that later developed into an official deprecation of our daylight bombing and a constant nagging effort to get us to go along with the RAF in their night bombing."[3]

After Pearl Harbor, the Army Air Forces remained committed to its precision bombing doctrine. When General Eaker arrived in England in early 1942, he faced many problems, but none more challenging than the one presented by Air Marshal Sir Arthur Harris, commander in chief, RAF Bomber Command. Harris was determined to force the American bombers into joining the RAF Bomber Command in night area attacks against German cities.[4] Eaker diplomatically and steadfastly refused to accept Harris's plan, but opposition to the American doctrine continued.

The Americans had several reasons to resist the pressure. They considered the British and German bombing experiences irrelevant, because neither air force employed formation bombing tactics. Although American tactics were not thoroughly tested, US airmen were convinced the heavily armed B-17s and B-24s, flown in tight formation, could successfully defend themselves against enemy fighters. They also argued that until the doctrine proved itself faulty, any decision to change it would be premature. Moreover, all US bomber training and equipment was designed for daylight, high-altitude, precision bombing. A premature decision to abandon daylight bombing would create an enormous expense and lose a great deal of time changing equipment and retraining crew members. Finally, and most important, the airmen were simply unwilling to adopt the indiscriminate bombing practices of the British. Not only were they unwilling, they were "horrified" by the British bombing campaign. "There must be a way, they felt, to apply force more selectively."[5]

The differences in the two approaches surfaced again at the Casablanca Conference in January 1943. During early discussions between Prime Minister Winston S. Churchill and President Franklin D. Roosevelt, Churchill appeared to persuade Roosevelt that America should join the RAF in night bombing. When General Arnold explained the situation to General Eaker, Eaker reacted with anger and dismay. "He told General Arnold that if he, Arnold, was prepared to abandon his objective and adopt an air strategy that could neither paralyze Germany's war-making industry nor make feasible an invasion, he, Eaker, wanted no part of it, and Arnold could find another air commander."[6] Instead of finding another air commander, Arnold directed Eaker to present his arguments against an American night bomber force to the prime minister. The meeting occurred a few days later and Eaker convinced Churchill that the Army Air Forces should continue conducting daylight bombing.[7] In a letter written to General Spaatz, Eaker explained, "We must never allow the record of this war to convict us of throwing the strategic bomber at the man in the street."[8]

Acknowledging Eaker's sentiments, the Casablanca Conference produced the Casablanca directive, a document that outlined a combined strategic air campaign against Germany. It stated that "the ultimate objective of the air campaign was to be the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to the point where their capacity for armed resistance is fatally weakened."[9] RAF Bomber Command interpreted the Casablanca directive differently than the Army Air Forces, reflecting basic differences both in their approach to strategic bombing and in their view of "moral" warfare. To RAF commanders, the statement "did not necessarily entail killing large numbers of people. It did entail depriving them of homes, heat, light, water, urban transportation, and perhaps food." The Americans, in contrast, "looked upon the progressive destruction and dislocation of the German military, industrial, and economic system as the path to the fatal weakening, and believed it could best be done by destroying selected targets in Germany."[10] The difference in interpretation centered around method. Both bomber commands considered civilian morale an important target, but they differed in

the means to bring it under attack. The British favored directly attacking enemy civilians to damage their morale, while the Americans favored attacking industrial targets to get the same results. Joining the British in a night bombing campaign would mean adopting their tactic of directly attacking civilians. American air leaders refused to compromise; however, as the American air war intensified, more compelling pressures to abandon both doctrine and morality soon appeared.

One source of that pressure was a statement made by the Allied leaders soon after the Casablanca Conference. On 23 January Roosevelt and Churchill announced that they would not end the war until they had forced the Axis nations to accept "unconditional surrender." President Roosevelt was especially enamored with the term because it seemed to simplify Allied political goals, but American military leaders "viewed it as an unfortunate war aim that would make the people of Germany and Japan resist to the bitter end." Influenced by the unconditional surrender goal, American air planners ultimately created air campaigns designed to eradicate the Axis governments and their means of support.[11]

In the summer and autumn of 1943, the Eighth Air Force began conducting bombing missions against targets deep inside Germany, often employing formations of 200 or more aircraft. Two key problems confronted the bomber force: bad weather and enemy fighters. Although poor weather was no new problem to the bomber crews, it was particularly vile from November 1943 to February 1944. Throughout the period there were less than half a dozen days suitable for visual bombing, effectively grounding the bombers and halting the bombing campaign.[12] On the few days the bombers were able to fly they faced increasingly deadly enemy defenses. The bombers exceeded the range of their fighter escort shortly after entering German airspace, leaving them vulnerable to enemy fighters. The Luftwaffe took advantage of the situation and attacked with a vengeance, causing severe losses.

The losses had steadily mounted prior to the onset of horrid weather. On 17 August in a double attack on the ball bearing plants at Schweinfurt and a fighter aircraft factory at Regensburg, 60 bombers had been lost out of a force of 376. Schweinfurt was attacked again on 14 October with equally disastrous results. Of the 291 bomber force, 60 failed to return, 17 suffered major damage, and 121 returned with repairable damage. Other harrowing missions were flown in October and in a space of six days, additional 88 bombers and crews were lost, mostly to enemy fighters. The cost was unacceptable. Eighth Air Force made no more deep penetrations into Germany for the rest of the year.[13]

The problem of excessive losses to German fighters was solved in the spring of 1944 with the arrival of long-range escort fighters. By March 1944, P-51 fighters escorted bombers beyond Berlin and the tide of the air battle began turning in favor of the attackers.[14] A diminished enemy fighter threat increased the strength of the bomber force, but its effectiveness was still hampered by the lack of a solution to the foul weather problem. As the winter of 1944 approached, "the typically horrid flying weather over Germany returned. Yet by then the potential force available to [Army Air Forces commanders] was so great . . . that it was unthinkable not to use the bombers simply because visual bombing was not possible."[15] This

feeling was especially strong given the difficult task of supporting the goal of unconditional surrender. Army Air Forces leadership attempted to solve the problem by using airborne radar to locate targets when the weather prevented visual attacks, but the radar was not accurate.

Early experiments with radar bombing had begun in 1942, although large-scale use by Americans did not begin until late 1943.[16] Radar bombing never developed the precision of visual bombing, and for that reason, Americans considered it only a supplement to daylight bombing that allowed continued pressure on Germany. According to the official history of the Army Air Forces in World War II, the inaccuracy of radar "involved some compromise with the doctrine of precision bombing." It was impossible to identify specific targets "unless they happened to be unusually isolated and unusually extensive. But it seemed better to bomb . . . even with less than precision accuracy, than not to bomb at all."[17] No matter what reasons are given for using radar, it simply did not fit into a doctrine of precision bombing. The more the Army Air Forces used radar bombing, the more it drifted towards attacks "characterized by techniques reflecting area rather than precision attack."[18]

Although American radar bombing results resembled British area bombing, the intent was quite different. In fact, it can be viewed as an attempt, influenced by many factors, to continue the bombing campaign using the most scientific, efficient, and moral means possible. Gen C. P. Cabell, Eighth Air Force director of plans, adopted this point of view to justify radar bombing. He said it was "imperative to develop the equipment and techniques to use, in battle, radar bombing so as to make ours an all-weather force. This would be needed in Japan, in future wars, and even currently in the European Theater in the event that the German jet fighter should have materialized as feared." He continued, "To me the test was whether or not our bombing was wanton. I do not think it was, in spite of many urgings by all kinds of people—not just the military—for all kinds of bombing operations."[19] Radar bombing put continuous pressure on the German war machine that was deemed critical to the successful conduct of the air campaign. It was the most accurate method available to attack the enemy in bad weather, and it was a method of applying continuous pressure to end the war as quickly as possible to save lives. Yet it was, without doubt, less accurate than visual bombing. However, it was not, nor was it ever intended to be, a resort to indiscriminate area bombing.

In June 1944 the British once again pressured Spaatz to abandon all pretense of a precision bombing campaign and urged US participation in an operation code-named Thunderclap. The problems Army Air Forces leaders faced executing this operation are representative of the types of problems that they faced throughout the war, as they attempted to reconcile moral concerns with the goal of unconditional surrender.

Operation Thunderclap was planned by a joint intelligence committee that proposed to attack German civilian morale directly by delivering 20,000 tons of bombs in a four-day and three-night, round-the-clock blitz against the administrative center of Berlin. The operation was planned partly in response to the V-1 attacks on England, and partly because the British chiefs of staff felt the time had come when an all-out attack on

enemy morale might be decisive.[20] The final draft of the plan called for "2,000 Eighth Air Force bombers to drop 5,000 tons, under visual conditions, on a 2 and one-half square mile area of central Berlin, estimated to contain a daytime population of 375,000. The bomb density of 2,000 tons per square mile might produce 137,500 dead and 137,500 seriously injured."[21] In July 1944 General Spaatz, now commander of the US Strategic Air Forces in Europe, was briefed on Thunderclap. He informed General Eisenhower: "I am opposed to this operation as now planned. We are prepared to participate in an operation against Berlin, but in so doing will select targets for attack of military importance." Eisenhower agreed and reassured him that "we will continue precision bombing and not be deflected to morale bombing."[22] Spaatz also had an opportunity to speak to General Arnold about Thunderclap and stated, "I have been subjected to some pressure on the part of the [British] Air Ministry to join hands with them in morale bombing. I personally believe that any deviation from our present policy, even for an exceptional case, will be unfortunate. There is no doubt in my mind that the RAF want very much to have the US Air Forces tarred with the morale bombing aftermath which we feel will be terrific."[23] In spite of these arguments, on 9 September 1944, Eisenhower changed his mind and directed Spaatz to have Lt Gen James M. Doolittle, Eighth Air Force commander, begin preparing for "area attacks" on Berlin.[24]

Interest in Thunderclap subsided in the fall of 1944 as the ground war made significant gains into German held territory. By the beginning of 1945, however, the situation had changed dramatically. The German offensive into the Ardennes surprised and shocked the Allies. Germany did not appear ready for surrender and seemed ready to fight through 1945, and perhaps longer. Hitler still controlled large sections of Europe, his army seemed strong, and the Nazi Party remained firmly in control. At the same time, German jets were appearing in growing numbers, raising questions about the continued Allied air supremacy, and there was fear of new "secret weapons."[25] Finally, the policy of unconditional surrender complicated the military's task. Not only did the Allies have to defeat a tough enemy but also they had to destroy the enemy's government. General Arnold began to doubt that the goals could be easily achieved, and he expressed his reservations in a letter to Spaatz in January 1945. "We have a superiority of at least 5 to 1 now against Germany and yet, in spite of all our hopes, anticipations, dreams, and plans, we have as yet not been able to capitalize to the extent which we should. We may not be able to force capitulation of the Germans by air attacks, but on the other hand, with this tremendous striking power, it would seem to me that we should get much better and more decisive results than we are getting now."[26]

Spaatz was under tremendous pressure to end the war with the surprisingly resilient Germans as soon as possible. A massive strike on the German capital seemed to be a way to shorten the war, especially since the city's importance as a transportation center to the ever-nearing Eastern Front had increased. Berlin was the seat of the German govern-

ment—the home of Hitler's Chancellory. The Eighth Air Force had not bombed the city for several months. Accordingly, a major attack was planned, similar to Thunderclap, aimed at the marshalling yards and government buildings. The targets were located in urban areas. Although precision bombing tactics would be used, Eighth Air Force planners knew civilian casualties would be high.[27]

When 1,000 B-17s attacked the city on 3 February, they dropped 2,279 tons of bombs visually with radar backup. Postattack photoreconnaissance showed unusual accuracy. Railroad stations and marshalling yards in the center of the city received severe to moderate damage and government offices, including the Air Ministry, Reich Chancellory, Foreign Office, and Gestapo Headquarters received numerous hits. More than 25,000 civilians died.[28]

Yet America had not abandoned its doctrine of precision bombing. It struck the targets in downtown Berlin with the most precise and effective weapon in its arsenal. But the attack did indeed mark a shift in emphasis from previous bombing missions. The pressure to force the Germans to accept an unconditional surrender led to precision attacks on military targets located near civilians, where the results would be felt by the enemy population to a vastly greater degree than before. Still, the moral code guiding the American air offensive had not been abandoned. Like General Sherman almost a century before, they believed that their efforts to gain a more rapid peace were morally acceptable because they ultimately saved lives. General Cabell pointed out that "the sooner [victory] came the sooner would it stop the war with its greater slaughter of Allied soldiers and civilians, as well as enemy civilians and soldiers. There would be a net reduction in deaths."[29]

The Berlin bombing was not an indiscriminate use of airpower. It was a precision attack on military targets designed to achieve total victory through unconditional surrender as soon as possible. This logic would also be used in the war against Japan.

Notes

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3. Henry H. Arnold, *Global Mission* (London: Hutchison, 1951), 140.
4. Haywood S. Hansell Jr., *The Strategic Air War against Germany and Japan: A Memoir* (Washington, D.C.: Government Printing Office, 1986), 64.
5. David MacIsaac, *Strategic Bombing in World War Two: The Story of the United States Strategic Bombing Survey* (New York: Garland Publishing, 1976), 13.
6. Hansell, 69.
7. Ibid., 70.
8. Ira C. Eaker and Arthur G. B. Metcalf, "Conversations with Albert Speer," *Air Force*, April 1977, 57.
9. Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, vol. 1, *1907–1960* (Maxwell Air Force Base, Ala.: Air University Press, December 1989), 150.

10. Haywood S. Hansell Jr., *The Air Plan That Defeated Hitler* (Atlanta, Ga.: Higgins-McArthur/Longino & Porter, 1972), 168–70.
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17. Ibid., 14–15.
18. Quoted in MacIsaac, 80.
19. Ibid., 81.
20. Richard G. Davis, "Operation 'Thunderclap': The US Army Air Forces and the Bombing of Berlin," *Journal of Strategic Studies*, March 1991, 90–111.
21. Ibid.
22. Ibid.
23. Ibid., 97.
24. Craven and Cate, vol. 3, 639.
25. Ibid., 715.
26. Ibid., 716.
27. Ibid., 725.
28. Ibid., 726.
29. Quoted in MacIsaac, 81.

Chapter 5

World War II: The Pacific Theater

Japan's extensive territorial conquests kept their home islands safe from aerial attack in World War II until the late spring of 1944. On 15 June 1944, 47 B-29s flying from China struck the Yawata iron and steel works on the island of Kyushu. This first mission typified the initial bombing raids against the home islands. It adhered to Army Air Forces doctrine, attacking the industrial web in daylight from high altitude, using both radar and visual precision bombing techniques.[1] But unique problems soon affected the air campaign against Japan, and the problems required unique solutions. One constant that remained, however, was the influence of an American sense of morality that placed great value on saving lives by ending the war quickly. As in the air offensive against Germany, this moral concern led to the gradual acceptance of area bombing to destroy precision targets and made the conduct of the air campaign predictable.

Early raids on the home islands occurred from China, because it was the only territory in Allied control close enough to permit B-29 operations. The campaign was known as Operation Matterhorn or "The Early Sustained Bombing of Japan." Its overall objective was to neutralize the Japanese war effort by destroying selected war-sustaining industries. The campaign also had as intermediate objectives the destruction of the Japanese air force and the reduction of Japanese shipping and naval resources.[2] Matterhorn's objectives reflected the precision doctrine used against Germany; in fact, the objectives were identical. Yet they would prove very difficult to accomplish against Japan. According to the official history of the Army Air Forces in World War II, the "bombing was neither early nor sustained. It achieved no significant results of a tangible sort and the intangible effects were obtained at a dear price."[3]

Matterhorn was plagued with severe problems from the beginning. One of the worst was the logistics situation. The bombers were based at six airfields in India, but they had to fly more than 1,200 miles to forward bases in China to be in range of Japan. Supplying fuel and munitions to the Chinese bases could occur only by air, since the Japanese held all the ports, railroads, and highways leading to them. Cargo aircraft were limited, so the Matterhorn bombers supplied themselves. Maj Gen Curtis E. LeMay, commander, XX Bomber Command, remembered flying eight B-29 supply missions from India, over the Himalayas to China, for every bombing mission against Japan. The enormous supply effort limited the XX Bomber Command to only one mission a week against the Japanese.[4]

Poor logistics was not General LeMay's only problem. Many of his crews were inexperienced, with little or no training in formation tactics, and most had never flown a combat mission. Many of the B-29s they flew were also not combat ready. The aircraft was rushed into production before completing flight testing, so its problems were often discovered in the field

where repair work was difficult. LeMay's mechanics made more than 3,000 changes to the engine alone in the first few months of operations in India and China. "If times had been normal, the factory would have tested the B-29s before they went into production, but we were doing it in combat, and we were still modifying the plane twenty years later when we finally retired it in the early 1950s," he recalled.[5]

Weather was also a concern and was perhaps the greatest difficulty to overcome in attacking Japan. Obviously, no weather reports came from Japan, and very few came from the Russian stations in Asia. Forecasters had to predict the weather over an area 1,700 miles away with no information from the regions where the weather originated. LeMay finally resorted to sending B-29s over Japan to obtain weather information, but the information received was "meager."[6] These problems ultimately proved insurmountable, and after 10 months and only 49 missions the operation ended. The men and equipment of XX Bomber Command moved to bases in the Marianas Islands, where they joined the XXI Bomber Command and continued the air offensive.[7]

XXI Bomber Command, led by General Hansell, began flying from the Marianas in late 1944. It first bombed the Japanese homeland on 24 November. The strategic bombing campaign Hansell directed at Japan was based on a modification to AWPD-1 known as AWPD-42, developed in 1942. The new plan retained the basic structure of AWPD-1 and also included a list of target systems in Japan that conformed to the industrial web theory.[8] As one of the creators of AWPD-1, General Hansell was convinced that high-altitude, precision bombing of industrial targets would defeat both Germany and Japan. He was determined to validate precision bombing theory against the Japanese, but his operation faced similar problems to those that had hampered LeMay in China. Inexperienced aircrews, poor logistical support, aircraft malfunctions, and dismal weather led to disappointing results and doubts about the air offensive.

The first mission against the Japanese homeland from the Marianas Islands experienced difficulties that were "an ominous preview of things to come."[9] The mission was scheduled for 17 November, but on that morning and the next seven, the Marianas were subjected to unfavorable takeoff winds and drenching rains from a typhoon. During the delay a B-29 weather ship sent to investigate the storm failed to return. Adding to Hansell's frustration was an impatient General Arnold, who served as commander of the Twentieth Air Force as well as commanding general of the Army Air Forces.

Finally, on the 24th the weather cleared and 111 B-29s were on their way to bomb the Musashino aircraft plant on the outskirts of Tokyo. Some of the crews had arrived on the Marianas less than a week before and flew their first combat mission against Tokyo without benefit of additional training. Seventeen bombers turned back before reaching the target and six failed to drop their bombs because of mechanical failures. Clouds over the target forced 35 aircraft to bomb by radar rather than visually, and all aircraft were affected by a 120-knot tailwind, giving them a ground speed of 445 miles per hour. The speed taxed the limits of the optical bombsights and the skills of the bombardiers. The final results were poor: two B-29s destroyed, eight damaged by enemy action, and three by accidental hits

from fellow B-29s. Only 48 bombs fell into the factory area, damaging 1 percent of the buildings and 2.4 percent of the machinery.[10] The experience of this mission typified the difficulties that would continue to plague General Hansell as he persisted in his attempts to make high-altitude, daylight, precision bombing work. His attempts failed, and he was replaced by General LeMay on 20 January 1945.

For almost two months, LeMay continued Hansell's precision bombing approach despite the fact that the results remained poor. LeMay then decided to make major changes in the operation. He later wrote, "It was now clear that we couldn't possibly succeed by basing our strategy on our experience from Europe. That system wasn't working. It was a different war with different weather and a different airplane. It called for a different solution."[11] Compounding LeMay's problems was a threat delivered by Arnold's chief of staff, Gen Lauris Norstad. General Norstad told LeMay that General Arnold needed results, and Arnold expected LeMay to get them or he would be replaced. LeMay was also informed that if he failed to get results, the invasion of Japan would go on as scheduled in November 1945. Not only did Arnold want results, he wanted decisive results, and he wanted them quickly. Finally, Norstad reminded LeMay that the projected cost of a mass amphibious invasion was one-half million American lives.[12] Faced with a sputtering air campaign, a boss demanding quick results, and one-half million lives hanging in the balance, General LeMay decided to try a new approach.

Without consulting General Arnold, LeMay ordered an attack on Tokyo for the night of 9 March 1945. B-29s stripped of their defensive armaments would drop incendiaries from very low altitude. The mission was a gamble and radically different from the high-altitude, formation approach, but LeMay had rationale for the changes. Flying between 5,000 and 7,000 feet avoided the strong winds found above 30,000 feet over Japan, reduced the strain on B-29 engines, and increased the aircraft's range. Flying without machine guns or gunners allowed the B-29 to carry more bombs.[13] The incendiary bombs would take advantage of typical Japanese construction of wood and paper. Moreover, it promised to provide a successful method of attacking Japan's industrial web. Most Japanese industry consisted of small "shadow" factories employing 50 persons or less, spread among the urban areas near (in the shadow of) larger factories. Also spread throughout the Japanese cities were home or "cottage" industries that produced small machine parts. Finally, school children were sometimes used to assemble small pieces of equipment in their schools.[14] An Army Air Forces intelligence study completed on 15 October 1943 had concluded that "Japanese military and industrial objectives were frequently surrounded by crowded residential sections and were hence exposed to sweeping conflagrations—indeed, much of the manufacturing process was carried on in homes and small 'shadow' factories."[15] Adding to LeMay's gamble was an Air Force study that indicated at least 400 aircraft would be needed to drop enough incendiaries to get the concentration required for an effective fire. "We didn't, however, have 400 airplanes," LeMay remembered. "We didn't have any time, either. We had to go *now*."[16]

The new tactics proved devastatingly effective. The first fire-bombing mission caused parts of Tokyo to burn for over 12 hours. When the con-

flagration finally subsided, reconnaissance photos showed that an area of 15.8 square miles had been destroyed, including 18 percent of the industrial area and 63 percent of the commercial area. More than 80,000 Japanese died in the raid and more than one million were left without homes. Measuring approximately three by four miles, the rectangular area bordered the "most important industrial section of Tokyo and included a few individually designated strategic targets." The results allowed the XX Bomber Command intelligence staff to remove 22 industrial objectives from their target lists. No other air attack of the war, in either theater—including the atomic attacks—was so destructive to life and property.[17] LeMay had picked the target area because of its industrial significance and that consideration drove the incendiary attacks that followed. He had discovered an effective way to use his B-29s to destroy Japan's war-making capability. By the end of the war, B-29s had bombed 66 cities in similar fashion and caused 25 to 90 percent destruction of their urban areas.[18]

The success of LeMay's incendiary bombing attacks seemed to signal the failure of the morally influenced, prewar doctrine of precision bombing. The raids exacted an enormous toll in civilian casualties, but political and military leaders supported them because they promised to save American and ultimately Japanese lives. In 1945 the American military leadership was under tremendous pressure to win the war and win it quickly with the least number of Allied casualties. But the political leadership remained committed to the unconditional surrender of a fanatical enemy that had literally fought to the death in hundreds of battles across the Pacific.[19] American leaders believed that the Japanese would certainly defend their homeland against an invasion with equal ferocity. Forcing the Japanese to accept an unconditional surrender must have made the task facing the military seem nearly impossible. Any idea or weapons that promised to save American and Japanese lives by avoiding a bloody battle on the Japanese shores were welcomed—and viewed as humane.

General LeMay's idea for shortening the war was to fire bomb Japanese cities. The campaign he created remained focused on destroying Japan's ability to wage war by attacking industrial targets. Fire bombing simply replaced the original precision bombing approach. Many of the targets subjected to precision raids were restruck with incendiaries. The difference in the two campaigns was in the method of attack, and fire bombing was much more effective. Shortly after the 9 March mission, LeMay reflected on the results and the costs: "We know that we have shortened the war by many months. Each of those fourteen crews who went down on that mission have saved American lives, perhaps scores of thousands."[20] Not only was fire bombing more effective in terms of destroying the enemy's war-making capability but it also had the added benefit of severely damaging civilian morale. By weakening the enemy's will to fight, it contributed to the goal of ending the war as soon as possible. LeMay, Arnold, and many others understood full well what they were doing to Japanese cities and their inhabitants. But the possibility of preventing an invasion and saving American lives outweighed any possible costs to the people of Japan, although preventing an invasion would also save Japanese lives. LeMay recalled, "No matter how you slice it, you're going

to kill an awful lot of civilians. Thousands and thousands. But, if you don't destroy the Japanese industry we're going to have to invade Japan. And how many Americans will be killed in an invasion of Japan? Five hundred thousand seems to be the lowest estimate. Some say a million."[21]

General LeMay knew he was responsible for thousands of civilian deaths, and later admitted, "I suppose if [we] had lost the war, I would have been tried as a war criminal."[22] But LeMay did not view himself as guilty. He felt his bombing campaign was ethical, especially in a total war for unconditional surrender, because he saved lives. "Actually I think it's more immoral to use less force than necessary, than it is to use more. If you use less force, you kill off more of humanity in the long run, because you are merely protracting the struggle," he later stated.[23] However, LeMay also pointed out that civilians were never the objective of the bombing campaign. "We were going after military targets. No point in slaughtering civilians for the mere sake of slaughter. Of course there is a pretty thin veneer in Japan, but the veneer was there."[24] LeMay's intent closely matched that of Doolittle and Spaatz in Europe in 1945. Although employing different tactics and weapons, the fire bombing of Japanese cities had results and goals similar to the radar bombing of Berlin. Like Doolittle and Spaatz, LeMay was trying to force a surprisingly resilient enemy to accept an unconditional surrender as quickly as possible.

In an effort to avoid civilian deaths, LeMay's XXI Bomber Command conducted a leaflet-dropping program to warn Japanese citizens of impending raids. The text of the leaflets accurately described the objectives of the fire-bombing campaign. According to LeMay, the warning stated that "We are not particularly at war with the Japanese Citizen, per se, but your leadership has gotten you into this mess, and you are going to be in danger. We are going to destroy the industrial areas of your city. We advise you to seek safety and leave."[25] The leaflet reflected LeMay's view. His main goal was to end the war as quickly, and as cheaply, as possible. If, in killing 330,000 civilians, he also saved millions who might have died in an invasion, then he succeeded.

LeMay's sense of morality reappeared in the decision to use atomic weapons. On 18 June 1945, President Harry S. Truman called for a meeting of his chiefs of staff to discuss the invasion of Japan and possible alternatives. General Eaker attended the meeting, representing General Arnold. Eaker unsuccessfully argued the Army Air Forces' position that the air campaign would eventually cause an unconditional surrender from the Japanese government without resorting to a costly invasion. The group eventually agreed to an invasion and set the date for 1 November 1945.

When the atomic bomb was successfully tested on 16 July 1945, it offered the president and the chiefs a possible means to avoid a ground assault. The chiefs, with one exception, agreed to the use of atomic bombs, but felt the invasion preparations should continue. They were not ready to put their faith in airpower completely, yet they also felt any weapon that might avoid an invasion was worth pursuing. General Arnold was the lone exception; he continued to oppose the use of either the bomb or an invasion to end the war, remaining convinced that LeMay's airpower could finish the job.[26] The *United States Strategic Bombing Survey* later

agreed, stating: "It seems clear that, even without the atomic bombing attacks, air supremacy over Japan could have exerted sufficient pressure to bring about unconditional surrender and obviate the need for invasion."[27] Arnold changed his mind when it appeared the Air Force would not be given enough time to defeat Japan with its air campaign before an invasion began. In choosing between dropping the bomb or launching the invasion, he preferred the bomb.[28] The bombs fell on 6 and 9 August 1945, and on the 14th the Japanese accepted the terms of surrender, despite possessing the means to inflict considerable damage on an invasion force.[29] In August 1945 it had an army of two- and one-half million combat troops and an air force of nine thousand potential Kamikaze aircraft.[30] An invasion would have likely caused hundreds of thousands of Japanese and American casualties.

The war in the Pacific was over. American airpower inflicted approximately 330,000 civilian deaths in Japan, most as a result of strategic bombing.[31] Although those deaths were terrible, General LeMay deemed his fire assault morally justified because it prevented an invasion that would have doubled or tripled the death toll. He later told a short story to illustrate his point. "[There was a] stupid man who was not basically cruel—he was just well-meaning. The guy cut off the dog's tail an inch at a time so that it wouldn't hurt so much."[32] The point of the story was that an overwhelming and decisive use of airpower inflicted less pain on Japan than would have continued precision attacks accompanied by an invasion.

Yet LeMay's bombing campaign was predictable, as were his attempts to be humane. Although facing difficult conditions and under tremendous pressure to get results, the air campaign he directed against Japan reflected the basic tenets of prewar strategic bombing doctrine. He attacked the Japanese industrial web to destroy Japan's ability and will to wage war in a desire to end the fighting as quickly as possible. Finally, when confronted with the possibility of an extended conflict against a fanatical enemy, LeMay resorted to area tactics that had results resembling American radar bombing efforts adopted to overcome a similar problem against Germany. Although the two campaigns were different, both resorted to less precise methods, motivated by the moral desire to shorten the war and save lives.

Notes

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Chapter 6

Limited Warfare

The combat experience of World War II was a harsh test of America's strategic bombing doctrine. Four years of conflict transformed what was untested theory into battle-hardened practice. In the process, targeting began to shift from precision attacks to area bombing, but the characteristic sense of morality remained as a cornerstone of air doctrine that continued to influence the conduct of the air war until the fighting stopped. Although the campaigns against Germany and Japan were conducted in different areas of the world under unique circumstances, the American code of ethics had similar effects on the two campaigns. In both theaters, air commanders faced problems caused by poor weather, inaccurate bombing, and deadly defenses, yet they refused to abandon their humanitarian principles. Forced to resolve these problems, they initially directed high-altitude, precision-bombing campaigns directed at the enemy's industrial web. The attacks were designed to destroy the enemy's capability and will to fight while avoiding civilian casualties. Later, however, when it seemed that forcing unconditional surrender in both theaters would prolong the fighting, less precise-bombing methods were used. Yet even then, the desire to shorten the conflict and save lives spurred bombing in which precision became a secondary condition. The moral focus led to the conduct of parallel air campaigns against Germany and Japan, and the emphasis on morality remained part of America's strategic bombing doctrine after World War II. It influenced bombing during limited wars in Korea, Vietnam, and Iraq, and it also made the conduct of those air campaigns predictable.

Korea

When North Korea invaded South Korea on 25 June 1950, it surprised and outraged President Truman, causing him to enter a war less than five years after the Japanese surrender ended World War II. Characterized by limited political and military objectives and the restrained employment of American military power, the war in Korea differed significantly from the earlier conflict. The conduct of the Korean War was shaped by world opinion, enemy propaganda efforts, criticism from allies, and the overriding fear that it might escalate into a world war with China and the Soviet Union. The conflict's unique nature produced restrictions on United Nations fighting forces that profoundly affected the US Air Force. Airpower, and, in particular, strategic bombing, was restrained as targets, weapons, and tactics were restricted to ensure the fighting remained confined to the Korean Peninsula. Despite confronting restraints that both confused and frustrated airmen accustomed to World War II's unfettered environment, air leaders created a predictable campaign shaped by an American sense of morality.

The initial plans for the "strategic" air war adhered to USAF bombing principles by focusing on North Korean industry. Air Force commanders knew that North Korea's factories had contributed to the Japanese war effort in World War II and felt their destruction was essential to the success of Allied war plans. Planners identified five major industrial areas and several other strategic targets. The targets paralleled those identified in the AWPD-1 plan of World War II and included oil refineries, railroad yards, locomotive shops, aircraft maintenance and supply facilities, industrial complexes, and hydroelectric systems. Air leaders also recognized a similarity between North Korean and Japanese cities. Both contained dispersed cottage industries and were constructed of materials vulnerable to incendiary attack.[1] Nevertheless, air leaders resisted the temptation to fire bomb North Korea, opting instead for a more discriminate strategic campaign. A 1953 Far East Air Force (FEAF) Intelligence staff study stated, "Every effort will be made to attack military targets only, and to avoid needless civilian deaths."[2]

Thus, when the strategic bombing campaign finally began on 8 August 1950, it resembled an early World War II campaign, with B-29s conducting precision, high-altitude, daylight raids with high explosive bombs against North Korea's military and industrial targets. The campaign that followed produced impressive results, destroying all but one strategic target in a little more than a month. Using precision radar and visual bombing methods, FEAF's B-29s disrupted an extensive small arms and munitions manufacturing industry and created severe shortages in North Korea's supply of petroleum, oil, and lubricants. The attacks also destroyed the North's steel industry and idled more that 3,000 employees of two locomotive reconditioning shops.

The campaign enjoyed ideal bombing conditions; daylight raids from medium altitude, without opposition, resulted in accuracies that helped minimize civilian casualties. An extensive leaflet program also reduced casualties.[3] Finally, on 15 September, Lt Gen George E. Stratemeyer, FEAF commander, reported, "Practically all of the major military industrial targets strategically important to the enemy forces and to their war potential have now been neutralized."[4] A few days later, when the joint chiefs directed that airpower would be employed only against targets affecting the tactical situation in North Korea, FEAF suspended "strategic" bombing and turned to interdiction.[5]

Interdiction helped prevent a United Nations' defeat following China's intervention but was unsuccessful at preventing the conflict from becoming a stalemate. It was equally unsuccessful at forcing the Communists to negotiate seriously during 1951. When the intensity of ground fighting decreased as the opposing forces settled into positions behind static front lines, Communist supply requirements dropped and the interdiction campaign became ineffective.[6] In May 1952 a new bombing campaign began that, although officially termed a shift in emphasis from the previous interdiction campaign, struck targets which were strategic in nature.[7] During the next several months bombing shifted away from interdiction targets to targets designed to influence not only the North Koreans but also their Chinese allies.[8] Eventually FEAF

bombed North Korean hydroelectric plants, the oil refinery at Rashin near the Soviet border, and railroad facilities, command posts, and factories in the capital city of Pyongyang—all targets that had previously been off-limits.[9]

Finally, as the deadlock continued on the 38th parallel, Gen Otto P. Weyland, FEAF commander since June 1951, considered attacks against North Korea's irrigation dams. General Weyland believed that the attacks would significantly increase the pressure to end the war but was "skeptical of the feasibility and desirability of destroying the North Korean rice-irrigation system."[10] Unwilling to take the severe step of authorizing the destruction of the enemy's rice crop, he nonetheless granted permission to attack dams where the resultant floodwaters would destroy North Korean lines of communication. The attacks successfully breached several dams, and washed away bridges, railroads, and highways. The floodwaters also destroyed part of a North Korean rice crop earmarked for Chinese soldiers, graphically demonstrating the vulnerability of the food supply for the Communist army.[11] The increased pressure of the air campaign, caused by the threatened destruction of the rice crop, likely helped to end the conflict in July 1953.

Many American air leaders were convinced that the end of the Korean War and the campaign against the irrigation dams were directly related, reinforcing the belief among many airmen that independently applied airpower could be decisive. Col William W. Momyer, who would become Seventh Air Force commander in Vietnam, expressed a popular opinion when he stated, "The freedom to target and to use air power [in Korea] brought the war to an acceptable conclusion [in 1953]."[12] Although the final bombing campaign was the least constrained of the war, it was still affected by moral concerns and followed predictable patterns demonstrated in World War II and earlier in Korea. Whenever it has faced a resilient opponent and the possibility of an extended conflict, the Air Force has gradually lifted bombing restrictions to increase pressure on an enemy. Not only is bombing intensified but also the number of acceptable targets is increased to heighten the effect on civilian morale. In spite of this development in Korea, ethical concerns still continued to steer the bombing campaign away from direct attacks on civilians. This trend was evident in the increased use of jet fighter-bombers during the final campaign. Although their bomb load was much smaller than a B-29s, fighter-bombers were now capable of bombing with much greater accuracy than the larger aircraft. Their use in the final bombing campaign allowed air leaders to avoid direct attacks on civilians while increasing the damage inflicted on North Korea.

The attacks on the irrigation dams adhered to the pattern. Only those dams whose breaching would wash out rail lines located nearby were attacked; civilians were indirectly threatened with starving by the loss of water necessary to grow rice. Whatever the target, the irrigation dam raids were motivated by the fundamental desire to save lives by forcing the enemy to stop fighting. This overriding ethical goal, and the predictable nature of American bombing that resulted from it, would be seen again in the air campaign against North Vietnam.

Vietnam

By the time the armistice was signed in Korea the United States had already taken the initial steps that would eventually lead to its involvement in Vietnam. In the following decade that involvement grew to the point that in March 1965 the USAF and Navy began a sustained bombing campaign—Operation Rolling Thunder against North Vietnam. The initial campaign design reflected the combined experiences of the World War II and Korean air wars. Predictably, Air Force leadership called for overwhelming attacks on North Vietnamese military and industrial centers to destroy the enemy's capability and will to fight. The recommended attacks, however, were not to be wanton. As in previous air campaigns, a sense of morality caused the air leaders to avoid suggesting targets that might cause civilian casualties.

Almost a year before the start of Operation Rolling Thunder, the joint chiefs developed a campaign plan that closely resembled AWPD-1, the Army Air Forces' targeting plan of World War II. The Rolling Thunder plan listed 94 targets in North Vietnam, with airfields to be attacked first. Then aircraft would bomb the North's petroleum storage facilities, followed by its small industrial system, including chemical plants and the nation's only steel mill. Finally, the road and transportation network would be struck.[13] Air planners at the Pentagon estimated that only 16 days were needed to destroy all of the targets. Once that was accomplished, air leaders believed that North Vietnam's ability to wage modern war would be destroyed and it would have to stop its aggression. During late 1964 the Joint Chiefs of Staff pushed without success to obtain permission to implement the plan.[14] Instead, a much more deliberate and restrained bombing campaign occurred. To the surprise and dismay of air commanders, they once again found themselves involved in an Asian war with limited political and military objectives.

Rolling Thunder became the longest air campaign ever conducted by the United States. More than one million sorties were flown between 2 March 1965 and 31 March 1968, when President Lyndon B. Johnson limited the bombing to targets below the 20th parallel. On 1 November 1968 Johnson ordered a complete bombing halt except for missions in support of reconnaissance.[15] Throughout the campaign, target selections had occurred in Washington, D.C., by the president and his principal civilian advisors. Their concept of how to conduct strategic bombing differed sharply from that of the American air leaders, who constantly argued for less restrictions and an expanded target list. President Johnson's personal control of the bombing resulted in severe restrictions that frustrated and hampered his military leaders.

Yet despite their differences, the two groups agreed on the importance of restricting the campaign to limit civilian casualties. According to Maj Gen Robert N. Ginsburgh, the joint chiefs' representative to the National Security Council, President Johnson was worried that attacks on civilians might cause the Soviets or the Chinese to intervene in the war. General Ginsburgh stated that "the concern for the lives of the civilian populace is overriding in almost everything up there (in North Vietnam)."[16] A lack of results and a desire to induce peace negotiations ultimately compelled

President Johnson to halt Rolling Thunder. Although successful negotiations never occurred during the Johnson presidency, the halt continued until President Richard M. Nixon ordered the bombing of North Vietnam to start again in the spring of 1972, in response to the Easter offensive.

Nicknamed "Linebacker," the new bombing campaign was predictably designed. The air chiefs returned to their doctrinal roots in targeting military and industrial centers in North Vietnam. Targets included railroad and road networks; bridges; railroad marshalling yards, and repair facilities; petroleum, oil, and lubricants storage areas; and thermal power plants.[17] Air commanders did not recommend attacks on the civilian populace. They carefully limited Linebacker bombers with a directive that stated, "It is essential that strike forces exercise care in weapons selection to minimize civilian casualties. . . ." President Nixon added a restriction against bombing irrigation dams "because the results in terms of civilian casualties would be extraordinary."[18] The targets were similar to those attacked in Rolling Thunder, but the bombing was more effective because of several factors: Linebacker enjoyed significantly fewer political restrictions, new, highly accurate bombing methods including "smart" bombs proved devastating against key targets, and the nature of the war had changed from an unconventional struggle to a large-scale conventional conflict.

The development of smart bombs greatly enhanced air commanders' efforts to design an intense air campaign that still conformed to their sense of morality. These bombs possessed laser or electro-optical guidance systems that could direct them onto military targets in heavily populated areas without increasing the possibility of civilian casualties. This capability seemed to resolve the moral dilemma of how to destroy an enemy's will and war-making ability effectively without exceeding ethical standards. Capable of being consistently placed within one or two feet of an aiming point, smart bombs allowed the Linebacker campaign to attack a large number of targets that would have previously been deemed off limits. One such target was an underground bunker located in a densely populated residential neighborhood near Bac Mai airfield. It contained the command and control center where North Vietnamese air operations were coordinated with surface-to-air missiles and antiaircraft gun defenses. A single fighter-bomber struck the complex with a laser-guided bomb that exploded deep underground, destroying the bunker without damaging the surrounding neighborhood.[19] Gen John W. Vogt, Seventh Air Force commander, remarked that his pilots were always conscious of the goal of avoiding civilians losses.[20]

A truce signed in January 1973 ended American participation in the war, but not until a final blitz from 18 to 29 December 1972, involving 729 B-52s and 1,216 fighter sorties, helped convince the North Vietnamese to agree to a settlement. That campaign was remarkably humane, influencing the North Vietnamese without directly attacking its civilian populace. More than 20,000 tons of bombs were dropped, causing considerable damage to military structures but only 1,318 civilian deaths in Hanoi and 305 in Haiphong.[21]

The success of this final Linebacker campaign, known as Linebacker II, reinforced the lessons Air Force leaders drew from strategic bombing in

World War II and Korea. Like earlier bombing campaigns, Linebacker II seemed to compel the enemy to stop fighting on American terms and thus reinforced the conviction that strategic bombing could be decisive. The apparent decisiveness conformed to a predictable pattern, demonstrated in earlier conflicts, of using strategic bombing to increase pressure on a resilient enemy that refused to yield. In earlier air campaigns the pressure was increased by lifting bombing restrictions and employing less discriminate methods. In the Linebacker campaigns, pressure was increased without compromising bombing accuracy due, in large part, to the use of precision-guided munitions (PGM). Their use changed the nature of American strategic bombing, making its conduct even more predictable than before. Those elements would be seen in the air campaign of Operation Desert Storm.

Iraq

The two decades that followed Linebacker II had little effect on the Air Force's post-Vietnam conviction that a properly directed and unrestricted strategic bombing campaign would be decisive in a future conflict. Consequently, when Air Force planners were directed, in August 1990, to develop a strategic air campaign to force Iraq's military to withdraw from Kuwait, they created a campaign that followed a predictable pattern that dated back to World War II. Nicknamed "Instant Thunder," their campaign focused on destroying critical military and industrial targets inside Iraq to make the price of staying in Kuwait unacceptable to Saddam Hussein. Unlike previous air campaigns in Korea and Vietnam—and perhaps because of them—air commanders conducting Instant Thunder received little political interference and very few restrictions. However, Instant Thunder had one restriction in common with earlier American strategic bombing: It was designed to avoid civilian casualties.[22]

Once more, the desire to avoid civilian losses influenced target selection, weapons, and methods of attack. Specific targets paralleled those listed in AWPD-1 and subsequent strategic air campaign plans. Instant Thunder directed aircraft against Iraqi military leadership facilities, the electrical power grid, oil production systems, communication nodes, water treatment facilities, petrochemical plants, agrochemical plants, fertilizer plants, and Iraqi industry. Almost 1,200 sorties a day attacked Iraq in an around-the-clock campaign to put intense, overwhelming pressure on Iraqi leadership.[23] Lt Gen Charles A. Horner, the joint forces air component commander, explained the purpose of his assault in a television interview after the war. "War is extreme violence and the way to halt the suffering is to get the war over as quickly and decisively as you possibly can. You have a moral obligation to get it over as quickly as possible and that is why we fought this war with such great intensity and unyielding pressure on the enemy until we had accomplished our goals."[24]

Air commanders went to extraordinary lengths to avoid attacking civilians. The extensive use of PGMs significantly reduced the number of civilian casualties. According to Lt Col Bernard Harvey, a key member of the Instant Thunder planning team: "It would have taken in the vicinity of 10,000 bombs in World War II to inflict the damage we did to the Al

Karakh International Telecommunications Center building in downtown Baghdad with one smart bomb—and, of course, we would have killed thousands of civilians and destroyed other facilities we didn't want to destroy."[25] Besides using precision munitions the Air Force also dropped standard "dumb" bombs, from fighter-bombers and B-52s. Although these aircraft bombed more accurately than those used in Vietnam, they were no match for PGMs. Consequently, aircraft delivering dumb bombs attacked targets where there was little chance of causing civilian casualties. An extensive leaflet campaign also reduced casualties by warning Iraqi civilians to remain at home and stay away from target areas. Colonel Harvey summed up the attitude of the Instant Thunder planners when he stated, "We avoided attacking the population at all costs."[26]

Operation Desert Storm defeated Iraq's military forces with surprising ease and quickness. Instant Thunder's role in the victory was significant, reinforcing long-held convictions about the decisiveness of strategic bombing and the viability of its morally influenced doctrine. The perceived success of bombing based on that doctrine, however, has caused American air campaigns to become more predictable, not only in terms of targets attacked but also in terms of the methods used to attack them. Every American strategic bombing campaign of the past five decades, including Instant Thunder, has been influenced by an American sense of morality that caused objectives and targets to remain remarkably constant while bombing methods have become increasingly more precise.

American strategic air campaigns have been consistently designed to destroy the enemy's war-making capability and have traditionally targeted oil refineries and storage facilities, lines of communication, armaments industries, electric facilities, and other industries. The campaigns have also sought to destroy the enemy's will to continue fighting but without directly attacking enemy civilians. The improved bombing accuracy has increased the ability of strategic air attack to destroy enemy capability and will while decreasing the prospect of civilian casualties. In the process, American strategic bombing has become eminently predictable. More than 50 years of perceived bombing success and an emphasis on precision solidified by advancing technology has likely guaranteed that future American air campaigns will conform to the established pattern.

Notes

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17. Ibid., 158.
18. Quoted in ibid., 164.
19. Tilford, 246–47.
20. Ibid., 159 and 164.
21. Ibid., 194–95.
22. James P. Coyne, "Plan of Attack," *Air Force Magazine*, April 1992, 41–42.
23. Norman Friedman, *Desert Victory: The War for Kuwait* (Annapolis, Md.: Naval Institute Press, 1991), 182–84.
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Chapter 7

The Future

According to former Air Force chief of staff, General Dugan, and General Schwarzkopf, commander in chief, US Central Command, the air attack directed against Iraq was one of the most overwhelming, decisive, yet humane strategic bombing campaigns in the history of airpower.[1] The campaign adhered to the basic tenets of American strategic bombing doctrine in targeting Iraq's capability and will to fight and in avoiding direct attacks on Iraqi civilians. The creation of that doctrine began in the 1930s at the Air Corps Tactical School, where air officers argued that strategic bombing should be aimed at an enemy's war-making potential instead of its deployed forces. They believed that a nation could be defeated by interrupting the delicate balance of its economic structure or industrial web. Such attacks offered airpower the ability to destroy not only an enemy's war-making capability but also his will to fight as well. The doctrine also reflected a uniquely American sense of morality, as it included the notion that capability and will could be destroyed without directly attacking civilians.[2] In practice such "ethical" bombing required more accuracy than technology was able to provide. Nevertheless, World War II air leaders attempted to implement the doctrine, and in so doing established a pattern that has characterized every strategic bombing campaign that followed. American air commanders have faithfully ascribed to the industrial web theory, attacking similar targets in each campaign with bombing methods that have become more and more accurate, causing a corresponding decrease in civilian casualties.

It is likely that the next strategic bombing campaign will continue to reflect the influences of the industrial web theory and its "moral approach" to bombing. Many air leaders contend that strategic bombing campaigns based on that theory played a significant role in successfully ending conflicts with Germany, Japan, North Korea, North Vietnam, and Iraq. As a result, future air campaigns will likely continue to focus on the industrial and military complexes of enemy nations to destroy their capability and will to wage war, with an aim to do so as rapidly as possible. Target selection will probably remain constant as bombers continue the decades-old pattern of attacking oil production and storage facilities, lines of communication, electric facilities, and armaments industries. And to ensure that civilian casualties remain minimal, the preferred ordnance for attacking targets in the industrial web is likely to remain PGMs.

While bombing doctrine has remained relatively constant since World War II, bombing accuracy has increased a thousandfold. General Dugan points out that it would take 4,500 B-17s dropping 9,000 bombs to have the same probability of destroying an important target as would a single stealth fighter dropping one PGM. And it can be done with far less risk to aircrews or civilians than the massive formations over Germany.[3] Dugan later added, "Desert Storm was a triumph of American air power . . . It

was a vindication of the old concept of precision bombing; the technology finally caught up with the doctrine."[4]

The ability to guide a single bomb into a specific section of a building has significantly reduced the prospect of civilian casualties, and in many ways has caused the American public to equate a moral air campaign with one that relies exclusively on PGMS. Editorials written during the conflict seem to indicate that Americans have indeed changed their perceptions of aerial warfare. A writer for *U.S. News & World Report* noted, "The new weapons on display against Iraq have given hope that technology needn't be the enemy of the innocent. Smart bombs, rightly used, can spare civilians."[5] A slightly different viewpoint is presented in an article referencing the television images of precision weapons attacking buildings in Baghdad: "At long last, a successor [has] emerged to the mushroom cloud as the emblem of America's military prowess, and good riddance."[6]

Given the public's increasing clamor against any civilian casualties, the next strategic campaign will likely continue the historic trend of employing the most precise weapons available to avoid civilian injuries while attacking military and industrial targets. That predictability has serious implications for the success of future strategic air campaigns, because it allows a perceptive enemy to design, test, and deploy countermeasures that at the very least would decrease bombing effectiveness—and at the worst may offer him an opportunity to win the war.

A perceptive enemy could take advantage of the enormous influence an American sense of morality has had on the development of strategic bombing doctrine. That influence is reflected in the predictable nature of target selection and the extraordinary measures Americans take to avoid civilian casualties. With that knowledge, an enemy might be able to stop a strategic bombing campaign by placing key military elements in locations where their destruction would result in enormous civilian casualties even if precision weapons are used (i.e., command posts and communication centers could be placed in hospitals or hotels). Large strategic complexes such as oil refineries or armament industries could be protected by moving civilians into housing located in or very near the target area. Although Saddam Hussein could not stop the USAF from flying over his country, he could protect some military equipment by placing it where he knew it would not be attacked.[7] A future enemy could protect his military in a similar manner, relying on American political and military leaders to stop a bombing campaign once they realize there is a possibility of harming large numbers of civilians. It is possible, under these conditions, for humane, morally acceptable bombing to demand more precision than technology can deliver.

Desert Storm may have demonstrated the practical limits of a morally guided strategic air campaign. Any additional ethical constraints on a future campaign could produce the antithesis of the desired effect. Instead of destroying the enemy's capability and will to resist, a campaign relying exclusively on precision-guided weapons could allow a perceptive enemy to mass his population in such a manner that all targets in his industrial web are protected by "innocent" civilians.

The first step in countering such a scenario is for American air leaders to recognize the problems inherent in an overly predictable campaign. The

key element of that predictability may well be the overwhelming emphasis on the industrial web. It may be possible to destroy an enemy's will and capability to fight by focusing an air campaign on targets far removed from the civilian populace, such as its fielded military forces. The sense of morality that created precision-guided weaponry is appropriate to the American psyche and will likely remain an integral part of it. American air leaders must recognize this fact and tailor future air campaigns to it.

Notes

1. The comments of Generals Dugan and Schwarzkopf are in chap. 1 of this study.
2. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 1, *Plans and Early Operations, January 1939 to August 1942* (1949; new imprint, Washington, D.C.: Office of Air Force History, 1983), 52.
3. Michael J. Dugan, "The Air War," *U.S. News & World Report*, 11 February 1991, 23–31.
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5. Harrison Rainie, "The Changing Moral Landscape of War," *U.S. News & World Report*, 18 February 1991, 9.
6. Jerry Adler, "Bombs over Baghdad," *Newsweek Commemorative Edition*, Spring/Summer 1991, 66–74.
7. See discussion in chap. 1 for General Schwarzkopf's description of this Iraqi tactic.

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