Fusing Airpower and Land Power in the Twenty-First Century

Insights from the Army after Next

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THE US ARMY'S "Army after Next" (AAN) project recently concluded the second of its annual tactical-/operational-level war games (TWG). The AAN TWG, a vital part of the Army's future-warfare laboratory, provides a tool for evaluating and refining AAN tactical and operational concepts.[1] The AAN's exploration of future warfare thus far suggests that a number of nascent technologies will present opportunities as well as challenges for the cooperation of air, land, sea, and space systems in the twenty-first century. For example, by 2020, precision-weapon systems will have so expanded in range that the tactical deadly zone may extend to two hundred kilometers. This zone may include not only precision and area-fire weapons located in urban centers and other complex terrain, but also space-based lasers, satellites, unmanned aerial vehicles, and a host of electronic weaponry. One can achieve a fairly formidable defense-in-depth, for instance, by positioning such systems in a manner that ensures interlocking fires throughout the depth of the defensive zone. What tomorrow's maneuver forces may encounter, therefore, is a World-War-I-style defense with interlocking fires but on a much larger horizontal and vertical scale. Indeed, the state of internetted information systems by 2025 will make activating such a defense much easier. One may also reasonably expect that even relatively poor nations will have the ability to erect some form of this internetted defensive zone. Furthermore, because in this highly lethal environment the fog and friction of war will not disappear—and may even increase—military personnel are likely to fight under conditions more psychologically

and physically demanding than in the past. What's more, real-time information may induce political leaders to delay or change their decisions in response to the continuous flow of data received from the combat zone. Hence, future political objectives may become just as fluid as future tactical situations. Successful military operations in such an environment will require an exquisite level of precise yet flexible synchronization among land, air, sea, and space systems.[2] This article argues that such synchronization—particularly as regards the fusing of airpower and land power—is a historical imperative revalidated by insights derived from the AAN's most recent TWG.

The Historical Imperative

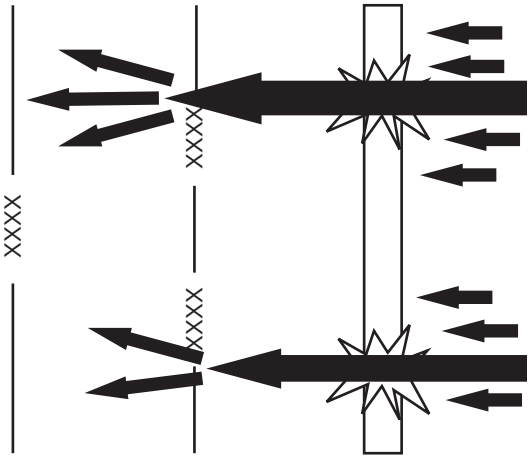
Efforts to use air systems for the benefit of land maneuver date back to the employment of lighter-than-air balloons for reconnaissance and observation purposes in the late eighteenth century. By the early 1880s, France and Germany had developed permanent balloon units for aerial reconnaissance. Despite a great deal of optimism about the ways that aviation would revolutionize modern warfare, the anticipated "conquest" of the air took longer than expected. Not until 1900 did Count Ferdinand von Zeppelin successfully fly a gas-powered airship across Lake Constance; three years after that, the Wright brothers succeeded in flying a heavier-than-air aircraft. European general staffs, contrary to popular myth, displayed keen interest in powered air vehicles almost from their inception.[3] Aircraft appeared to provide a means of bypassing the deadly zone—an urgent problem for the era's military theorists—to acquire intelligence about the enemy's defenses and possibly to strike at his capital—then considered the heart of his will to resist. However, parliaments and war ministries, concerned with minimizing development costs and prioritizing competing defense requirements, initially doled out funds only parsimoniously for the new systems.[4] Interest in military aviation nonetheless grew rapidly in the half decade before the Great War. German investment in fixed-wing aircraft, for example, increased over 720 percent (from 36,000 to 25,920,000 reichsmarks) between 1909 and 1914. By the outbreak of World War I, the anticipated missions associated with military aviation included strategic, operational, and tactical reconnaissance; artillery observation; air-to-air combat; combat against ground troops; destruction of enemy installations; liaison missions; and troop transport.[5]

Throughout World War I, air arms played an increasing role in land and naval combat. German reconnaissance aircraft were extremely significant during the Battle of Tannenberg, in which the Russian Second Army was encircled and destroyed. As Gen Paul von Hindenburg, the German commander, later testified, "Without the airplane, there is no Tannenberg." Likewise, intelligence delivered by the British and French air arms literally made possible the "Miracle of the Marne" that saved the British and French armies on the western front in 1914.[6] German use of massed, radio-equipped aircraft for close air support proved highly effective during the campaigns of 1917 and 1918, both in defensive and offensive roles. By the end of the war, modern air services had sunk a number of warships, submarines, merchant ships, and patrol boats; and navies had developed the capability to launch aircraft from sea vessels—the forerunners of aircraft carriers. In addition, intermediate- and long-range interdiction operations and strategic-bombing attacks were under way but proved less effective than hoped, due primarily to technological limitations and an armistice that arrived six months earlier than strategic planners had anticipated. Improved antiaircraft systems had made such attacks costly, even at night, and civilian populations had learned rather quickly to adjust to the idea of aerial bombardments.

During the interwar period, aviation, surface maneuver, and communication technologies matured considerably. Blitzkrieg theory, in fact, exploited this new confluence of technologies by integrating close air support, artillery fires, and ground maneuver

into a focused attack aimed at breaking through an opponent's defenses and disrupting his lines of communications and supply (fig. 1). The psychological shock of such an attack was supposed to cause the defender's resistance to collapse suddenly. By comparison, strategic-bombing theory, which emerged at about the same time, maintained that airpower had revolutionized warfare. The so-called true believers—Giulio Douhet in Italy, Hugh Trenchard in Britain, and Billy Mitchell in the United States—advocated bypassing the methodical carnage traditionally associated with land combat to bomb an opponent's population centers until he submitted (fig. 2). Thus, blitzkrieg and strategic bombing both sought to bring about an adversary's psychological collapse. Of course, the fundamental difference between the two lay in their "reach." On the one hand, blitzkrieg focused on delivering an operational knockout blow (through corps or army level) because that was about as far as motorized columns and support elements could penetrate in a single attack. On the other hand, modern air forces could range to strategic distances and return in the same day. In each case, lethality served merely as a means to achieve decisive effects within the all-important human dimension of warfare.

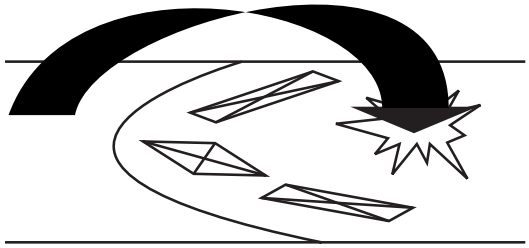
Blitzkrieg-style air-land cooperation helped generate a whirlwind of victories in both Europe and the Pacific during the early years of World War II. As the war continued, however, armies learned to cope both intellectually and emotionally with the focused lethality and heightened operational tempo that such cooperation produced. Victory then required the deliberate annihilation of the enemy's armed forces. Likewise, strategic bombing failed to live up to prewar expectations. The bombing of major cities and industrial centers proved to be a necessary but not a sufficient cause for victory. The Allies' powerful air arms achieved a high degree of lethality (e.g., Tokyo, Hamburg, and Dresden) but could not sustain the tempo necessary to create a decisive, war-winning effect.[7] Each bombing mission required enormous numbers of aircraft and ordnance, which in turn



- Concentrated Air, Artillery, and Ground Attacks at Decisive Points
- Rapid, Operational-Level Penetration
- Resultant Psychological Collapse/Physical Isolation of Opponent

Figure 1. Blitzkrieg Theory

worked to reduce the frequency with which one could execute the missions and all but prevented the carrying out of multiple raids simultaneously. Until US aircraft dropped atomic bombs on Hiroshima and Nagasaki—President Truman's "rain of ruin" from the air—long-range bombing technologies were not sufficient to break an opponent's will to



- Avoid Opponent's Land and Sea Forces
- Attack Heartland: Cities and Industrial Centers
- Break Opponent's Will through Moral Effect of Bombing

Figure 2. Strategic-Bombing Theory

fight.[8] Ironically, the very destructiveness and escalatory potential of these weapons of mass destruction precluded their use in subsequent wars.

In the years following World War II, operational-level air-ground cooperation both made and lost progress. On the one hand, it contributed to rapid victories in the Arab-Israeli wars (1948, 1956, 1967, and 1973), the Falklands (1982), Panama (1989), and the Persian Gulf (1990–91), demonstrating in the process that the principle of air-ground cooperation remains valid.[9] On the other hand, the sheer multiplication of a combat force's "moving parts" over recent decades has complicated the planning process beyond reasonable limits; the time required to think through and coordinate an air-ground operation has increased dramatically.[10] At the same time, civil wars, insurgencies, and terrorist activities, which have grown more frequent since 1945, reveal the limitations of both blitzkrieg-style warfare and strategic air attack, both of which seek to end wars quickly and decisively. Neither approach has been particularly successful at resolving protracted, internecine, or civil wars.

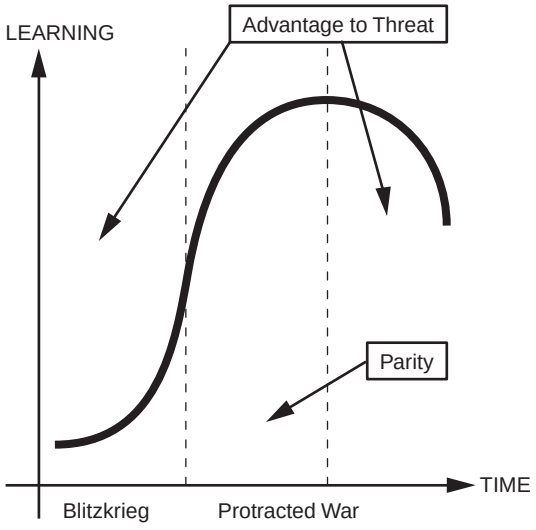
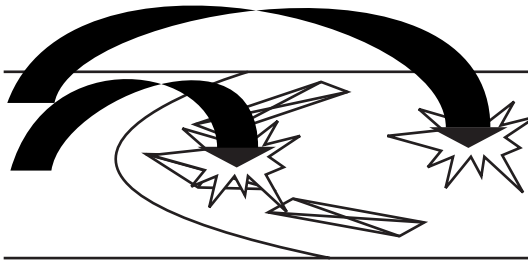


Figure 3. Emotional and Intellectual Learning Curves

Such conflicts generally involve not limited aims—such as collapsing an opponent's will to resist—but unlimited ones like political genocide. The centers of conflict themselves tend to remain highly dispersed and deceptively diffused. Under such conditions, time often benefits the less technologically sophisticated adversary by allowing him an opportunity to move along his intellectual and emotional learning curves. The learning curves of the more technologically sophisticated opponent, however, begin to level off and decay as his understanding gives way to confusion (fig. 3).[11]

Recent debates over whether airpower or land power is the truly decisive arm have missed the significance of the air-land imperative.[12] Every conflict since the classical age has been unique, requiring equally unique combinations of land, naval, and (later) airpower to meet political aims. Decisive victory has come not from the mere destruction of an opponent's material by air, land, and sea systems but from a combination of tempo and lethality sufficient to defeat an adversary's will to fight and to preempt his learning curves. Furthermore, arguments claiming that close-in fighting is a thing of the past ignore a modern adversary's capacity for employing an asymmetric strategy that nullifies the advantages of long-range, precision strike.[13] If twenty-first-century information technology is actually capable of producing a revolution in military affairs, that revolution must include the ability to wage war without resorting to linear, sequential campaigns.[14] If it does, airpower and land power must fuse in order to execute simultaneous, highly precise tactical-, operational-, and strategic-level air-ground attacks throughout the new global theater (fig. 4). Well-timed, precisely disposed attacks of this sort can take place over large areas without diluting decisive effects and, in fact, may offer the best means for achieving decisive results—even in situations like Vietnam, Bosnia, and Kosovo, in which violence can be highly dispersed and annoyingly diffused.



• Preempt Opponent's Learning Curves
• Focus on Will to Fight
• Optimize Tempo and Lethality

Figure 4. Simultaneous Operational and Strategic Attack

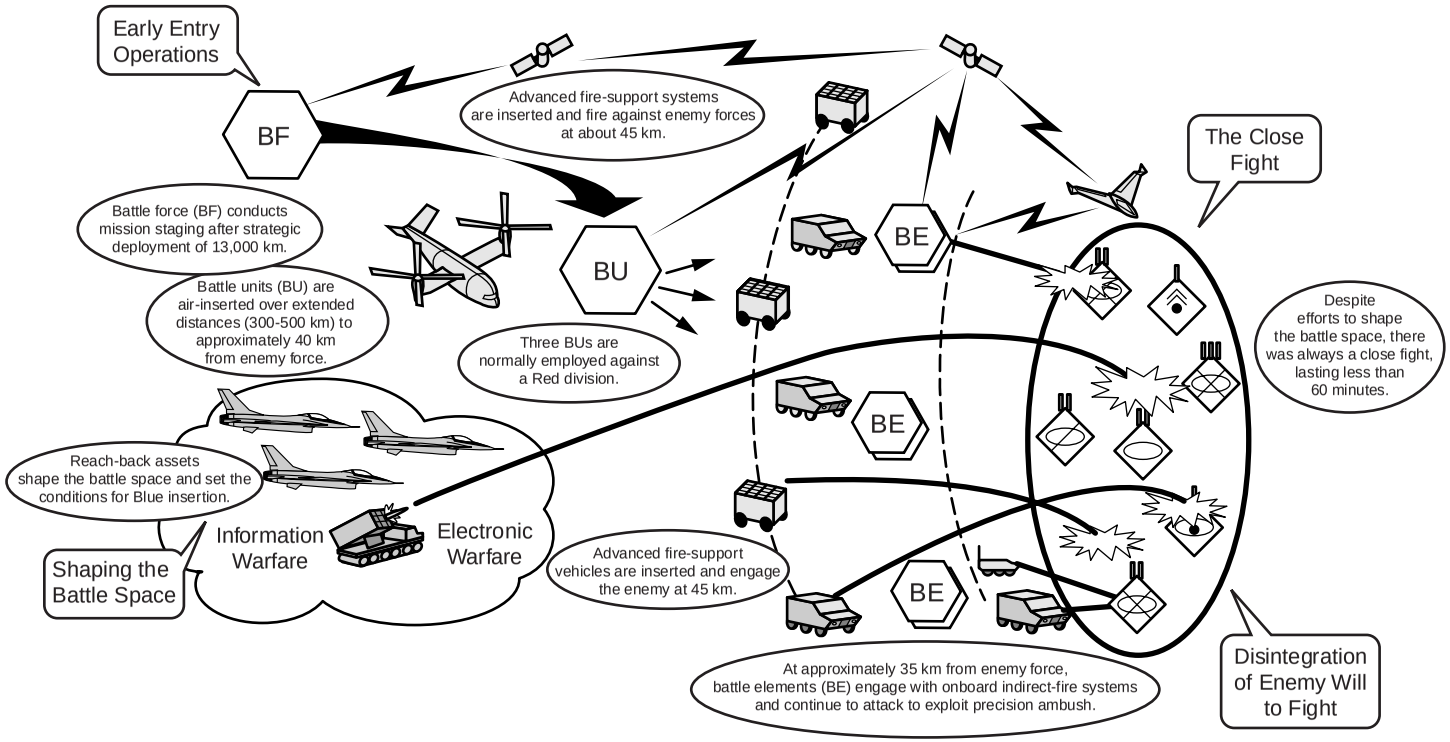
AAN Battle Forces and Operational Concepts

Because they are still under development, AAN battle forces and operational concepts are continuously changing. At the time of the TWG, AAN battle forces were roughly the size of a contemporary brigade (three thousand to five thousand soldiers) and consisted of 50–60 various kinds of unmanned aerial vehicles, 20–30 advanced attack airframes capable of moving the bulk of the battle force over strategic distances, 30–40 armored reconnaissance vehicles, and 30–40 armored fighting vehicles equipped with direct and indirect firing systems. For purposes of command and control, the battle force is divided into three battle units, which are in turn divided into six battle elements. By design, all battle forces are able to conduct combat operations for up to a week without resupply. Their speed, low profile, and organic firepower enable them to maneuver rapidly through gaps in an enemy's defensive zone to strike and, if necessary, to seize several of his major centers of resistance simultaneously, thereby encouraging the collapse of his will to resist. Their aim is to exploit knowledge and speed to create more challenges than the enemy can counter.

AAN operations typically begin with preparatory activities of forward-stationed and special-operations forces who gather regional intelligence and coordinate with the host nation to accommodate the arrival of the battle forces. Coordination with the host nation is particularly important for establishing reliable, long-term protection of logistical and support areas. At the same time, air, space, and information and electronic warfare systems begin shaping operations to set the conditions for victory. In the meantime, battle forces begin strategic deployment, either with organic assets or with the support of airlift and sea-lift assets or some combination of the three. Most of the mission planning is conducted en route. Once the battle forces are in-theater, planning is finalized and they dispatch their units, which are air-inserted over distances of three hundred to five hundred kilometers to arrive within 40 kilometers of the enemy force. Three battle units normally deploy against an enemy division. They execute a precision ambush against key targets, using indirect fires launched from remote rocket pods at a range of up to 45 kilometers. The battle elements then deploy and move in closer to the enemy, continuing the fight as necessary with organic direct and indirect fire systems until the enemy is completely destroyed or his resistance collapses. During the TWG, in almost all cases, the close fight proved necessary, despite the use of overwhelming firepower during shaping and ambush operations (fig. 5).

Insights from the TWG

Results from the TWG demonstrate the continued relevance of the imperative to fuse airpower and land power. The TWG drew upon the collective tactical and operational expertise of representatives from the US Army, US Air Force, US Marine Corps, and a number of other Department of Defense and civilian agencies—in total, over 150 personnel. It took place over two weeks, the first week consisting primarily of several train-up



Using Precision and Tempo to Create More Challenges Than the Enemy Can Counter

Figure 5. Typical Battle-Force Tactics (From Training and Doctrine Command [TRADOC], "Tactical Wargame Report," draft, 1998)

vignettes to acquaint the players with Red and Blue capabilities and the second week consisting of two vignettes involving full-service participation. The scenario called for the employment of a joint and combined force against an aggressor in Southwest Asia who had violated the territory of a neighbor state and was determined to defend his gains. Blue units included AAN-era light and heavy battle forces, a Marine task force, a carrier battle group, several Army XXI divisions, and a number of host-nation (circa 2010–15) divisions. Red forces consisted of several heavy divisions equipped with 2020-era technology that gave them a slight edge over host-nation and Army XXI units. A learning curve was clearly at work for each side, as evidenced by dramatically different outcomes of the two vignettes. In the first, Red fought Blue to a standstill because Blue forces were committed piecemeal. But in the second, Blue conducted a simultaneous attack throughout the depth of Red's defensive zone and achieved decisive results (fig. 6). Insights from the TWG fall into four broad categories.

Joint to Interdependent

The TWG's most important insight is that successful military operations in the twenty-first century will require the judicious orchestration of all assets within the combined joint task force. The greater speed and reach of the battle force only heightens the need for tactical-, operational-, and strategic-level synchronization. The battle force is not designed to function as a stand-alone weapon. It employs a number of nonorganic assets, particularly in the form of "reach-out" fires and air support, to achieve operational successes. As one of the vignettes showed, the battle force can perish quickly if committed prematurely or used improperly. Future conflict resolution and termination require not only the ability to assign the right force to the right mission at the right time, but also the fluid interoperability of every available war-fighting system.

Synchronizing for Decisive Victory

Even with the advantages of twenty-first-century information technology, achieving decisive victory will prove difficult against an adversary capable and determined to *preempt* our actions rather than merely react to them. During the first vignette, Red aggressively targeted and destroyed a number of battle-force airframes as they arrived at the fight piecemeal. In so doing, Red effectively preempted Blue's subsequent operations. In the second vignette, Blue used every dimension of his available combat power to strike a single paralytic blow designed to knock Red off balance and to preempt further aggressive actions on his part.

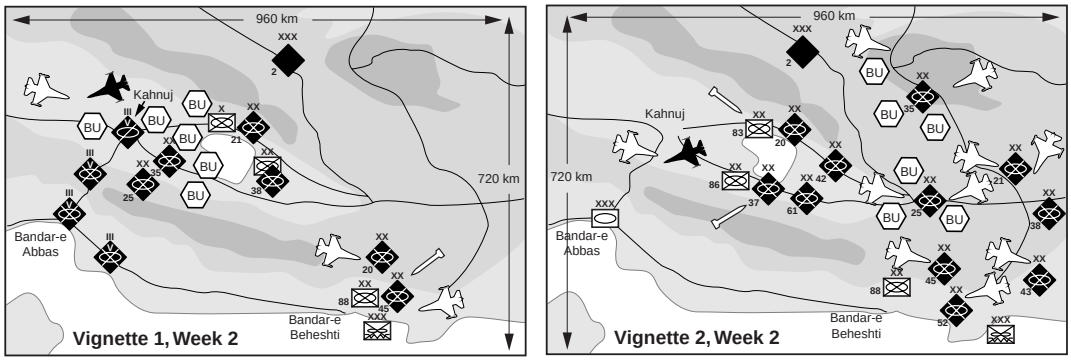
Complex Terrain and Nonlethal Weapons

Complex terrain will present significant challenges to the execution of rapid, decisive air-ground operations in the twenty-first century. As history shows, the difficulty of ejecting, destroying, or otherwise neutralizing an enemy in complex terrain increases exponentially with time. Even during the train-up week, Red forces always occupied complex terrain to offset Blue's long-range, precision-strike capabilities. As a consequence, civilian populations quickly became human "shields" that protected Red antiair assets, which in turn greatly restricted Blue's air-ground maneuver. Nonlethal weaponry may offer a way to rapidly overcome an adversary's resistance in urban and complex terrain with minimal collateral damage. Future AAN TWGs will examine this option as a means to augment lethal weapons and to maintain operational tempo over an extended, highly urbanized battlefield.

Logistics and Strategic Reach

The desired strategic reach of the battle force depends a great deal upon achieving a successful "revolution in military logistics." The TWG demonstrated that the difficulties associated with sustaining combat operations over a prolonged period of time and across a

- Blue (white images) defined the Red force (black images) as the *center of gravity* and attacked it with the *direct approach,* while Red defined the Blue battle force as the *center of gravity* and attacked it with the *indirect approach.*
- Blue set terms for tactical engagements by first attacking *functions* (command and control, air defense, and fire support) and then attacking *forces.*
- Blue attempted to *arrange operations* into a continuous flow from deployment to engagement to *termination*.



- Red was able to retain initiative and *balance.*
- Blue's *operational reach* was inhibited by the distance to the intermediate support base (ISB) and the lack of lift aircraft.
- Blue did not fully *anticipate* the timing of Red's actions and could not set and maintain the *tempo* of operations.
- Blue attacked Red forces *simultaneously* and *in-depth,* throwing off Red's *balance* by creating more demands than Red could counter.
- Blue dominated the enemy by *leveraging* combat power across all dimensions, which clearly resulted in a *balance* in the mix and application of force.
- Blue relocated its ISB to improve its *operational reach.*

Termination is achieved through *disintegration*—the effects of the combined application of attrition, maneuver, and cybershock.

Figure 6. The Essence of the Operational Art Endures (From TRADOC, "Tactical Wargame Report," draft, 1998)

broad and deep theater of war will likely remain significant. Perhaps not surprisingly, fuel remains a critical issue for the battle force, even with systems that are lighter, less bulky, and more fuel-efficient. As history shows, the greater the capabilities of a particular system, the more it is asked to do. Research centers across the globe are currently studying alternative fuel and propulsion systems in the hope of radically reducing the cumbersome logistical tail still required by land-power systems.[15] Even if such advances are successful, however, AAN battle forces, by design, will make use of strategic airlift and sea-lift capabilities of the Air Force and the Navy whenever possible.

The vision of AAN is a force capable of executing operational maneuver over strategic distances and of winning quickly and convincingly under a variety of conflict situations. Such a force not only will increase the range of crisis-response options available to the National Command Authorities, but also will bring us closer to realizing a historical imperative. Fully realizing that imperative, however, will depend upon how well the services work together to fuse airpower and land power. □

Notes

1. Also, an annual strategic war game provides insights relevant to the politico-military level of war. Robert B. Killebrew presents a comprehensive view of the AAN mandate and process in his "Learning from Wargames: A Status Report," in *Landpower in the 21st Century: Preparing for Conflict* (Carlisle Barracks, Pa.: US Army War College, 1998), 199–212.

2. Brig Gen Edward T. Buckley Jr. and Lt Col Antulio J. Echevarria II, "Strategic Preemption," *Military Review,* March–April 1998, 10–14. See also Training and Doctrine Command (TRADOC) Pamphlet 525-5, *Force XXI Operations,* 1 August 1994; *Knowledge and Speed: The Annual Report of the Army after Next* (Washington, D.C.: Chief of Staff of the Army, July 1997); and *Beyond Knowledge and Speed: The Army of 2025* (Washington, D.C.: Chief of Staff of the Army, November 1998).

3. See John H. Morrow Jr., *The Great War in the Air: Military Aviation from 1909 to 1921* (Washington, D.C.: Smithsonian Institution Press, 1993); Robert Wohl, *A Passion for Wings: Aviation and the Western Imagination, 1908–1918* (New Haven, Conn.: Yale University Press, 1994); and Lee B. Kennett, *The First Air War, 1914–1918* (New York: Free Press, 1991).

4. Ironically, while one aeronautical record after another was broken between 1905 and 1913, airships and fixed-wing aircraft had difficulty meeting design specifications laid down by military procurers in Europe and the United States. Morrow; and Kennett.

5. James S. Corum, *The Luftwaffe: Creating the Operational Air War, 1918–1940* (Lawrence, Kans.: University Press of Kansas, 1997), 17, 22.

6. Ibid., 23.

7. The Tokyo raids took place from 1942 to 1945. One particularly intense period of bombing during May 1945 produced 125,000 casualties. The bombing of Hamburg (1943) took place over four months and caused 90,000 casualties. The controversial bombing of Dresden (1945) occurred over three months and generated 80,000 casualties.

8. The bombing of Hiroshima and Nagasaki produced 220,000 casualties within three days and helped convince the Japanese emperor to surrender.

9. See Martin van Creveld, Steven L. Canby, and Kenneth S. Brower, *Air Power and Maneuver Warfare* (Maxwell AFB, Ala.: Air University Press, July 1994); and Col Thomas A. Cardwell III, *Airland Combat: An Organization for Joint Warfare* (Maxwell AFB, Ala.: Air University Press, 1992).

10. During the Gulf War, for example, air targeting required a 72-hour planning cycle, which made it extremely difficult to attack mobile targets. See Michael R. Gordon and Bernard E. Trainor, *The Generals' War: The Inside Story of the Conflict in the Gulf* (Boston: Little, Brown, and Company, 1995).

11. Such was the case with the analytical approach and strategic theories of Secretary of Defense Robert McNamara during the Vietnam conflict. As the war dragged on, US citizens lost faith in the military's ability to win it on favorable terms and at an acceptable cost.

12. Examples of these highly controversial arguments are too numerous to list. For a sample of those that focus on the future relevance (or prevalence) of strategic bombing, see Daniel T. Kuehl, "Thunder and Storm: Strategic Air Operations in the Gulf War," in *The Eagle in the Desert: Looking Back on U.S. Involvement in the Persian Gulf War* (Westport, Conn.: Praeger, 1996); Thomas A. Keaney and Eliot A. Cohen, *Revolution in Warfare? Air Power in the Persian Gulf* (Annapolis: Naval Institute Press, 1995); Lt Col John F. Jones, "Giulio Douhet Vindicated: Desert Storm 1991," *Naval War College Review* 45 (Autumn 1992): 97–101; Col Phillip S. Meilinger, "Giulio Douhet and Modern War," *Comparative Strategy* 12 (July–September 1993): 321–38; and Col Everest E. Riccioni, "Strategic Bombing: Always a Myth," US Naval Institute *Proceedings* 122 (November 1996): 49–53.

13. For an example of such an argument, see Richard P. Hallion, "Airpower and the Changing Nature of Warfare," *Joint Force Quarterly,* Autumn/Winter 1997–1998, 39–46.

14. Mark J. Conversino, "The Changed Nature of Strategic Air Attack," in *Landpower in the 21st Century,* 173–86, makes a persuasive argument for a new paradigm of strategic air attack and for retention of strategic strike capability.

15. On the need for a revolution in military logistics, see Yves J. Fontaine, "Strategic Logistics for Intervention Forces," in *Landpower in the 21st Century,* 129–46. Despite the advantages of computer automation and fast sea lift, the transportation and tracking of logistics within the US military need improvement. See David G. Harris and Richard D. Stewart, "US Surge Sealift Capabilities: A Question of Sufficiency," in *Landpower in the 21st Century,* 111–28; and Stephen B. Harris and David M. Keithly, "21st-Century Logistics: Joint Ties That Bind," in *Landpower in the 21st Century,* 147–59. Further solutions are offered by Jeanette K. Edmunds, "Organizing Logistics for Peace and War: The Necessity of a Trained Joint Logistics Support Command Headquarters," in *Essays on Strategy XIII,* ed. Mary A. Sommerville (Washington, D.C.: National Defense University Press, 1996), 221–54; and James W. Dowis, "American Global Logistics and Peace Operations," in *Essays on Strategy XIII,* 255–88.