

1999–2000 JFQ Essay Contest on Military Innovation

Military innovation is the razor's edge of strategic competition. In times of danger, states will turn to the innovators, seeking new ways to extend the reach of national power. The acme of inventive skill is laying the groundwork for strategic advantage before it

becomes a matter of national priority. For the United States, contemporary challenges to this task are well known—unclear threats, absence of a peer competitor, constrained budgets, an established infrastructure governed by time-honored traditions and operational practices, a full agenda of global issues and responsibilities competing for resources and attention—and the most significant obstacle of all, knowing how to innovate. At its root, the current debate over military innovation grapples with the fundamentals of building sound public policies—setting priorities, selecting the right leaders, crafting a vision, and establishing a framework for implementing change. To add to this debate, *Joint Force Quarterly* has sponsored essay contests on the revolution in military affairs and military innovation since 1994. This issue includes the work of the winners of the 1999–2000 JFQ Essay Contest on Military Innovation and three essays by other entrants selected by the editors.



In different ways, each essay addresses the requirements for turning innovation into the kind of transformation that cuts a new strategic edge. The articles address new concepts, radical technologies, rethinking institutional practices, the place of transformational leadership, and restructuring roles and missions. Together, they suggest that true military innovation requires a complex response that touches every aspect of an organization and all the capabilities of the United States to project power by land, sea, and air. These contributions offer new voices to the debate on how to best master the daunting task of providing the best force for the future.

JFQ

Contest Judges

- Brigadier General David A. Armstrong, USA (Ret.)**, is the director for joint history in the Office of the Chairman of the Joint Chiefs of Staff and member of the JFQ Advisory Committee.
- Alvin H. Bernstein** is a research professor at the National Defense University, the founding editor-in-chief of JFQ, and coeditor of *The Making of Strategy: Rulers, States, and War*.
- James R. Blaker** is an analyst at Science Applications International Corporation and former visiting fellow in the Institute for National Strategic Studies at the National Defense University.
- Colonel David M. Cole, USA**, is the Chairman of the Joint Chiefs of Staff Chair at the U.S. Army War College and member of the JFQ Editorial Board.
- Colonel Robert A. Doughty, USA**, is the head of the Department of History at the U.S. Military Academy and author of *World War II: Total Warfare Around the Globe*.
- Captain D. Scott Ensminger, USN**, is the Chairman of the Joint Chiefs of Staff Chair at the Industrial College of the Armed Forces and formerly taught at the Naval War College.
- Captain Chester E. Helms, USN**, is head of the Operational Concepts Division in the Joint Military Operations Department at the Naval War College and member of the JFQ Editorial Board.
- Mark Jacobson** is a professor in the School for Advanced Warfighting at the Marine Corps Command and Staff College and member of the JFQ Editorial Board.
- Martin C. Libicki** is an analyst at RAND and coauthor of *Mind the Gap: Promoting a Revolution in Military Affairs*.
- Thomas L. McNaugher** is the deputy director of the Arroyo Center at RAND and member of the JFQ Editorial Board.
- Lieutenant Colonel David E. Snodgrass, USAF**, is a speechwriter for the Chairman of the Joint Chiefs of Staff and frequent contributor to military periodicals.
- Colonel Jerre W. Wilson, USA**, is the Chairman of the Joint Chiefs of Staff Chair at the Marine Corps War College and formerly held a fellowship at the Brookings Institution.

JFQ

C-17 taking off during Large Package.



Interdependent Maneuver

for the 21st Century

By AUTULIO J. ECHEVARRIA II

Virtually all intelligence and operational estimates suggest that war in the 21st century will require interdependence among land, sea, and aerospace systems. The services report that precision weapons will so expand the range and capabilities of systems that the tactical deadly zone, once a few hundred meters, could extend beyond 200 kilometers by 2020. Operational exclusion zones, designed to deny access to land, sea, and aerospace forces, might reach 2,000 kilometers. Each is

likely to be flooded with an admixture of technologically sophisticated and relatively crude precision and area-fire weapons (including weapons of mass destruction) linked by communication systems from state-of-the-art to the relatively primitive. At the same time, a dynamic strategic environment will add missions and responsibilities. Thus service interdependence will be necessary at the low and high ends of the conflict spectrum.

Although *Joint Vision 2020* calls for the Armed Forces to become fully joint, it provides no operational concept for moving in that direction. The desired endstate, full spectrum dominance, requires becoming better than everyone else at doing everything. A worthwhile aim, it does not offer the common ground for developing a shared

Lieutenant Colonel Autulio J. Echevarria II, USA, is director of national security affairs at the Strategic Studies Institute at the U.S. Army War College and is the author of *After Clausewitz: German Military Thinkers Before the Great War*.

conceptual model of future operations. Even more disconcerting, two concepts that allegedly support full spectrum dominance—dominant maneuver and precision engagement—stem from competitive rather than complimentary traditions. Unless reconciled, no move toward interdependence will occur. This article examines the definitional and historical tensions underlying dominant maneuver and precision engagement and suggests a way of harmonizing them under a new operational concept, interdependent maneuver.

Conflicting Definitions

Documentation such as *JV 2020* and Joint Pub 3.0, *Doctrine for Joint Operations*, does not provide a unifying concept. As presented in *JV 2020*, its four concepts—dominant maneuver, precision engagement, focused logistics, and full dimensional protection, and their endstate, full spectrum dominance—are little more than tautologies. Dominant maneuver amounts to the capacity to conduct maneuver that dominates, precision engagement equates to the ability to engage with precision, and so forth. Presumably these tautologies are marks on the wall toward which each service (as well as the many partners involved in defense research and development) should focus. However, since they are self-referential, tautological

concepts tend to become ends in themselves. In other words, efforts to improve precision engagement tend to take place in isolation from similar endeavors in developing

the lack of a unifying concept is a result of the failure of *JV 2020* to reconcile dominant maneuver and precision engagement

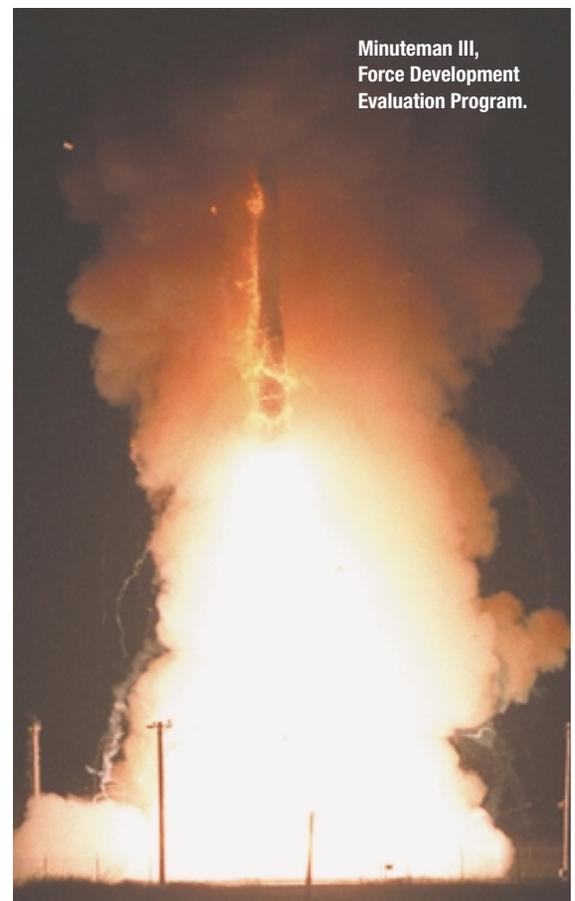
other concepts and could proceed beyond the point at which they contribute most meaningfully to full spectrum dominance. In a world of limited resources, efforts to perfect one capability could undermine the individual and collective effectiveness of others. Thus working toward ideal capabilities introduces pitfalls that might run counter to the development of a unifying operational concept. A vision document must at some point present desired capabilities that might come together to achieve battlefield success.

Moreover, the lack of a unifying operational concept is a result of the failure of *JV 2020* to reconcile tensions between dominant maneuver and precision engagement. For example, dominant maneuver means having positional advantage with decisive speed and overwhelming operational tempo. Widely dispersed joint land, sea, air, special operations, and space forces—capable of scaling and massing force or forces and the effects of fire—will secure advantage across the

range of military operations through the application of information, deception, engagement, mobility, and countermobility capabilities.

On the other hand, precision engagement is the ability to locate, surveil, discern, and track objectives or targets; select, organize, and use the correct systems; generate desired effects; assess results; and reengage with decisive speed and overwhelming operational tempo throughout the full range of military operations.

Each concept, according to *JV 2020*, uses “decisive speed and overwhelming operational tempo” and is to be applied across the “full range of military operations.” But to gain dominant maneuver one must also carry out all the activities—“scaling and massing force or forces and the effects of fires”—contained in the definition of precision engagement. In fact, on closer inspection, engagement seems to be integral to maneuver rather than a separate concept. Indeed, in most cases precision engagement will not occur without some movement of joint forces or assets, whether it be repositioning intelligence gathering satellites or launching F-16s. Similarly, dominant maneuver will likely require some form of engagement, whether surveillance and tracking hostile



Minuteman III, Force Development Evaluation Program.

U.S. Air Force (Amanda M. Edwards)

USS Tarawa operating off Aden.



U.S. Navy (David Miller)

aircraft or neutralizing cruise missile sites, to permit enough movement for positional advantage. Differently put, it is as if *JV 2020* defined the terms separately to mollify service interests rather than to isolate their virtues as concepts. Dominant maneuver and precision engagement are interdependent—parts of the same activity.

Dominant maneuver and precision engagement are defined independently because they have evolved from two conflicting traditions. The origins of dominant maneuver are rooted in theories identified with the military canon of the 20th century, so-called *Blitzkrieg* doctrine. In contrast, concepts underpinning precision engagement emerged from ideas which influenced strategic bombing theory as developed following World War I.

Loosely associated with the work of Basil Liddell Hart, J.F.C. Fuller, and Heinz Guderian, *Blitzkrieg* (lightning-war) centered on using air bombardments, artillery fires, and armored attacks to penetrate defensive zones, disrupt command and control, and sever lines of communication and supply. At best the psychological shock would cause a defender's resistance to collapse suddenly. At worst it would force an enemy to fight in encircled pockets, against overwhelming odds, and with rapidly diminishing supplies.

With emphasis on both physical and psychological dislocation, *Blitzkrieg* represented the epitome of 20th century maneuver theory.

A significant contribution to that theory came in the 1980s and 1990s as American military writers engaged in a debate over the merits of firepower versus maneuver. This exchange resulted in a redefinition of the concept of maneuver as the “use of fire and movement to gain a positional advantage.” Maneuver was thus divided into two mutually supporting elements—fire and movement, which could be employed sequentially or simultaneously. Fire is subsumed under maneuver. Yet for all its innovation, this new definition was applied better on the tactical than on the operational or strategic levels because coordinating fire and movement over great distances remained difficult, chiefly because of the limitations of communication technology.

The applicability of *Blitzkrieg* was not limited to land operations. Both land- and seapower evolved in similar ways and shared enduring principles. Alfred Thayer Mahan and Julian Corbett, prominent naval thinkers, relied upon landpower concepts such as central position, strategic lines of communications, and concentration of force to gain command of the sea. Early Japanese victories in the Pacific—the fall of Malaya and Singapore in two and a half months, Burma and the Philippines in three and a half

C-17 landing at North Field, South Carolina.



1st Combat Camera Squadron (Jeffrey Allen)

months, and the Dutch East Indies in two and a half months—validated the ideas espoused by Mahan and Corbett while confirming that *Blitzkrieg* would work in theaters in which naval (including amphibious) operations replaced armored pincer movements. The essential ingredient in rapid maneuver was not the armored vehicles but pinpoint application and timing of all-arms attack, followed by rapid exploitation before an enemy could recover. Accordingly, recent studies have concluded that the principles of maneuver warfare on land apply equally at sea.

Ideas associated with strategic bombing theory emerged concurrent with, but independent of, *Blitzkrieg* doctrine. They were inspired by events during World War I such as the bombing of London. Six months of air raids in 1915 caused 1,750 casualties and created a panic among the British population. Although the air arms of the day could not create or sustain the tempo to induce the enemy to surrender, Giulio Douhet in Italy, Hugh Trenchard in Britain, and Billy Mitchell in the United States believed that airpower, which was evolving rapidly, had revolutionized warfare. Accordingly, they argued that it was the best way to strike an enemy psychological center of gravity. By means of strategic bombing, air forces could circumvent the tactical and operational carnage of

surface attacks to strike directly and perhaps incessantly until an enemy capitulated or its capability to resist was destroyed.

With the appearance of larger aircraft and precision munitions at the end of the 20th century, a new generation of airpower theorists—notably John Warden—argued that the technology for achieving strategic collapse of an enemy was just over the horizon. Rather than using massively devastating bombardment, planners could employ long-range precision munitions for surgical strikes, greatly limiting collateral damage. As the range and variety of precision munitions grew, theorists began to embrace the possibility of executing parallel attacks—numerous simultaneous strikes against critical infrastructure nodes. These attacks would inflict damage on strategic assets that would render an enemy incapable of either reacting or recovering, thereby forcing strategic paralysis and psychological collapse.

The principles underlying dominant maneuver and precision engagement share a common theme—attacking an enemy psychological center of gravity. However, the fundamental difference is that the former finds movement as essential to effect an attack while the latter considers physical destruction as key. Both employ tempo, although for dominant maneuver tempo pertains to the pace of physical movement in relationship to that of an enemy. Precision engagement, on the other hand, uses tempo in terms of the rate at

M-1 on range in Korea,
Fool Eagle '00.



1st Combat Camera Squadron (Wayne Clark)

which destruction is inflicted on critical strategic assets. Both concepts also make use of lethality. But dominant maneuver uses lethality as a means to facilitate movement while precision engagement employs movement to inflict lethality.

Another difference is the level on which the concepts apply. Dominant maneuver is found to

practical applications of the conceptual forerunners of dominant maneuver and precision engagement have a mixed record

be the most applicable on the tactical and operational levels because of logistic and deployability limitations. Precision engagement is often considered in terms of strategic applicability because of the great distances that munitions and delivery systems can cover and because their expense makes them undesirable when used against tactical targets.

The intellectual tradition behind each concept has led to institutional conflict, not only with regard to budgets but to the roles of air assets in campaigns and whether they should be controlled by a single service. This conflict cannot be wholly solved with a unifying operational concept, but that is a place to start.

Blitzkrieg Revisited

Practical applications of the conceptual forerunners of dominant maneuver and precision engagement have a mixed record. *Blitzkrieg* doctrine was validated by German attacks on Poland, which fell in one month, Denmark and Norway, which succumbed in two months, and France and the Low Countries, which were overrun in one and a half months. But for various reasons, not the least of which was better training and equipment, Germany's enemies grew less susceptible to the psychological shock of *Blitzkrieg* as the war progressed. Campaigns between 1941–45, such as those conducted in Russia, North Africa, and Italy, became protracted as armies, navies, and air forces adjusted to a new style of war. Victory had to be won, more often than not, through costly and deliberate annihilation. On the Russo-German front, for example, where fighting was particularly bitter, encircled forces held out for extended periods, depriving *Blitzkrieg* of its chief advantage, lightning-like decisions. While the conflict remained one of movement on all fronts, logistical requirements and adaptive opponents limited the exploiting of tactical victories for operational effect.

From 1945 to 1995 the concept of *Blitzkrieg* changed more in form than substance. The object remained integrating ground, naval, and airpower into decisive strikes to break enemy will to fight



2^d Communications Squadron (Sarah E. Shaw)

B-52 being refueled, Desert Fox.

or destroy its military. The Arab-Israeli, Falklands, Panama, and Persian Gulf conflicts proved that the *Blitzkrieg* concept was valid even if defensive technology was becoming deadlier and enemies did not always collapse instantly. Still the problem of moving beyond operational to strategic exploitation remained. Except in a few cases, maneuver forces could not maintain an operational tempo that was sufficient to turn tactical success into strategic victory.

Legacy of Strategic Bombing

Unlike *Blitzkrieg*, history shows that the concept of strategic bombing outpaced technology. Although most evidence before World War II suggested that new air arms had enormous potential,

results fell short of expectations. Strikes against cities and industrial sites did not ensure victory. Rather than surrendering en masse, civilians became inured to massive devastation. Their will to resist was arguably strengthened rather than diminished. The bombing of Hamburg in 1943, for example, caused 90,000 casualties in a four-month period, the bombing of Dresden in 1945 killed 80,000 in three months, and the most devastating of the Tokyo raids led to 125,000 victims during May 1945. Even with tremendous destruction, long-range bombing technologies did not generate sufficient tempo or lethality to compel surrender.

For a time it appeared that Douhet and his disciples had mistakenly convinced themselves that air arms alone could achieve decisive effects. Then the United States dropped atomic bombs on Hiroshima and Nagasaki, causing some 220,000 casualties in three days. Technology seemed to finally catch up with theory. From the standpoint of more conventional munitions, however, the events of World War II had neither proved nor disproved the case for strategic bombing.

From 1945 to 1980 intercontinental ballistic missiles not only expanded traditional strategic distances to global proportions but gave Douhet a renewed relevance. For a while, the capability to deliver long-range weapons of mass destruction against cities and industrial centers, whether dropped from B-52s or launched from submarines or missile silos, appeared to render conventional forces obsolete. Strategic attack became synonymous with nuclear attack, and strategic theory was focused on concepts such as nuclear deterrence, flexible response, and mutual assured destruction. Fortunately, the practical application of strategic nuclear attack is untested. Meanwhile, the advent of precision-guided munitions meant launching a strategic strike without mass casualties associated with weapons of mass destruction. Long-range precision strikes were viewed as the new warfare, and campaigns in the Persian Gulf, Bosnia, and Kosovo have been touted as airpower victories. Although under the right conditions such weapons can indeed modify enemy behavior, the extreme of strategic psychological collapse prophesied by Douhet and Warden has proven elusive.

The Human Factor—People’s War

Conflicts in Vietnam, Cambodia, Afghanistan, and Somalia warned that insurgencies, civil wars, and terrorism remained the Achilles heel of dominant maneuver and precision engagement. Neither concept has been particularly successful in resolving protracted, internecine, or civil wars.

Marine vehicles in
UAE, Iron Magic.



13th Marine Expeditionary Unit, Combat Camera (Branden P. O'Brien)

Such conflicts generally do not involve limited aims such as breaking the enemy will to resist, but nonnegotiable objectives such as political annihilation or genocide. The centers of conflict tend to remain dispersed. Time benefits the side that wages a protracted war by offering an opportunity to learn and adapt. The side that seeks a short, decisive war, on the other hand, suffers a decline in morale as its expectations are frustrated and its emotional endurance wanes.

The basic element in waging protracted war, as Mao Tse Tung noted, is not overwhelming force, but patience. Indeed, a decisive battle in the traditional sense was to be avoided. Instead of a classic confrontation of force on the battlefield, Mao called for first creating and consolidating a political base of support among the populace, then expanding that base by bold attacks that forced an enemy on the defensive and then a full-scale counteroffensive. This theory proved successful in China and was adopted in other agrarian societies, especially in Vietnam and Cuba. Because such conflicts are decentralized, with the front nowhere and everywhere, they pose unique challenges to doctrines that attack the enemy psychological center of gravity by more conventional means. While U.S. forces consistently achieved tactical victories in Vietnam, political constraints kept them from achieving operational and strategic success.

Reconciling New Ways of War

To merge the concepts found in *JV 2020*, a unifying operational concept is required to combine the advantages of rapid movement with the benefits of precision strike. It also must unite the tactical and operational applicability of dominant maneuver with the strategic reach of precision engagement. It must make movement and fire interdependent—hence *interdependent maneuver*.

This means applying principles of fire and movement on all levels of war simultaneously, elevating a tactical concept to an operational and strategic one. This leap in conceptual warfare is made possible by expected advances of information, maneuver, and firepower technologies over the next 20 years (the focus of *JV 2020*). Interdependent maneuver assumes that such advances will blend the tactical, operational, and strategic levels of war into a single continuum of military activity. In any case, these levels have historically been little more than arbitrary categories used to enable planners to assign objectives, resources, and responsibilities. Therefore, rather than accept such distinctions, one may find it more useful to see warfare as consisting merely of military actions—whether hand-to-hand combat or strategic bombing—linked in time and space by

USS Pennsylvania.



U.S. Navy (Larry Smith)

myriad information systems. It may also be helpful to divide such actions into *fire*—the ability to inflict lethality whether by the tip of a bayonet or the virulence of a biological agent—and *movement*—the physical relocation necessary to deliver lethality.

Interdependent maneuver thus is built upon the definition of tactical maneuver developed by military theorists in the 1980s and 1990s. In terms of application, however, it brings the synergy of fire and movement to the realms of operations and strategy, levels on which these components have never been applied in tandem. For example, once a decision is made to use force in a crisis, interdependent maneuver means that integrated ground, naval, and aerospace assets would begin to move into theater while at the same time laying down suppressive fires throughout. Such fires would engage what have traditionally been considered enemy tactical forces as well as operational and strategic reserves and other critical strategic assets. The fires would combine ground, naval, and aerospace systems employing lethal and nonlethal weapons to facilitate the insertion of ground elements. These units would initially consist primarily of special operations forces equipped with reach-back support and

non-line-of-sight weapons. They would be deployed in and around key terrain to provide human intelligence, report battle damage assessment, augment other special operations forces already in theater, and interdict enemy movements with reach-back fires.

The suppressive effects of fires executed throughout theater would in turn enable additional aerospace, naval, and perhaps heavier ground forces to be deployed into combat. Such forces would exploit strategic vulnerabilities—extant or created by interdiction fires—in enemy defensive zones and maneuver to obtain a position of advantage. In the meantime suppressive attacks would continue throughout, developing synergy that comes from fire and movement. An enemy is thus presented with a constant rain of destruction across its entire defensive zone as well as the threat of inevitable capture or destruction by ground maneuver forces via the close fight.

One further benefit is that interdependent maneuver applies more to situations that resemble people's wars than to traditional maneuver conflicts. If such a war is in the first phase—building a political base—operations would likely entail less suppressive fires and a greater number of ground elements to isolate an enemy from indigenous peoples, destroy supply caches, and interdict efforts to reestablish a logistic flow. If people's war is in the second phase—expansion—interdependent

maneuver would be used to preempt its expansion. Suppressive fires and ground elements would operate in tandem to reduce known enemy concentrations, effect isolation, and erode indigenous support. The third phase—full scale counteroffensive—resembles a conventional conflict.

Interdependent maneuver is more than linking ground maneuver with the halt-phase concept, which claims that airpower alone can decisively defeat a large-scale armored attack. First, it

interdependent maneuver calls for a fully joint approach, generating synergy between fire and movement

calls for a fully joint approach from the outset, generating synergy with the interaction between fire and movement rather than placing the burden of success on one dimension, with others absent or

only in support. Second, halt phase applies to a limited segment of the threat spectrum; it can't effectively address people's war, for example. The type of conflict to which the halt-phase concept applies, armored engagements in relatively open terrain like the Middle East or Korean peninsula, is becoming rarer. By contrast, interdependent maneuver is based on the principle of presenting an enemy with a dual threat—destruction by fire or the close fight. Aerospace power alone is too easy to counter. The Armed Forces need a truly integrative operational concept to give them every possible advantage.

Technological Prerequisites

Ground forces will surely need to enhance strategic deployability to execute interdependent maneuver. The Army and Marine Corps have recognized this fact and established vehicle/system requirements to accommodate easier air and sealift with regard to military and commercial transport capabilities. Vehicles/systems projected for the 2020 timeframe will likely feature modular designs to permit mixing and matching components to a single chassis. One example of such a maneuver technology, a hybrid, air-cushioned vehicle, is currently under investigation and could hover over level terrain or water, enabling it to reach speeds well beyond conventional track or wheeled systems. At the same time, advances in active protection systems, lightweight ceramics, titanium, and other metals might afford ground vehicles nearly as much protection as heavy armor. Ground forces are also exploring vertical-take-off-and-landing and short-take-off-and-landing technologies to develop viable self-deployment options. Other initiatives include developing fuel-efficient and hybrid-power technologies to reduce logistic requirements,

making ground units more strategically agile. Most of these technologies are already under development in DOD or industrial laboratories. *JV 2020* should promote such technologies through a coherent, unifying operational concept that illustrates how such capabilities will contribute to military success.

The technological revolution of the 21st century which is currently underway might finally combine fire and movement in a genuinely effective manner. If so, well-timed, precisely-directed surface, subsurface, and supersurface attacks over extended areas will provide a better means for achieving political and military objectives even in situations like Vietnam, Bosnia, and Kosovo, where force requirements may be subtle and dispersed. To realize this potential, we must complete this revolution with comparable conceptual and doctrinal transformation. At a minimum, a means must be found to move the Armed Forces from a joint to interdependent approach. As *JV 2020* asserts, "Without intellectual change, there is no real change in doctrine, organizations, or leaders." Indeed, recent debates over which service is the arm of decision prove that there is still some way to go. Thus we must reconcile tensions between dominant maneuver and precision engagement. Merging these competing traditions into a single unifying operational imperative will not only reconcile them but permit a coherent articulation of how a particular list of desired capabilities would contribute to the execution of military actions and provide a blueprint to focus the efforts of the research and development community.

Adopting independent maneuver is not equivalent to emulating the technological optimism that captured airpower theorists before World War II. The evolution of technology will bring both opportunities and challenges to future ways of war. Indeed, whatever new technologies may bring, the key to applying military force will remain the ability to discriminate between the will of an enemy to fight and its means to do so.

JFQ