The Information Revolution and Post-Modern Warfare

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Armed Conflict in the 21st Century:

Continued ....Part 2

PRIVATISATION.

Interconnectedness, the dispersion of power and knowledge that flows from the information revolution, and the eroding legitimacy of armed force are leading toward privatisation in the realms of security and armed conflict. This has a long history, particularly functions involving technical skills beyond those of the average warrior. During the early modern period, for instance, artillery and siege engineering were often handled by contractors rather than regular soldiers. Today, as war fighting becomes ever more complex and the costs of training and retaining technical specialists escalate, the same process is occurring. Within the United States, many jobs done by uniformed personnel a few years ago are now handled by contractors. This includes not only administrative tasks but, increasingly, planning, analysis, war gaming, training, and education.

To take one example, the United States recently established the African Centre for Strategic Studies (ACSS) to help African states improve their civil military relations and their ability to understand national security planning and defence budgeting. This is similar to Department of Defence schools established for Europe, the Asia-Pacific region, and the Americas. But unlike these others, which are operated by the U.S. military, the corporation Military Professional Resources International, which is composed mostly of retired U.S. military officers, is responsible for the development and implementation of the curriculum for ACSS (with oversight from the Office of the Secretary of Defence).

Similarly, contractors play a vital role in most Department of Defence and service war games. As in the business world, “outsourcing” allows the U.S. military to acquire expertise while retaining organizational flexibility. Today the contracting out of military functions is most pervasive in the United States. In coming decades, other states will probably turn to it both as a means of acquiring cutting edge expertise and providing surge capacity during major operations. They might, for instance, hire medical support when they go to war rather than building an extraordinarily expensive military infrastructure.

Privatisation will give many state militaries and non-state actors the ability to acquire advanced skills much more effectively and quickly than if they had to develop them internally. Drug cartels and rogue states, for instance, might simply hire the best available information warfare experts. This could decrease the qualitative advantage held by the United States and other advanced militaries, at least in key areas where the expense of contracting is warranted. The same could happen in the realm of combat itself.

The world is witnessing the re-emergence of powerful and effective mercenary firms, particularly in places like Sub-Saharan Africa where state militaries are rife with problems and weaknesses. The best known was a company called Executive Outcomes, which was composed of combat veterans

from the ex-South African Defence Force. This company not only offered military advice and consulting, but also combat forces, which saw action in Angola and Sierra Leone. While Executive Outcomes officially closed shop at the end of 1998 (largely in response to South Africa's passage of the Military and Foreign Assistance Act), a successor or successors may emerge.

In fact, there were reports in early 1999 that South African mercenaries simply relocated to Eastern Europe and continued to supply the Angolan rebels (who could pay with the proceeds of diamond sales). This is simply the starkest example of a wider trend toward the privatisation of security.

As nations seek ways to attain a surge capacity without the expense of sustaining a large, peacetime military, and as they face difficulties recruiting from their own populations, contracting will be an attractive option for filling the ranks. Eventually, advanced nations like the United States may replicate the development of the Roman army. During the early days of the Roman Republic, the army was composed largely of citizen soldiers who served during times of threat. Eventually this gave way to an army of long-service professionals attracted by the financial benefits service could provide. By the late imperial period, it was increasingly difficult to recruit Romans because of other economic opportunities and because the prestige of military service declined. At that point, the army was composed mostly of foreigners attracted by the chance to gain citizenship and other material inducements.

There is the possibility that the future U.S. military may have to turn to foreign recruits in order to fill its ranks. This is simply one additional form of the privatisation of security. History suggests another twist that privatisation might take as well. Whenever rich, powerful companies believed that no state was willing to shed blood to defend their people and assets, the temptation was to form private armies and navies. The British East India Company, for instance, once had one of the largest military establishments on earth.

If coming decades see the development of truly transnational or non-national corporations, this process may be repeated. Corporate armies, navies, air forces, and intelligence services may be major actors in 21st century armed conflict. This will open new realms of strategy and policy. Would it, for instance, be legal and acceptable for the United States to declare war on a corporation that was guilty of armed aggression against a friend? To sign an alliance with one?

ASYMMETRY.

States which decide to commit aggression in coming decades will know that if the United States and the world community decide to counter the aggression, they can. The qualitative gap between the U.S. military and all others is wide and growing. This leaves aggressors two options: they can pursue indirect or camouflaged aggression, or they can attempt to deter or counter American intervention asymmetrically.

While the word "asymmetry" only recently entered the American strategic lexicon, the idea is not new. From Sun Tzu's contention that "all warfare is based on deception" through B.H. Liddell Hart's advocacy of the "indirect approach" to Edward Luttwak's "paradoxical logic of strategy," strategic thinkers have long trumpeted the wisdom of avoiding the enemy's strength and probing for his weakness.36 Asymmetry simply means making maximum use of one's advantages. It is the core logic of all competitive endeavours, whether sports, business, or war. Consistent winners master this logic.

Through what might be called "low" asymmetry, militaries facing a superior opponent avoid open, force-on-force battles and rely on hit-and-run tactics, deception, camouflage, dispersion, the use of

complex terrain like cities, mountains, and jungles, guerrilla warfare, or terrorism. They often drag out the conflict, playing on an asymmetry of will or patience, and make use of their own tolerance for pain and cost.

Throughout history, low asymmetry has allowed the weak to overcome the mighty, from the defeat of Darius by Scythian guerrillas through the American Revolution and Spain's expulsion of Napoleon to the 20th century wars of liberation in Algeria, Zimbabwe, Namibia, Vietnam, and other colonies. By contrast, "high" asymmetry is favoured by militaries facing an enemy which outnumbers them or in situations where casualties must be minimized. High asymmetry uses superior technology, information, training, leadership, and the ability to plan and coordinate complex operations to overcome quantitative disadvantages or limit the blood cost of warfare. Many colonial wars, from those of Caesar through the campaigns of the Spanish conquistadors to the European conquest of Africa in the 20th century evinced this type of asymmetry.

Battles like Marathon, Agincourt, Blood River, and Omdurman were won by asymmetry. In the modern context, blitzkrieg, whether used by its German architects or by the coalition forces expelling Iraq from Kuwait, is an example of high asymmetry.

Asymmetry is a characteristic of periods of rapid change, particularly revolutionary ones. In geological history, there have been times when many new species emerged. Most proved unable to survive, leading to new periods with less diversity. Military history follows the same pattern: periods of great diversity follow periods of relative homogeneity. The current era is one of diversity. In coming decades, some methods of warfare or of military organizations will prove dysfunctional, thus leading to greater homogeneity. But for the period of diversity, asymmetry will be a dominant characteristic of armed conflict.

COMBATANTS.

Throughout the 20th century both states and non-state actors have undertaken armed conflict. While some non-state actors, particularly insurgent movements, have shaped history, state combatants have been the most significant. Great wars tend to work against diversity in methods and organizations for armed conflict, serving to weed out the dysfunctional from the successful. The great wars of the 20th century did precisely that for state combatants. While there certainly was great variation among states in terms of the size, effectiveness, and technological advancement of their militaries, there were significant similarities in terms of military organizations and methods. These included: (1) hierarchical organization into services defined by the primary operating environment, and into discrete groups of officers and enlisted personnel; (2) formal, hierarchical procedures for planning and decision making; (3) a professional core of some type reinforced, in many cases, by a reserve; (4) emphasis on linear operations (supported, in some cases, by non-linear special operations) organized into battles, campaigns, and wars; and, (5) reliance on the equipment produced by advanced industry and science, and on formal supply systems.

Non-state combatants varied from this. Their organization tended to be less formal, with some combination of guerrilla combatants, political cadres, terrorist cells, and militias. Their operational techniques stressed hit and run tactics, harassment, psychological actions, and guerrilla activities, often using complex terrain. Their supply systems tended to be a blend of the formal and informal, often relying on captured arms, ammunition, and equipment, in large part because they did not have the geographic, financial, or organizational resources to do otherwise. Often the ultimate objective of non-state combatants was to take on the characteristics of state ones.

In the opening half of the 21st century, the types of state and non-state combatants, which have

characterized recent armed conflict, will continue to exist, but they are likely to be joined by new forms. The U.S. military probably will be the first postmodern state combatant, attaining greatly amplified speed and precision by the integration of information technology and development of a system of systems which links together methods for target acquisition, strikes, manoeuvre, planning, communication, and supply.

Its organization will be less rigidly hierarchical than that of modern state combatants. This will both reflect the fact that a digitised force needs less rigidly centralized control, and that the sort of high tempo, pulsed, holistic, non-linear operations it will undertake simply will not work with rigid, centralized control. The final type of combatants in 21st century armed conflict are likely to be postmodern non-state ones. This will consist of loose networks of a range of non-state organisations, some political or ideological in orientation, others seeking profit. They will work toward an overarching common purpose, but will not be centrally controlled or have a single centre of gravity.

When one type of combatant fights a similar type, the result will be a more or less symmetric. Even though one side may prove more capable or competent than the other, their basic tactics, strategies, and weapon systems will be similar. But much of 21st century armed conflict will be distinctly asymmetric, pitting one of the four types against a different one. In all asymmetric conflicts, the combatant at a material disadvantage will succeed only when it can make use of greater will and creativity. When there is no asymmetry of will and creativity, postmodern state combatants will generally have an advantage. When there is an asymmetry of will and creativity, anything is possible.

PART II:
IMAGES OF FUTURE WAR

The Service and DOD View.

The specific shape of future armed conflict will be determined by policy decisions, technological developments, economic, political, and social trends, and by the geostrategic configuration that emerges. This dizzying complexity makes it impossible to predict the path of future warfare with certainty. At best, images can be sketched. Broadly speaking, the opening decades of the 21st century are likely to see some combination of three modes of warfare: formal war, informal war, and grey area war. Formal war pits state militaries against other state militaries. Since the 17th century, it has been the most strategically significant form of armed conflict and will probably remain so for at least a few more decades, perhaps longer. For this reason, it has been the focus of most futures-oriented thinking within the U.S. military and Department of Defence.

American policymakers and military leaders are attempting to define and create the first postmodern state military, primarily for use against “rogue states” or a “near peer competitor” that might appear early in the 21st century. The official vision of future war reflects the belief that “information superiority” will be the lifeblood of a postmodern military and thus the key to battlefield success. According to Secretary of Defence William Cohen, “The ongoing transformation of our military capabilities—the so-called Revolution in Military Affairs (RMA)—centres on developing the improved information and command and control capabilities needed to significantly enhance joint operations.”

Deriving from a “system of systems” that connects space-based, ground-based, and air-based sensors and decision-assistance technology, information superiority—should it be realized—would allow American commanders to use precision weapons—many fired from safe locations far from the battlefield—to strike the enemy’s decisive points at exactly the right time. The idea is that American

forces will be nearly omniscient while enemy forces are confused and blind. The most important expression of the official American vision of future war is a document known as Joint Vision 2010. Known within the Department of Defence as "JV 2010," this is the "conceptual template" for the future U.S. military able to attain "full spectrum dominance"—qualitative superiority over any anticipated enemy in any anticipated operating environment. JV 2010 holds that the key to success in an increasingly lethal battlespace will be "dominant battlespace awareness" growing from the system of systems. This will allow the postmodern U.S. military to survive on a battlefield replete with weapons of mass destruction and precision guided munitions. JV 2010 states:

"To cope with more lethal systems and improved targeting, our forces will require stealth and other means of passive protection, along with mobility superior to the enemy's ability to retarget or react or our forces. Increased stealth will reduce an enemy's ability to target our forces. Increased dispersion and mobility are possible offensively because each platform or individual warfighter carries higher lethality and has greater reach. Defensively, dispersion and higher tempo complicate enemy targeting and reduce the effectiveness of area attack and area denial weaponry such as weapons of mass destruction (WMD). The capability to control the tempo of operations and, if necessary, sustain a tempo faster than the enemy's will also help enable our forces to seize and maintain the initiative during military operations."

As the U.S. military evolves along the lines described in JV 2010, it will gradually abandon old operational concepts like massed force and sequential operations in favour of massed effects and simultaneous operations. These will be possible because information technology will allow commanders to identify targets and coordinate complex actions much better than in the past. In addition, technological advances, according to JV 2010, "will continue the trend toward improved precision. Global positioning systems, high-energy research, electromagnetic technology, and enhanced stand-off capabilities will provide increased accuracy and a wider range of delivery options."

To make maximum use of emerging technology, JV 2010 outlines four new operational concepts to guide the development of U.S. armed forces and military strategy: dominant manoeuvre which is defined as "the multidimensional application of information, engagement, and mobility capabilities to position and employ widely dispersed joint air, land, sea, and space forces to accomplish the assigned operational tasks"; precision engagement which will allow accurate aerial delivery of weapons, discriminate weapon strikes, and precise, all-weather stand-off capability from extended range; full-dimensional protection of American forces based on active measures such as battlespace control operations to guarantee air, sea, space, and information superiority, and integrated, in-depth theatre air and missile defence, and passive measures such as operational dispersion, stealth, and improved sensors to allow greater warning against attack, including chemical or biological attack; and focused logistics which is "the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while enroute, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical levels of operations."

Joint Vision 2010 was intended to synchronize the futures-oriented programs, which the services had begun to develop. Where JV 2010's time frame was mid-term, the Joint Experimentation Program created in 1998 at the United States Atlantic Command (USACOM, since renamed U.S. Joint Forces Command or JFCOM) sought to expand the U.S. military's thinking about future warfare by weaving together the services' futures programs. This is a very ambitious undertaking. Futures-oriented thinking deals with force development, which is a responsibility of the services. In fact, most of the futures thinking within the U.S. military is still done by the services.

The Army, the Air Force, and the sea services have each developed a range of futures programs based on their expectation about the future security environment and the future of war. So far, the Army's program is the most elaborate. Since there is no White House, National Security Council, or congressional concept of the future security environment or long-term American national security strategy, the Army, like the other services, has had to craft its notion of the future role of landpower on its own. It has formulated a vision that is highly innovative in its approach to technology, organization, and leadership, but conservative in its assumptions about the nature of warfare and the purposes of American military power. This blend of innovation and conservatism runs throughout the documents and programs that explain the Army's view of the future.

Army Vision 2010, which explains how the Army will support the ideas introduced in Joint Vision 2010, argues that landpower will remain the most salient form of military power in the future security environment because many American military operations will fall on the lower and middle portions of the continuum of military operations, because most foreign militaries will remain landpower oriented, and landpower makes permanent "the otherwise transitory advantages achieved by air and naval forces."

Army Vision 2010 also argues that the Army is best suited among the services to deal with asymmetric challenges such as urban combat, terrorism, information warfare, and insurgency. While it notes that operations other than full-scale war will be the most common task of the 21st century Army, it identifies the possibility of conventional war against "once dominant states [which] perceive an unfavourable shift in power relative to their neighbours." Oil and "radical fundamentalism," according to Army Vision 2010, might motivate war in the "Euro-Middle East region," while a shortage of food and arable land might do likewise in "the Asian arc." Should either of these happen, the U.S. Army might be called on to defend or liberate territory, contain the conflict, or perform other missions.

To transform the concepts outlined in documents like Army Vision 2010 into reality, the Army developed a series of battlelab simulations and exercises called Louisiana Manoeuvres. Begun in 1992, this quickly grew into the elaborate "Force XXI" process that uses battle laboratories, warfighting experiments, and advanced technology demonstrations to generate and test ideas. In the mid-1990s, Army Chief of Staff General Dennis Reimer decided that his service needed to look even deeper into the future. The pace of change in the modern world had become so intense, General Reimer concluded, that complex organizations like the Army must extend their strategic planning horizons. And the main weapon platforms of the Army, including the Abrams main battle tank, the Bradley fighting vehicle, and the Apache attack helicopter were expected to approach obsolescence around 2015. General Reimer thought it necessary to craft a rigorous method to decide whether the Army should seek a new generation of tanks, fighting vehicles, and helicopters or instead pursue "leap ahead" technology.

The framework for this analysis is the Army After Next Project—an ongoing series of wargames, workshops, studies, and conferences which explore the feasible strategic environments of the 2020-2025 period and speculate on the sort of technology, force structure, and operational concepts that the U.S. Army might need. One of the most crucial parts of the Army After Next process has been identifying the most likely or dangerous type of enemy. Speed and Knowledge, which was the first annual report of the Army After Next Project, singled out a "major military competitor." This would be a nation-state that threatens the United States or U.S. interests but cannot or does not emulate the digitised American military. Such an enemy would attempt to offset technological inferiority with relatively cheap counters such as land and sea mines, distributed air defence, coastal sea craft, submarines, inexpensive cruise and ballistic missiles, and unsophisticated weapons of mass destruction which have become, as Richard Betts points out, weapons of the weak rather than

the most advanced. Quantity would substitute for quality. The Army After Next Project seeks to design a force with superior operational and decisional speed, strategic mobility, and battlefield awareness to defeat such a “major military competitor.”

The Army After Next Project assumes that precision weapons will make the battlefield of 2025 so deadly that the defensive will be strengthened, making extended manoeuvre possible only when the enemy’s advanced systems have been degraded and when one’s own forces have very high degrees of mobility and speed. Mobility and speed will allow distributed, decentralized, high tempo operations with what are described as “cascading” effects. “Tactical success,” according to the second annual report of the Army After Next Project, “piled up nearly simultaneously across the entire battlespace, could then lead under the right circumstances to rapid operational-level disintegration as the enemy’s plans are first foiled and then shattered—even as his ability to control his own forces evaporates before he can respond.”

The Army After Next will be built on knowledge accruing from advanced information technology, specifically an integrated, multilayered system of systems that fuses information from a variety of sources and provides “a coherent, near real time, common picture of the battlespace.” The Annual Report states that “knowledge is paramount. . . . the unprecedented level of battlespace awareness that is expected to be available will significantly reduce both fog and friction.” It continues:

Knowledge will shape the battlespace and create conditions for success. It will permit…distributed, decentralized, non-contiguous operations…It will provide security and reduce risk. Through the identification of enemy strengths, weaknesses, and centres of gravity, coupled with near complete visibility of friendly force status and capabilities,
knowledge will underwrite the most efficient application of all elements of military power—enabling higher tempos of operations. Knowledge will also focus and streamline the logistics support required to maintain high tempos.

Organizationally, the Army After Next Project anticipates a hybrid U.S. Army combining very advanced components with “legacy” forces. This will include: contingency forces including Battle Forces, Strike Forces, Campaign Forces, Homeland Defence Forces, and Special Forces. Through this combination, the future U.S. Army would retain flexibility and be able to operate in coalition with allies who had not built “digitised” forces. Throughout the Army After Next Project’s studies, programs, wargames and seminars, though, emphasis remains on countering cross-border aggression against a state where the United States had economic interests (usually petroleum) by another state using combined arms warfare with a few additional technological twists and capabilities. Invariably, the “blue” forces emerge victorious leaving the Army unprepared to think about the consequences of or responses to defeat.

The U.S. Air Force’s vision of future war is also characterized by a combination of creativity and conservatism. The Air Force 2025 study, commissioned by the Chief of Staff of the Air Force, was an cauldron of new, creative thinking. It solidified the position of the Air University as the U.S. military’s cutting edge source of ideas. Often using teams with a senior researcher of colonel or lieutenant colonel rank and a number of majors, Air Force 2025 explored topics such as information warfare, unmanned aerial combat platforms, organizations to deal with the grey area between peace and war, and ways to most efficiently erode an enemy’s unity and will. To some extent, the Air Force is more open to innovative strategic concepts than the other services, particularly the Army and the Navy. The Air Force Strategic Plan notes that exotic technologies such as micro-technology, biotechnology, and nanotechnology could alter the shape of future battlefields. But generally, Air Force’s senior leaders see future warfare as an extrapolation of the 1990s.

The Air Force Strategic Plan indicates that non-state enemies and asymmetric strategies will pose challenges and the U.S. military must become more proficient in environments like the infosphere, space, and urban areas, but assumes continuity in American strategy and in the overall nature of armed conflict. Ironically, the Air Force planning document notes the ongoing diffusion of information technology and the commercialisation of space, but does not suggest that these might challenge the notion of "information superiority" on which Joint Vision 2010 is built. The sea services also subscribe to the notion that future warfare will be a high-tech version of late 20th century combat. But the Marines, at least, are looking seriously at fairly radical changes in tactical and operational procedures, including new organizations and doctrine. In fact, the Marines are in many ways the service most amenable to true transformation. For instance, the Marine Corps After Next (MCAN) Branch of the Marine Corps Warfighting Laboratory is exploring what it calls a "biological systems inspiration" for future warfighting.
According to its web site:

. . . for the last three centuries, we have approached war as a Newtonian system. That is, mechanical and ordered [sic]. In fact, it is probably not. The more likely model is a complex system that is open-ended, parallel, and very sensitive to initial conditions and continued "inputs." Those inputs are the "fortunes of war." If we assume that war will remain a complex and minimally predictable event, the structures and tactics we employ will enjoy greatest success if they have the following operational characteristics:

· dispersed
· autonomous
· adaptable
· small

The characteristics of an adaptable, complex system closely parallels biology. For that reason, much of the efforts of MCAN focus on exploiting biological inspiration in future military systems. To move in this direction would require technology like biomimetic engineered materials; small, "bug like" robotics; neural or neuronal nets capable of complex, adaptive responses; parallel computers; and, nanotechnology. But there is more to it than that. What the Marine Corps After Next group is grappling with—to use a phrase that is close to becoming a cliché—is a "paradigm shift." The futures-oriented programs of the others services focus more on "paradigm refinement"—doing what they have traditionally done better through new technology and its associated concepts and organizations. The real issue becomes whether the Marines can truly undertake a paradigm shift while the other services, the Department of Defence, and some of the key leaders of the Marine Corps concentrate on paradigm refinement.

The end of the Cold War largely eradicated the primary mission of the Navy: retaining control of the seas in the face of enemy seapower. In response, the Navy has shifted its focus from fleet encounters and protection of sea lines of communication from hostile forces to influencing events on land via Marine Corps operations and strikes launched from the sea. To do this, the Navy plans to continue using existing weapons platforms, particularly carrier battlegroups, surface platforms, and multi-purpose submarines. It talks of decisive victory in future war using cruise missiles, naval aviation, and better target acquisition. The Navy holds that "sea strike"—attacking targets on land from the sea, is a "revolutionary" concept. Because of the massive cost of a ship, the Navy concentrates more on applying new technology to existing or proposed ones rather than the development of whole new weapons platforms as the Air Force and Army prefer.

What this means is that great efforts are going to have to be made to protect things like surface ships that emit an immense electronic signature, particularly as more states develop precision

weapons, weapons of mass destruction, and improved means of target acquisition through things like the purchase of commercial overhead imagery. While many theorists contend that "if it can be found, it can be destroyed" is one of the "rules" of the current revolution in military affairs, the Navy assumes that this is either not true, or will not hold for America's enemies. To a great extent, this is one more illustration of the hubris that pervades the official American perspective on future warfare. Unassailable American technological superiority and "full spectrum dominance" are articles of faith. Like the Army and Air Force, the Navy is exploring a different approach to warfare (albeit using existing platforms). In the case of the Navy, this is called "network-centric warfare" in which a postmodern military using networked sensors, decision makers and shooters collapses an enemy's will to resist quickly and efficiently.

According to Vice Admiral Arthur K. Cebrowski, President of the Naval War College, network-central warfare, "enables a shift from attrition-style warfare to a much faster and more effective warfighting style characterized by the new concepts of speed of command and the ability of a well-informed force to organize and coordinate complex warfare activities from the bottom up." A military which masters network-centric warfare, according to its adherents, will achieve information superiority, reach out long distances with precision weapons, and collapse an enemy's will through the shock of rapid and closely linked attacks.

Elsewhere within the Department of Defence, the search continues for ways of applying new technology to traditional modes of armed conflict. The joint experimentation program at JFCOM is an important part of this. It remains to be seen, though, whether this will incorporate analysis of true paradigm shifts in addition to paradigm refinement, and whether the results of the experiments will have a meaningful effect on the services, the Department of Defence, Congress, and other national political leaders at least as long as the threat to American security remains manageable.

Other pockets of innovation and creativity exist through the Department of Defence. For instance, the Pentagon's Office of Net Assessment, which was the birthplace of American thinking on the revolution in military affairs, has developed an Operational Concepts Wargaming Program to explore the ideas outlined in JV 2010.

The Defence Science Board has done some useful thinking about a new land-based military unit which reflects the operational preferences and technological capabilities of a postmodern military. This new unit would be light, agile, and potent. It would operate in a distributed and desegregated fashion, utilizing high situational awareness generated by information technology, depending on remote fires, connected by a robust information infrastructure, and supported by precision logistics.

Such an organization could provide a rapid intervention capability and prepare the way for heavier units, which would arrive later. It would fight for two weeks or less and then either be reinforced or withdrawn. The basic element would be "combat cells" which would make extensive use of unmanned vehicles and robotics, using humans "only when necessary." They would avoid direct firefights, remaining dispersed most of the time for survivability, massing only to repulse a major attack. Information technology would be central: "A key capability for combat cell mission success is maintaining a local awareness bubble larger than the enemy's." Along similar lines, a study group at the Department of Defense's Center for Advanced Concepts and Technology has explored the concept of "rapid dominance" attained by "shock and awe." This is a very important attempt to integrate a psychological dimension into mainstream thinking on the revolution in military affairs. The goal is to use a variety of approaches and techniques to control what an adversary perceives, understands, and knows.

To do this, a rapid dominance military force must have near total or absolute knowledge and

understanding of itself, the adversary, and operational environment; rapidity and timeliness in application; operational brilliance in execution; and near total control and signature management of the operational environment. It is not clear, though, what effect an inability to attain one or more of these things might have on a postmodern military. While attaining a perfect picture of the battlefield would give the U.S. military great advantages, reliance on this would also be a vulnerability. Might the future U.S. military become so accustomed to the absence of the fog of war that it could not overcome imperfect knowledge when it does occur? As one dimension of the paradoxical logic of strategy, weakness sometimes begets strength and strength sometimes begets weakness. Eventually, this intricate conundrum might erode the battlefield advantage of the American armed forces.

All of the services agree that the future U.S. military needs some sort of highly capable, rapidly deployable expeditionary unit. The core concept behind this is "strategic preclusion" which, in a crisis, would allow the U.S. military to achieve battlefield dominance before an enemy has completed "operational set." This would force the opponent to either concede or face inevitable defeat. Again, the expectation is that future warfare will be a reprise of Desert Shield/Desert Storm—unambiguous, cross-border aggression by one state against another. The services, however, offer few explanations of why American political leaders would use military force early in a crisis when they traditionally consider it a last resort. Similarly, there is little indication of how the various future strike and expeditionary forces might be used against non-traditional enemies or ambiguous aggression. "Strategic preclusion" may be an example of the tendency to prepare to fight the previous enemy rather than future ones.

The official vision of information warfare follows a similar logic. Joint doctrine defines information operations as "actions taken to affect adversary information and information systems while defending one's own information and information system." Despite immense debate within the services and the Department of Defence, the general notion is that information is an "enabler" of traditional forms of military activity, "an amalgam of warfighting capabilities integrated into a CINC's theatre campaign plan. . . ."

While official thinking accepts the fact that information technology has had a revolutionary effect, this revolution is thought to have cemented the strategic realities of the past, particularly the technological advantage held by the U.S. military rather than creating new vulnerabilities or the potential for enemies to match or surpass the United States. The American technological advantage is an article of faith in official thinking, largely because of the extent of investment and effort devoted to it. Little consideration is given to the creativity that might be born from the desperation of America's enemies.

The official American view of the future consistently treats technology, particularly information technology, as a force multiplier rather than as a locomotive for revolutionary transformation. Concepts such as "strategic preclusion," "full spectrum dominance," and "information superiority" reflect the situation of the 1990s—a qualitatively dominant U.S. military focusing on deterring or defeating traditional cross-border aggression. Most official documents accede that future enemies will attempt asymmetric methods, but it is what might be called a "moderate" asymmetry rather than a radical type.

Official discussions of technologies that appear to have the potential to be truly transformative—nonlethal weapons, strategic information warfare, robotics, and so forth—are conservative, seeing these things as support systems in conventional warfighting rather than new modes of warfare. With the exception of adding three new tasks for the U.S. military—space operations, information warfare, and homeland protection—the official vision anticipates few if any

strategic shifts. 21st century war, according to official thinking, will be mirror late-20th century war, with new technology allowing future generals and privates to do what past warriors could only dream of.

http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=226
