PRELIMINARY OBSERVATIONS:

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The concept of asymmetrical warfare is a popular and much discussed issue in U.S. defense literature these days. *Joint Vision 2010* (*JV 2010*),[2] the *Quadrennial Defense Review* (QDR),[3] and the *National Military Strategy* (NMS)[4] are just a few of the documents that express concern about it. Understandably, the Secretary of Defense has made addressing the phenomenon a central theme of his administration.

All of that said, what exactly is meant by asymmetrical warfare? In broad terms it simply means warfare that seeks to avoid an opponent's strengths; it is an approach that tries to focus whatever may be one side's comparative advantages against its enemy's relative weaknesses.[5] In a way, seeking asymmetries is fundamental to all warfighting. But in the modern context, asymmetrical warfare emphasizes what are popularly perceived as unconventional or nontraditional methodologies.

For most potential adversaries, attacking the United States asymmetrically is the only warfighting strategy they might reasonably consider for the foreseeable future. The Gulf War was an object lesson to military planners around the globe of the futility of attempting to confront the United States symmetrically, that is, with like forces and orthodox tactics.

In this essay I briefly examine how the West's cultural disposition and mindset affect its concept of asymmetrical warfare. I contend that the West's current focus may leave it vulnerable to asymmetrical challenges that arise from opponents whose cultural perspective differs significantly from that of the West.

Technology-Oriented Asymmetries.

In the West in general, and America in specific, asymmetrical warfare is frequently conceived in technological terms. *JV 2010* states, for example, that "our most vexing future adversary may be one who can *use technology* to make rapid improvements in its military capabilities that provide asymmetrical counters to US military strengths. . . ."[6] Unsurprisingly, therefore, weapons of mass destruction and information warfare are often proffered as illustrations of the asymmetrical warfare genre.[7]

The technological orientation of the Western mindset is to be expected. In his book, *On the Origins of War*, Donald Kagan writes that the scientific revolution ongoing since the 16th century has had a profound effect on the West. As a result, he maintains,

> It is a special characteristic of the modern Western world, as opposed to other civilizations and the premodern Western world, to believe that human beings can change and control the physical and social environment and even human nature.[8]

In due course, faith in the efficacy of technology and scientific methodology invaded thinking about warfare. That technology proved important to the military dominance of the West for over a century only reinforces the idea that it will continue to drive military success in the future.[9]

Furthermore, focusing on technology reflects the quintessential American approach to waging war. Historians Allan R. Millett and Peter Maslowski declare that since the mid-19th century (but particularly in the 20th century) the United States has relied upon "increasingly sophisticated technology to overcome logistical limitations . . . and to match enemy numbers with firepower."[10] This emphasis comports with America's sense of itself. The comments of General George S. Patton, Jr., typify the classic American view:

The Americans, as a race, are the foremost mechanics of the world. . . . It therefore behooves us to devise methods of war which exploit our inherent superiority. We must fight the war by machines on the ground, and in the air, to the maximum of our ability.[11]

This concentration on technology continues today. *JV 2010*, the "operationally based template"[12] as to how America will fight future wars, centers on the question of how to "leverage technological opportunities to achieve new levels of effectiveness in joint warfighting."[13] Clearly, the American "mindset" (if not that of the West generally) tends to see all difficulties—even the complex challenge of war—as technical problems subject to engineered solutions.[14]

Culturally-Oriented Asymmetries.

War does, of course, present technical problems but is not itself one. It is instead a contest of human wills that transcends the logic of the physical sciences. Importantly, it is also more than simply a violent form of a Westernized notion of politics. Indeed, the Clauswitzean mantra of the U.S. defense establishment, i.e., that war is an extension of politics by other means, has been much deconstructed by the work of John Keegan and others who address war's cultural basis.[15]

Complementing Keegan's thesis is that of Samuel Huntington. He argues that future conflicts will likely be clashes between civilizations with fundamentally different psychological orientations and value sets. Huntington maintains that certain ideas define what it is to be Western, and therefore add to what might be called the "Western mindset." These include such concepts as "individualism, liberalism, constitutionalism, human rights, equality, liberty, the rule of law, democracy, free markets, [and] the separation of church and state."[16]

What is important about Huntington's work is that he reminds us that the rest of the world does not necessarily

share these values. Thus, we should not expect that they will think the same way as the West about many subjects, including warfare. Lieutenant General Li Jijuan of the Chinese People's Liberation Army recently observed that "each civilization has its own notion of war which cannot help but be influenced by its cultural background."[17]

Nevertheless, an appreciation for the fact that other civilizations may look at war from a fundamentally different perspective is not only unknown to many in the West (and Americans especially) but wholly counter-intuitive to them. Americans persistently seem to assume that other peoples think basically the same as they do. Along these lines, Edward L. Rowney, a retired Army lieutenant general and former U.S. arms control negotiator, commented recently that:

> Our biggest mistakes stem from the assumption that others are like us, when in fact, they are more unlike than like us. We insist on ascribing to others our cultural traits, not recognizing that we have different objectives due to our unique historic backgrounds and sets of values. In short, "We fail to place ourselves in the other person's moccasins."[18]

When this obtuseness towards the mindset of our adversaries is allowed to affect strategic thinking, asymmetries result. H. R. McMaster argues in his book, *Dereliction of Duty*, for example, that the graduated application of airpower during the Vietnam War—intended to signal our resolve to support South Vietnam yet do so in a way that the United States believed demonstrated restraint—wholly misperceived North Vietnamese thought processes. McMaster contends:

> Graduated pressure was fundamentally flawed. . . . The strategy ignored the uncertainty of what was *the unpredictable psychology of an activity that involves killing, death, and destruction.* To the North Vietnamese, military action, involving as it did attacks on their forces and bombing their territory, was not simply a means of communication.

Human sacrifice in war evokes strong emotions creating a dynamic that defies systems analysis quantification.[19]

The technological orientation of the Western mindset along with the assumed universality of Western values distorts the analysis of asymmetrical warfare. Consider the potential dangers of technology-based asymmetries. The West readily examines them because solving that kind of problem plays to the West's own notion of its comparative advantage, i.e., in the areas of weapons innovation and production. Such perceived "technological" asymmetries are almost welcomed by the West's military-industrial complex.

The much-ballyhooed Revolution in Military Affairs (RMA) exemplifies this trend. The RMA seeks to produce radically more effective militaries through the widespread application of emerging technologies, especially advanced computer and communications systems.[20] While it provides enormous opportunities for sales of new equipment to Western forces fearful of technological obsolescence, much of the new weaponry too often seems optimized for high-tech, peer-competitor war. In other words, it is aimed principally at a form of warfare that is symmetrical (in relation to the West) in its essence. In truth, few potential adversaries will wage symmetrical, high-tech war against the United States because doing so presents enormous training, logistical, and resource requirements, and these are "demands that few societies can meet."[21]

The characterization of weapons of mass destruction (WMD) as asymmetrical threats is a further manifestation of the West's analytical distortion. In truth, the premise that WMD constitute asymmetrical threats *vis-à-vis* the West—at least insofar as inter-state war is concerned—deserves challenge.[22] Given the West's still-sizable nuclear arsenals and its *relatively* robust capability to deal with other-than-nuclear WMD warfare, are WMD really asymmetrical to the West? So long as the West maintains its current capabilities, it seems rather unlikely that an

adversary could *decisively* employ WMD against it. In a very real sense, using WMD against the United States and other Western nations would represent an ill-considered attempt to match the West *symmetrically*.

The use of WMD in the context of terrorism committed by non-state actors is, of course, a profound and different challenge. As serious a problem as terrorism is—especially when WMD are involved—it is not likely to actually defeat the West. It does not yet appear that non-state actors could mount a sufficiently comprehensive attack to physically vanquish a nation like the United States. Martin Van Creveld has pointed out that terrorism has never succeeded in the West because the nature of modernity is that it provides redundancies that give advanced societies resiliency against the sort of sporadic attacks that terrorists carry out, even though individual incidents might be quite costly.[23]

The "Real" Asymmetrical Challenge .

Quite clearly, terrorism principally aims to affect its targets more *psychologically* than physically. To that extent it does suggest the real asymmetrical challenge for the West. Major General Robert H. Scales, Jr., the Commandant of the Army War College, argues that in future conflicts an enemy may perceive his comparative advantage against the United States and the West not in technological terms, but in the "collective psyche and will of his people."[24] In turn, this generates an obvious question, i.e., how will an enemy attack the West's psyche and will? The answer makes Americans and others in the West uncomfortable because it raises the specter that basic Western values, the very things Huntington sees as defining the West, are in fact the asymmetries that future adversaries will most likely seek to exploit.

The potential asymmetrical vulnerabilities about which the West should be concerned are not so much technological as the Western mindset believes (and even prefers), but

rather are those that turn the fundamentals of the West's culture and political system against itself. For example, among the things that adversaries have learned in the latter half of the 20th century is to exploit the West's democratic system. Consider the remarks of a former North Vietnamese commander: "The conscience of America was part of its war-making capability, and we were turning that power in our favor. America lost because of its democracy; through dissent and protest it lost the ability to mobilize a will to win."[25] Thus, by stirring up dissension in the United States, the North Vietnamese were able to advance their strategic goal of removing American power from Southeast Asia.

More recently, by dragging the body of a U.S. soldier through the streets of Mogadishu, the Somalis were able to destroy the public support upon which the United States and other Western democracies depend upon to sustain military operations. We should expect such strategies to proliferate as new communications technologies vastly enhance the newsgathering and dissemination capabilities of international media organizations.[26]

Enemies may perceive vulnerable asymmetries in what the West views as its virtues. While the mindset in the United States and the West sees, as *JV 2010* says, the "moral strengths" and the "ethical standards" of its troops as keys to military power,[27] adversaries willing to abandon Westernized legal and ethical regimes may well consider them as things to exploit and manipulate.[28] Increasingly, opponents will seek to present Western militaries with moral and ethical conundrums. For example, the Serbs were able to discourage high-tech NATO air attacks by the simple expedient of chaining hostage UN troops to potential targets.[29] The idea of purposely killing friendly troops in order to destroy an enemy target will be very difficult for Western forces to rationalize.

Where once the "Western way of war" meant that adversaries risked wars often characterized by decisive

battles where the annihilation of enemy forces was sought,[30] today we see the emergence of a Western mindset markedly more sensitive to casualties on *both* sides.[31] Enemies may consider this humanitarian concern as yet another asymmetry on which they can capitalize in ways the Western mindset considers unthinkable: they may purposely put their own people in jeopardy if doing do complicates or adversely affects the West's use of its military power.

Indeed, Somali warlords used women and children as human shields against coalition forces during the intervention of the early 1990s. Along similar lines, the Libyans have threatened to encircle a facility alleged to be involved with the production of weapons of mass destruction with "millions of Muslims" in order to deter attacks by the West.[32] Most recently, when Western military action seemed imminent, Saddam Hussein surrounded his palaces and other buildings with noncombatant civilians (some of whom may have genuinely volunteered) in order to discourage attacks by Western forces sensitive to the effect on their publics of civilian deaths, regardless of the circumstances.[33] Analyst James F. Dunnigan cautions that "if the opponents are bloody-minded enough, they will always exploit the humanitarian attitudes of their adversaries."[34]

Even those opponents—including possible peer competitors—who seek to achieve technological asymmetries over the West may likewise find it profitable to use our values against us. The West's free-market, open-competition economic system encourages innovation and quickly produces technological advances. But the nature of that system in a democracy makes turning new ideas into deployed weapons a cumbersome and lengthy process—something extremely worrisome in an age of rapid technological change.

An adversary less constrained by the political realities of a capitalistic democracy may be able to gain an

asymmetrical advantage by deploying the latest systems more rapidly than can the bureaucratically-restrained Western militaries. Author David Shukman explains:

> While the Western military struggles for a decade on average to acquire new weapons, a country with commercially available computer equipment and *less rigorous democratic and accounting* processes could field new systems within a few years. It is the stuff of military nightmares.[35]

Parenthetically, it is unlikely that the openness of democratic societies will allow the achievement of an asymmetrical advantage via technological surprise against future adversaries, despite the West's best efforts. Ephraim Kam asserts in *Surprise Attack* that "since it takes a long time to produce and deploy new weapons in sufficient quantities capable of changing the military balance between nations, information on their characteristics usually becomes available in the interim."[36] While many opponents will lack the resources to develop technologically superior countermeasures, they may nevertheless be able to develop low-tech offsets as has been done with some regularity in the past.

In fact, an over-emphasis on technology can cause the West to overlook the many low-tech ways in which adversaries might asymmetrically respond to gadgetry-obsessed—and gadgetry-vulnerable—Western opponents.[37] What is so remarkable about this is that so few seem to remember the lessons of relatively recent history. Two senior U.S. military commanders warn against the siren song of technology in the Autumn 1997 issue of *Parameters*. They point out that:

> [Technological] supremacy could not prevent Holland's defeat in Indonesia, France's defeats in Indonesia and Algeria, America's defeat in Vietnam, the Soviet Union's defeat in Afghanistan, or Russia's more recent defeat in Chechyna. All these episodes confirm that technological superiority does not automatically guarantee victory on the battlefield, still less the negotiating table.[38]

Future adversaries may wage asymmetrical warfare by combining available low-tech equipment with a culturally-oriented strategy. For example, Marines should expect to face opponents who deploy relatively unsophisticated mines, much as Iraq did during the Gulf War, in the hopes of replicating the Iraq's success in deterring an amphibious assault following damage by mines to the U.S.S. *Tripoli* and the U.S.S. *Princeton*.[39] Similarly, opponents will likely acquire small, diesel-powered submarines to present the same threat.[40] What is important here is that such schemes might not be able to stop a determined assault, but an adversary may intend to simply exploit the growing aversion to casualties in the West's culture by causing some losses which would, in turn, erode support for the West's military effort.

Surface ships may face an even more insidious threat: an enemy could use a civilian airliner covertly loaded with explosives to launch an attack on a high-value target such as an aircraft carrier. The plane might be flown by a suicide pilot (or automatically guided) and carry a hostage or even volunteer group of civilian passengers. Recalling the recriminations that followed the accidental shootdown of an Iranian airliner by the cruiser *Vincennes*,[41] the adversary may hope to create just enough hesitation on the part of the ship's crew to allow the aircraft to successfully penetrate the defenses. Again, simply causing casualties—in this scenario both U.S. military personnel and enemy civilians—would be the aim.

It is paradoxical that these kinds of enemy actions against forward deployed American forces might engender a completely different reaction than acts of terrorism against the U. S. homeland. Although the objective of both might be to maximize casualties, the former could succeed in undermining public support for an overseas operation while the latter may well evoke a demand for extreme measures against the perpetrators. Such is the mercurial nature of contemporary U.S. public opinion.

In any event, the kind of asymmetrical warfare future adversaries may wage is not that which seeks to actually defeat U.S. or Western military forces, but rather that which assaults the psyche and will of the populations whose political support is required by Western democracies to sustain military operations.

Conclusions.

Hopefully, this essay will not be interpreted as an anti-technology, Luddite manifesto. To the contrary, no one—least of whom the author—disputes the dictum that "technology and warfare have never been far apart."[42] Moreover, it is unquestionably true that decisionmakers must be extremely concerned about procuring the finest technology for U.S. forces. Analysts Ronald Haycock and Keith Neilson warn that to a great extent military applications of technology have "permitted the division of mankind into ruler and ruled."[43] And it is also still true that technology is the West's comparative advantage.

One of the great dangers, however, is that decisionmakers may delude themselves into thinking that the challenge of asymmetrical warfare is *exclusively* technological. It is especially a concern as more and more of the civilian leadership lack first-hand military experience. This has led some military officers to worry, as the *Wall Street Journal* reported in 1995, that such leaders might believe that "gadgets can somehow substitute for the blood and sweat of ground combat."[44]

The West must recognize that consideration of war as a technological or engineering problem has its limits. The engineer's culture is an "aggressively rational one" where technical problems are solved with a logical application of scientific principles."[45] War, however, is something different. Lieutenant General Paul K. Van Riper, USMC, explains:

> Technology permeates every aspect of war, but the science of war cannot account for the dynamic interaction of the physical and moral elements that come into play, by design or by chance, in combat. War will remain predominately an art, infused with human will, creativity, and judgment.[46]

What is necessary for the United States and the West is to expand its assessment of asymmetrical warfare. Asymmetrical warfare needs to be examined from the culturally distinct perspective of potential enemies. As unpleasant as it may be, the West must consider that enemies may try to turn against us the very values that the West is seeking to protect. In particular, the United States and the West must not allow its technologically-oriented mindset to blind it to the fact that modern war remains, as already noted, a struggle of psyches and wills.

The West must be prepared to meet the moral as well as technical challenge of future war. Enemies may concede that physically defeating the military the forces of the United States and the West is beyond their capability, but nevertheless attempt to achieve their war aims by overcoming the West's will, testing it in new and innovative ways. That is the essence of the challenge of asymmetrical warfare in the 21st century. To the extent that we indulge ourselves with visions that success in future war can be reduced to finding high-tech "silver bullets," all that the West holds dear is in peril.

ENDNOTES

1. Presented originally on November 20, 1997, in Cambridge, MA, to "The Role of Naval Forces in 21st Century Operations" Conference sponsored by the Fletcher School of Law and Diplomacy of Tufts University, the Institute for Foreign Policy Analysis, the Commandant of the U.S. Marine Corps, and the Chief of Naval Operations, U.S. Navy.

2. Chairman of the Joint Chiefs of Staff, *Joint Vision 2010,* 1996.

3. William S. Cohen, *Report of the Quadrennial Defense Review*, May 1997.

4. Chairman of the Joint Chiefs of Staff, *National Military Strategy of the United States of America,* September 1997.

5. Other authorities define asymmetrical warfare somewhat differently. For example, in its unclassified report on the exercise STRATEGIC FORCE '96, the Air Force discussed the issue as follows:

> The symmetrical battles have classically pitted steel against steel in slow wars of attrition. Asymmetrical warfare departs from this thinking. Asymmetrical warfare avoids traditional force-on-force battles. Asymmetrical warfare favors pitting your strength against an enemy's strength or weakness in a nontraditional and sometimes unconventional manner.

Department of the Air Force, *Strategic Force*, 1997, p. 8.

6. See *JV 2010,* pp. 10-11.

7. See, e.g., *ibid.,* p. 11, (information technologies); *QDR,* p. 4, (NBC [nuclear, biological, and chemical] threats, information warfare); and *NMS,* p. 9, (WMD and information warfare).

8. Donald Kagan, *On the Origins of War and the Preservation of Peace*, 1995, p. 3.

9. See Michael Howard, *War in European History*, 1976, pp. 116-135.

10. Allan R. Millett and Peter Maslowski, *For the Common Defense*, 2d ed., 1994, p. xii.

11. As quoted by Colin S. Gray, "U.S. Strategic Culture: Implications for Defense Technology" in Asa A. Clark IV and John F. Lilley, eds., *Defense Technology*, 1989, p. 31.

12. *JV 2010,* p. ii.

13. *Ibid.,* p. 1.

14. See Robert N. Ellithorpe, *Warfare in Transition? American Military Culture Prepares for the Information Age*, a presentation for the Biennial International Conference of the Inter-University Seminar on Armed Forces and Society, Baltimore, MD, October 24-26, 1997, p. 18 (unpublished paper on file with author). ("American military culture historically emphasized scientific approaches to warfare to the point of

holding an almost mystical belief in the power of technology to solve the challenges of war.")

15. See John Keegan, *A History of Warfare*, 1993. Harry Summers maintains that Keegan makes a false distinction between "politics" and "culture." See Colonel Harry G. Summers, Jr., USA, Ret., *The New World Order*, 1995, pp. 40-42.

16. See Council on Foreign Relations, *The Clash of Civilizations? The Debate*, 1996. Huntington has expanded his thesis to a book-length treatise entitled *The Clash of Civilizations and the Remaking of World Order*, 1996.

17. Lieutenant General Li Jijuan, *Traditional Military Thinking and the Defensive Strategy of China*, LeTort Paper No. 1, U.S. Army War College, Strategic Studies Institute, Earl Tilford, ed., August 29, 1997, p. 1.

18. Edward L. Rowney, "Tough Times, Tougher Talk," *American Legion Magazine*, May 1997, pp. 24-26.

19. H. R. McMaster, *Dereliction of Duty*, 1997, p. 327, emphasis added.

20. For discussions of "the revolution in military affairs" in the information age, see generally "Select Enemy. Delete.," *The Economist*, March 8, 1997, p. 21; Eliot A. Cohen, "A Revolution in Warfare," *Foreign Affairs*, March/April 1996, p. 37; Andrew F. Krepinevich, "Cavalry to Computers: The Pattern of Military Revolutions, *The National Interest*," Fall 1994, p. 30; and James R. Fitzsimonds and Jan M. Van Tol, "Revolutions in Military Affairs," *Joint Force Quarterly*, Spring 1994, p. 24.

21. Geoffrey Parker, "The Future of Western Warfare," in Geoffrey Parker, ed., *Cambridge Illustrated History of Warfare*, 1995, p. 369.

22. Military historian Martin Van Creveld makes the interesting observation that, ironically, "in *every* region where [nuclear weapons] have been introduced, large-scale, interstate war has as good as disappeared." Martin Van Creveld, "Technology and War II," in Charles Townsend, ed., *The Oxford Illustrated History of Modern War*, 1997, p. 304, emphasis in original.

23. Martin Van Creveld, *Technology and War*, Rev. Ed., 1991, pp. 307-308.

24. As quoted by James Kittfield, in "The Air Force Wants to Spread Its Wings," *National Journal*, November 8, 1997, p. 2264.

25. As quoted in "How North Vietnam Won the War," *The Wall Street Journal*, August 3, 1995, p. A8.

26. Douglas Waller, a *Time Magazine* correspondent, observes:

> The same technology that is revolutionizing the way the Pentagon fights wars is also changing the way the media cover them. The media can now provide viewers, listeners and even readers almost instant access to a battlefield. With lighter video cameras, smaller portable computers, cellular phones, their own aircraft, and worldwide electronic linkups, the media can report on any battlefield no matter how remote and no matter how many restrictions the Defense Department tries to place on coverage.

Douglas Waller, *Public Affairs, the Media, and War in the Information Age,* a presentation for the "War in the Information Age" Conference, Tufts University, November 15-16, 1995 (unpublished paper on file with author).

27. *JV 2010*, pp. 28, 34.

28. In a fascinating piece in *Parameters*, Ralph Peters, then a U.S. Army major, described what he called the rise of "The New Warrior Class," a multitude which he contends "already numbers in the millions." Peters says that in the future,

> [America] will face [warriors] who have acquired a taste for killing, who do not behave rationally according to our definition of rationality, who are capable of atrocities that challenge the descriptive powers of language, and who will sacrifice their own kind in order to survive.

Ralph Peters, "The New Warrior Class," *Parameters*, Summer 1994, p. 24.

29. See Lieutenant Colonel Thomas X. Hammes, "Don't Look Back, They're Not Behind You," *The Marine Corps Gazette*, May 1996, pp. 72-73, discussing the military implications of chaining hostages to targets. Hostage taking was not clearly prohibited until after World War II. See H. Wayne Elliot, "Hostages or Prisoners of War: War Crimes at Dinner," *Military Law Review*, Vol. 149, Summer 1995, pp. 241-274.

Hostage taking appears to be an effective tactic. See, *e.g.,* Stephen Erlanger, "Russia Allows Rebels to Leave with Hostages," *New York Times*, June 20, 1995, p. 1. ("Nearly all the demands of Chechens are met.")

30. See, generally, Victor Davis Hanson, *The Western Way of War*, 1989; Doyne Dawson, *The Origins of Western Warfare*, 1996; and Russell E. Weigley, *The American Way of War*, 1973.

31. Walter J. Boyne notes "two unique demands that have since Vietnam come to be made by the American public":

> The first of these demands is that we must fight our wars with a minimum of casualties to our forces. America wants no more Vietnams where our troops are forced to fight and die in unconscionable numbers. The second of these demands is unusual in history, for it is that we must also win our wars with a minimum number of casualties inflicted on the enemy.

Walter J. Boyne, *Beyond the Wild Blue: A History of the U.S. Air Force 1947-1997*, 1997, p. 7.

32. See "Libyans to Form Shield at Suspected Arms Plant," *Baltimore Sun*, May 17, 1996, p. 14.

33. See Barbara Slavin, "Iraq Leaves U.S. Few Options," *USA Today*, November 14, 1997, p. 13A.

34. James F. Dunnigan, *Digital Soldiers: The Evolution of High-Tech Weaponry and Tomorrow's Brave New Battlefield*, 1996, p. 219.

35. See David Shukman, *Tomorrow's War: The Threat of High-Technology Weapons*, 1996, p. 8. See also Michael Loescher, "New Approaches to DoD Information-Systems Acquisition" in *Cyberwar: Security, Strategy and Conflict in the Information Age*, Alan D. Campen, *et al.*, eds., 1996, p. 127 ("In a world in which state-of-the-art is off-the-shelf, industry, and potentially our foes, can obtain better information systems, technology cheaper and faster than DoD because our current acquisition system buys computers in the same way we buy bullets"); and Jeffery R. Barnett, *Future War*, 1996, p. 17, stressing the need to compress the procurement time for information technologies.

36. Ephraim Kam, *Surprise Attacks*, 1988, p. 19.

37. See, *e.g.,* Charles J. Dunlap, Jr., "How We Lost the High-Tech War of 2007," *The Weekly Standard*, January 29, 1996, p. 22.

38. Lieutenant General Paul K. Van Riper, USMC, and Major General Robert H. Scales, Jr., USA, "Preparing for War in the 21st Century," *Parameters*, Autumn 1997, pp. 4-5.

39. Although the absence of an amphibious assault during the Gulf War was later characterized as a deception operation, General Schwarzkopf's memoirs make it clear that concerns about mines were key. See General H. Norman Schwarzkopf, *It Doesn't Take a Hero*, 1992, p. 446. See also Rick Atkinson, *Crusade*, 1993, pp. 239-240.

40. For a discussion of how a few submarines can complicate a military operation, see, generally, Admiral Sandy Woodward, *One Hundred Days*, 1992 (Falklands War).

41. On July 3, 1987, the cruiser U.S.S. *Vincennes* shot down Iranian Air flight 655 over the Persian Gulf when it mistook the civilian aircraft for a military threat. Killed were 224 adults and 65 children. See Sandra Mackey, *The Iranians*, 1996, p. 331.

42. Ronald Haycock and Keith Neilson, *Men, Machines, and War*, 1988, p. xi.

43. *Ibid.*, p. xii.

44. Thomas E. Ricks, "Gingrich's Futuristic Visions for Re-Shaping the Armed Forces Worry Military Professionals," *Wall Street Journal*, February 8, 1995, p. 16.

45. Robert Poole, *Beyond Engineering*, 1997, p. 209.

46. Lieutenant General Paul K. Van Riper, "Information Superiority," *Marine Corps Gazette*, June 1997, pp. 54, 62.