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# Leaving the Technocratic

# TUNNEL

By GARY W. ANDERSON and  
TERRY C. PIERCE

There is an emerging consensus that the success of exotic weapons in the Persian Gulf War and promise of high-tech gadgetry marked the beginning of a military revolution. It is believed that such stunning technology has ushered in a new era of warfare by combining long-range precision strike with powerful overhead sensors and high-tech equipment. Unfortunately, being mesmerized by technology may result in a narrow view of RMA. Admittedly something profound and perhaps catastrophic is occurring. Sweeping changes are underway that could totally transform war. But the common view of RMA—the system of systems that gathers near-perfect information to locate and destroy every target in an oddly specific area of two hundred square miles—does not capture the far-reaching implications of a revolution.<sup>1</sup>

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## Revolutions

A profound change that sweeps aside old ways and imposes new ones generally qualifies as a revolution. Most military revolutions have been enabled by technologies such as the longbow, gunpowder, and internal combustion engine. But these innovations did not constitute a revolution in themselves. Real revolutions such as *Blitzkrieg* and amphibious warfare came from outside the military. Only later did the doctrine and organizations needed to integrate the technology develop.<sup>2</sup> Ultimately, however, a revolution is too powerful and widespread for a military institution to direct or influence profoundly. The military does not drive a revolution; a revolution drives the military.

Why do the proponents of a system of systems which is made possible by the information revolution vaunt it as a genuine RMA? A glance into the recent past sheds light on this standpoint. During the Cold War, the Nation preserved a commanding technical lead in crucial military systems such as ballistic nuclear missiles and precision-guided weapons. These systems largely depended on technologies that were essentially military-exclusive. Thus, it was easy to gain a technological monopoly on such military systems

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>1996</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-1995 to 00-00-1996</b>	
4. TITLE AND SUBTITLE <b>Leaving the Technocratic Tunnel</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>National Defense University, Institute for National Strategic Studies, 260 Fifth Avenue SW Bg 64 Fort Lesley J. McNair, Washington, DC, 20319</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>7</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

because the government had the economic means and political will to pursue and sustain R&D. This Cold War perspective has been carried into the information age. As a result, RMA adherents envision that we will experience an easy revolution brought on

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solely by a similar kind of technical supremacy which will translate into a profound military edge. But this brief era of military-exclusive technology is quickly ending. The dominant technological development now is the so-called information revolution, and it has arisen outside the military.

It is important to distinguish here between *information warfare* and *information revolution*. The former represents "The struggle between two or more opponents for control of the information battlespace."<sup>3</sup> The latter is much broader and consists of the technical and economic upheaval caused by disproportionate growth in processing power and accessibility to individuals and small groups. Again, we must realize that the information revolution is occurring outside the

military. As a result potential adversaries have excellent, if not equal, access to emerging information technology, and they will likely use it in clever ways to gain military leverage against U.S. systems and doctrine.

While the information revolution has only begun to affect the military, we cannot escape it. It will drag us into the future whether we want to go or not. We must thus find a way to adapt. Because the information revolution is essentially technical, discussion of this vision of RMA has tended to take us on a technocratic trip through the narrow tunnels of academe with only occasional intimations that larger truths lie outside. This is reminiscent of an earlier revolution in medicine in which a benign transformation occurred more or less automatically by the discovery of a wonder-drug. In 1933 sulfanilamide (an antibiotic) cured a German child who was dying of a bloodstream staphylococcal infection and began a period of profound change in medicine. The revolution was so great that within a lifetime whole classes of infections ebbed from the industrialized world.

Like their medical counterparts, RMA adherents tend to think in terms of wonder weapons with magical properties.<sup>4</sup> However, even the greatest cure

is not a cure-all. At first, people were euphoric about the potential of sulfanilamide. But before long the unprecedented success of such drugs brought new problems that we were previously spared, such as cancer and other ailments of a longer-lived population.

A similar euphoria surrounds the information revolution. Some propose that information technology will lift the fog of war, give liberal democracies a permanent military advantage over tyrannies, and provide a foolproof conventional counter to nuclear weapons, thus rendering them irrelevant.<sup>5</sup> We are urged not to consider whether this vision is plausible, much less feasible, but rather to let our imaginations leap to ideal battle outcomes such as precision strike, dominating maneuver, and information dominance. Proponents argue that these outcomes will emerge more or less automatically from a properly designed system of systems, producing a military revolution.

As generally conceived, system of systems RMA is essentially a revolution in firepower. We therefore fall into the old trap of seeking technological solutions to warfighting problems just as the French did with the Maginot Line.<sup>6</sup> Our thinking is still in an initial utopian phase with the sort of visionary optimism that accompanied the early part of the Industrial Revolution.



USS Mount Whitney  
off Haiti.

U.S. Navy (John Sokolowski)

Consequently, we are not seeing possible problems information could spur.

In the last century many informed people believed mechanization would overcome poverty and social ills, enabling civilized countries to sweep away barbarism and usher in permanent peace. It was hard for them to imagine that industrial technology would not completely abolish intractable problems, much less that it

would cause entirely new ones of undreamt magnitude.

### Military Implications

Armies and navies adapted to the Industrial Revolution by mimicking organizations that had proven successful in industrial mass production: a hierarchy designed to support highly centralized decisionmaking and close

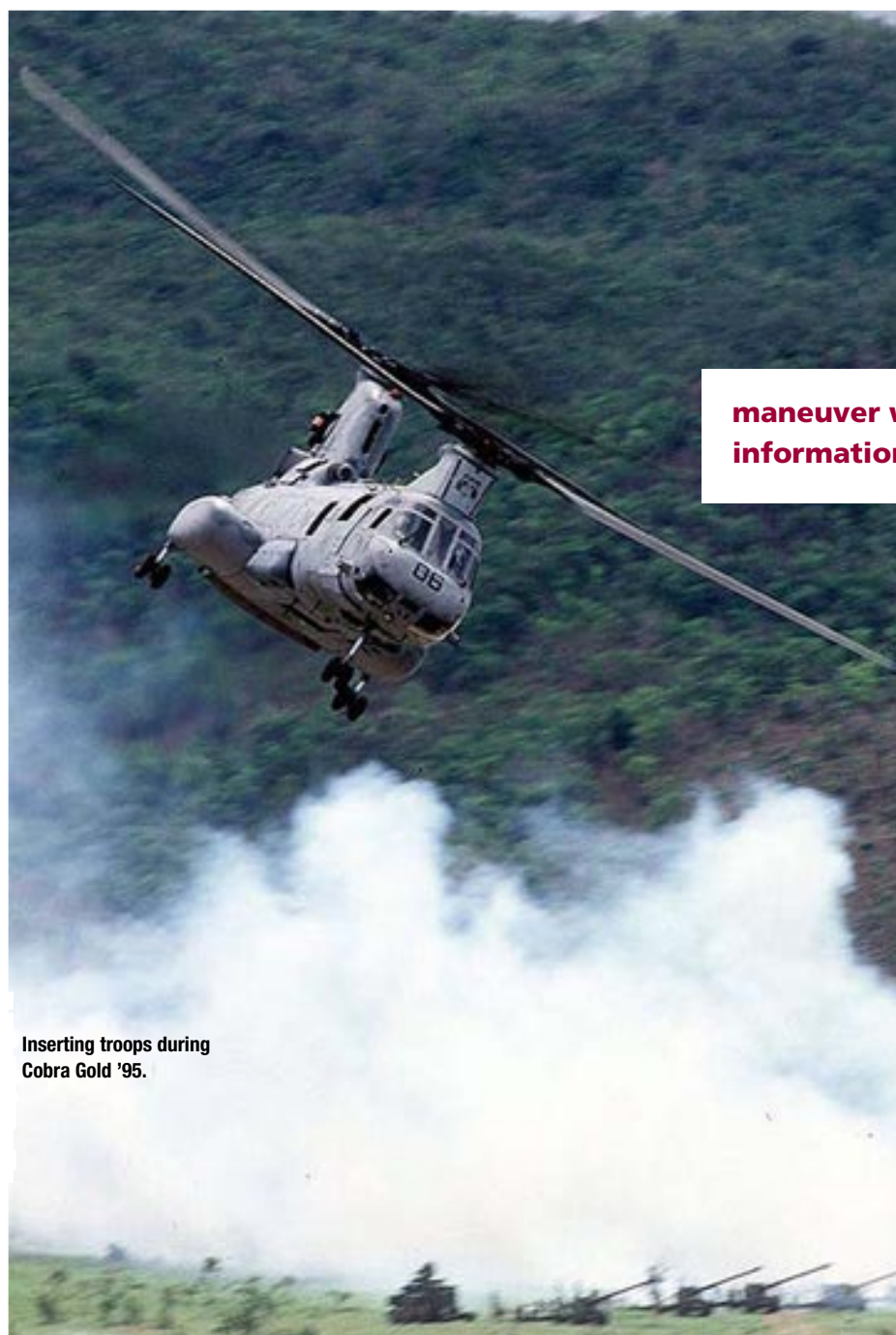
oversight. Their objective was to synchronize movement and maximize firepower, just as an industrial plant synchronized production to maximize output. Most militaries are still organized in this way and, not surprisingly, they experience difficulty in adapting to chaos and the complexity of the information age. Indeed, the exponential growth in information tends to overwhelm them, a phenomenon that Martin Van Creveld calls “information pathology.”<sup>7</sup>

This is an important concept because it emphasizes the difference between the industrial and information age, namely, how to deal with uncertainty. The industrial model can be described as a centralized *detail-control* mindset that is derived from a desire for certainty, order, and precision. The information model can be characterized as a decentralized *mission-control* mindset that stems from an acceptance of uncertainty, disorder, and friction as

**maneuver warfare recognizes that complex information systems—like war—are chaotic**

inherent aspects of war. Supporters of detail-control—that is, system of systems RMA adherents—believe that the information revolution will eventually lift the fog of war, giving commanders an omniscient view of battlespace. This is a pipe dream because war is inherently chaotic and, as a complex information network with many interconnections and feedback loops, it has an intrinsic chaos that will hobble centralized power structures. As military information architectures become more complex, they must follow the lead of Internet which empowers distributed nodes and also demands independent action. A centralized structure simply cannot direct events in such an environment or even hope to keep track of them. In other words, just as computers have flattened corporate organizational structure, the military will likewise have to restructure and flatten out its hierarchy and rely more on decentralized control.

A good example of advances in information technology forcing decentralization of controls in the civilian sector is the new “free flight” concept



Inserting troops during  
Cobra Gold '95.

Joint Combat Camera Center (Steve Thurow)





Harrier flying over landing craft.



Unloading Marine main battle tank.

Military Photography (Greg Stewart)



U.S. Navy (Jeff Ellick)

of the Federal Aviation Administration (FAA). With growing demands to save time and fuel, FAA wants to scrap detailed positive control in favor of changing air traffic control to management. With new information tools, free flight would give pilots the freedom to fly when, where, and how they choose, with both pilots and controllers sharing responsibility for safe aircraft separation. In effect, the information revolution is about to cause the broadest change to the U.S. air traffic control system since radar.<sup>8</sup>

For warfighters, adapting to the information revolution will require equally radical change. Fortunately, there is a doctrinal and organizational

framework being developed on the battlefields of the 20<sup>th</sup> century that promises to be the most effective solution for the next century. It is the doctrine of maneuver warfare, which recognizes that complex information systems—like war—are chaotic. Maneuver warfare is designed to operate in and exploit that chaos.

We are only a few decades into the information revolution, roughly where the industrial revolution stood in 1840. What can we perceive at this point, and what can we do about it? First, we can appreciate the magnitude of the problem and eschew utopian solutions that

give us a false sense of mastery and discourage real thinking. Second, we can look dispassionately at dominant trends. We should note that although technology has long tended to encourage more decentralized decisionmaking, there seems to be a trend in the military for more centralization. Finally, we can encourage innovative intellectual and organizational tendencies that appear most likely to accord with those trends, for example decentralized decisionmaking and a maneuver warfare approach in military leadership.

### Maneuver Warfare

How ready is the military to wield the new information technology that lies at the heart of RMA? With few exceptions, the Armed Forces are essentially industrial-type organizations that stress process and control and, as a result, use centralized planning and direction. Unfortunately, it is “increased operational complexity, compressed factors of time and space, and rapidly changing situations of a nonlinear, fluid battlefield” that make a centralized, industrially-organized military incapable of meeting the stress and chaos of modern combat.<sup>9</sup>

Yet the standard interpretation of RMA tends to ignore the organizational implications of information technology and seeks to directly integrate existing military organizations still attuned to the industrial model. The danger lies in implementing a system of systems using an inadequate organizational concept that cannot operate in an era of information dominance. In many ways this is what the Soviets adopted as battlefield doctrine: maneuver warfare organized under a highly centralized detail-control style. This systematic, linear, and quantifiable mindset is incompatible with the frictional, chaotic, and fluid battlefield. So the real question is what the military must do to adapt to the new information technology. The answer is simple: take the system of systems and adapt it from an organizational paradigm of centralization to one of decentralization.

The Navy-Marine Corps team is well positioned to take advantage of this paradigm shift. Neither service is tied to the industrial era concept of

mass and both have traditionally emphasized placing mass at a small and decisive point. Moreover, naval forces understand war as inherently chaotic and recognize the potential of maneuver warfare, a framework of doctrine and organization developed by the Germans in response to the stalemate of trench warfare.<sup>10</sup>

Like war, complex information systems are also inherently chaotic. Thus, we must take a much broader view of the implications of the information revolution and revamp organizational and doctrinal structures. Effective adaptation to the principles of maneuver warfare means divorcing fighting organizations from the mechanistic, centralized control of the industrial model, which has always been better attuned to the rigid order of the old assembly line than to the chaos of battle. We must seek instead a decentralized type of organization compatible with both the battlefield and the information revolution—less focused on the highly efficient production of firepower and more on the will of an enemy to resist. This is the spirit embodied in littoral competency.

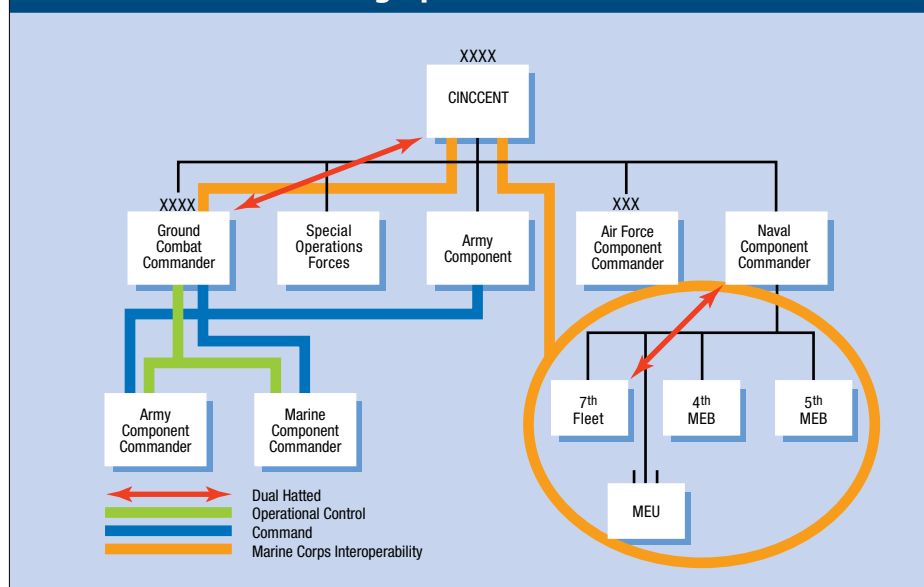
### Potential for Change

The concept of littoral competency captures this potential for real change. Not only is it designed to harness the military potential of information technologies—system of systems wonder tools—but more importantly, it is a change in doctrine and organization that is needed to adapt to the information revolution.

It has been over three years since the Navy and the Marine Corps drafted... *From the Sea* indicating their intent to adopt a mutual littoral approach as an overall contribution to joint warfare. That vision was updated in *Forward... From the Sea*. Now it is the time to translate that strategy into an operational concept, littoral competency, and into a tactical concept, *Sea Dragon*.

The Navy-Marine team can present a challenge to a warfighting CINC as seen in Operation Desert Storm. The commander in chief, U.S. Central Command (CINCCENT), had to contend with one Marine expeditionary force (MEF) assigned to the ground

### Chain of Command during Operation Desert Storm



component and four Marine air-ground task forces (MAGTFs) of two expeditionary brigades (MEBs) and two expeditionary units (MEUs) assigned to his naval component. While the sailors and marines of Desert Storm performed magnificently, their command relationships can be most charitably described as confusing. Had the marines ashore linked up with those afloat their only common superior would have been CINCCENT (see figure). Current command relationships in Korea are more convoluted. If amphibious operations were attempted, the result would more likely be a similar exercise in confusion. Simply put, CINCs in an ideal world should not have to referee naval matters, but the reality is that they must. There is a better way.

The concept of littoral competency is simple. All naval forces required to project power ashore and support shore-based naval forces operating along a littoral should come under a single commander who answers directly to a CINC. This provides a single point of contact as well as a powerful tool for exploiting naval

power-projection forces in a relatively seamless manner.

A littoral component is truly a functional component. Land, sea, and air competency can more accurately be described as elemental competency. Naval forces operating ashore, including in sustained operations, are best employed along the coast. This was the

### the biggest adjustment in littoral operations may be among the naval services themselves

case before *Forward... From the Sea* codified the focus on littoral operations. When a Marine commander wants to make a helicopter landing, he should not have to go up the chain to a CINC to "borrow" helicopters from another MAGTF or rely on an ad-hoc arrangement between the naval component commander and ground component commander (GCC). From a CINC's perspective, one call should get it all.

To make this concept operational, we must discard some old thought patterns. An MEF, oriented along a littoral, is most effective—even in sustained operations ashore—when it can work in seamless conjunction with sea-

based aviation, logistics, and naval surface fire support (NSFS). The current wisdom is that an MEF ashore in sustained operations should be a GCC asset. Littoral componentcy argues that Navy-Marine contributions should be power projection forces with their own zones which include land-based marines and the sea space required to support them in areas of responsibility belonging to CINCs or JTF commanders. In some cases, either the ground or air component commander (ACC) will be a CINC's main effort; in others, including most short-term military operations other than war, it would be the littoral component commander.

The littoral component commander battlespace is truly three-dimensional. The attitude that everything that flies must be controlled by a CINC-level joint forces air component commander (JFACC) will simply not

give the flexibility needed in littoral operations.

Ironically, the biggest adjustment in conducting littoral operations may be among the naval services themselves. For this concept to succeed, the littoral component staff must be an integrated Navy-Marine effort with officers of both services rotating command. If a marine commands, then a Navy officer should be chief of staff and vice versa. Some Navy officers are still uncomfortable with a marine directing movement of a naval task force, but they need to realize that the precedent was established in both Operations Sea Angel and Restore Hope, where a Marine JTF commander functioned as a littoral commander in all but name. The Marines, on the other hand, must adjust their thinking be-

yond the sanctity of the amphibious objective area (AOA) and inviolability of the airspace control therein. Both the amphibious objective area and amphibious command relationships were a compromise. These constructs were the best agreement possible in fighting through service rivalries in the past, but they may not be in the future.

The key to grasping littoral componentcy will be to change the view of littoral operations. In the past amphibious operations were seen as a horizontal penetration of a coast. Once an assault force seized a lodgment, heavy Army mechanized forces would come in to relieve them and a GCC would be established to continue the land operation. But how often will there really be a sustained land operation? That is the key challenge to the conventional wisdom. Military analysis since the Cold War has indicated that such campaigns will comprise only about 7 percent of future warfare, and even that estimate may be high.

The logistics needed to support a mechanized force such as that required for Desert Storm could be vulnerable to nuclear, biological, and chemical weapons of mass destruction (WMD). In military operations other than war (MOOTW) the threat might be insurgency or ethnic nationalism. By August 1993, the coalition force logistics lodgment in Somalia had become a virtual hostage of General Aideed's gunmen. Accordingly, much of the effort was directed at protecting this lifeline rather than accomplishing the mission.

Visionaries foresee a time when the Navy-Marine team bases most of the littoral component commander's fire support assets—such as the Navy's arsenal ship concept—as well as logistics at sea, allowing the littoral component to maneuver seamlessly up and down the coast to accomplish military objectives without a large footprint ashore.<sup>11</sup> Naval fire support and aviation assets also can be seamlessly transferred ashore when necessary. In most situations, a ground component in the conventional sense might not be needed at all.

Therefore we may need to start picturing joint operations vertically rather than horizontally. In this paradigm Navy and Marine forces move up



**USS Wasp during  
Support Democracy.**

U.S. Navy (John Sokolowski)



and down the coast with no permanently fixed lodgment that an enemy could target. If a fixed lodgment is needed for heavy Army and Air Force operations, it could be provided via other sea or air assets.

The littoral component commander controls the coastal regions while GCC moves inland if necessary. Boundary adjustments are made by

## our fascination with technology has led us to believe that we are driving RMA

simple movement of component boundaries instead of establishing and disestablishing AOAs. Should ACCs have their own areas? This is debatable. If so, the areas should be sufficiently far from the littoral component commander and GCC front lines to allow these commanders to shape the battlefield as they see fit.

How can the Navy and Marine Corps drive this vision? It may mean a radically different approach to naval warfare. Placing Army tactical missile or multiple launch rocket systems aboard Navy ships would be a major step. Advanced precision guided technology is on the horizon; and distributed, shop-to-consumer, sea-based logistics which eliminate large supply dumps is possible. Tanks may be obsolete by 2020 because of precision guided munitions. The MV-22 and CH-53E (or its successor), combined with carrier-based air and RMA weaponry, may render conventional land-based, tube artillery obsolete within 300 miles of the coast. The day might also come when JFCs only need a littoral component commander and ACC for an operation.

The current concern over roles and missions should not be focused on whether naval forces should have tanks or fixed-wing manned aircraft. Both in fact may be sunset systems, a point that remains open to debate. One should not defend any capability without considering the future of war. The real debate should be over new concepts to guide new paradigms.

## Enter Sea Dragon

U.S. forces could implement the vision of littoral componentency by

means of a combination of tactics, techniques, and procedures roughly grouped under Sea Dragon: a view of naval combat in which platoon-sized groups from the sea range over a battlefield, bringing down accurate fire on an enemy in unprecedented volumes. The object is to make platoons as capable as battalions once were. If we achieve this vision with sea-based fire support and ship-to-objective logistics, we can create a genuinely different approach to warfighting. By elimi-

nating large formations in one place to dominate the battlespace, we can fight smarter, more economically, and with fewer casualties.

The Sea Dragon initiative calls for a radically new, decentralized style for our landing forces which will have eyes everywhere but will present large fixed targets nowhere. What they can see, they can kill. Their battlefield will be a distributed one where to mass is to die. In Marine forces ashore, sergeants will do what captains did previously; lieutenants will command battlespace once covered by lieutenant colonels. Anything big and slow will become a target and will be destroyed on sight. Traditional artillery, tank formations, and massed armored infantry will become liabilities rather than advantages.

The way wars are fought is going through a dramatic transformation. Though not without merit, the system of systems concept—composed of precision strike, dominating maneuver, space and information warfare, and such—does not in and of itself constitute a revolution. Our narrow fascination with technology has led us to believe that we are driving RMA. But nothing could be farther from the truth, and we cannot afford such technical arrogance. We must realize that we do not have a monopoly on new technology. Consequently, we must creatively adapt both doctrine and organizations to these innovative technologies.

In the long run we must recognize that revolutions only indicate the direction in which we are heading. These trends should not be regarded as the definitive future of war. We must re-

main open to new ideas and developments, such as littoral componentency and Sea Dragon, and move out of the narrow tunnels of technocratic thinking by making decisions based on logic and experience. This will ultimately be a source of strength and ensure that any potential enemy who ventures near the littorals will become a victim, not a victor.

JFQ

## NOTES

<sup>1</sup> William Owens, "The Emerging System of Systems," *Military Review*, vol. 75, no. 3 (May–June 1995), pp. 15–19, and "Breakthroughs Could Give Forces Total Command of Future Battlefield," *Inside the Navy* (January 23, 1995), p. 3.

<sup>2</sup> Earl Tilford, Jr., *The Revolution in Military Affairs* (Carlisle Barracks, Pa.: U.S. Army War College, 1995), p. 12.

<sup>3</sup> U.S. Department of the Navy, *Copernicus . . . Forward, C4I for the 21st Century* (Washington: Government Printing Office, 1995), p. 7.

<sup>4</sup> Kenneth F. McKenzie, Jr., "Beyond the Luddities and Magicians: Examining the MTR," *Parameters*, vol. 25, no. 2 (Summer 1995), p. 15.

<sup>5</sup> Michael Mazarr, *The Revolution in Military Affairs: Framework for Defense Planning* (Carlisle Barracks, Pa.: U.S. Army War College, 1994), pp. 30–31.

<sup>6</sup> Ralph Peters, "After the Revolution," *Parameters*, vol. 25, no. 2 (Summer 1995), p. 8.

<sup>7</sup> Martin Van Creveld, *Command in War* (Cambridge: Harvard University Press, 1985), pp. 248–49.

<sup>8</sup> Bruce D. Nordwall, "Cultural Shift Key to New Concept," *Aviation Week and Space Technology*, vol. 143, no. 5 (July 31, 1995), pp. 40–41.

<sup>9</sup> Terry C. Pierce, "Taking Maneuver Warfare to Sea," *U.S. Naval Institute Proceedings*, vol. 121, no. 4 (April 1995), p. 74.

<sup>10</sup> U.S. Department of the Navy, *Naval Doctrine Publication 1, Naval Warfare* (Washington: Government Printing Office, 1994), pp. 31–34.

<sup>11</sup> Pierce, "Taking Maneuver Warfare to Sea," pp. 74–77.

This article was submitted as an entry in the 1995 RMA Essay Contest.