



Laptop user on beach during exercise.

U.S. Navy (Terry A. Cosgrove)

THE ONCE AND FUTURE Revolution in Military Affairs

By WILLIAM A. OWENS

It is hard to gauge precisely when the current American revolution in military affairs began. It was clearly underway by the mid-1990s. Within the Pentagon, the Director of Net Assessment, Andrew Marshall, claims that Soviet observers of

the United States were concerned about it in the late 1970s. Some historians point to the period of post-Vietnam introspection in the mid-1970s as the origin. Thus the Nation has been engaged in—or at least on the cusp of—such a revolution (or military transformation) for the better part of two decades, a time span roughly equal to two earlier military revolutions, the interwar transformation and nuclear revolution.

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Kandahar airport,
Enduring Freedom.

U.S. Marine Corps (Charles G. Grow)

The Beginnings

There was rumbling about a revolution immediately after the Vietnam War. As the focus of national security planning shifted back to defending Europe against the heavily armed, numerically superior forces of the Warsaw Pact, the United States confronted severe challenges because much had changed while it was preoccupied in Southeast Asia. It was evident by the mid-1970s that the Soviet Union was building a formidable submarine force that made the concept of close-in defense of vital lines of communications across the Atlantic and Pacific Oceans increasingly questionable. Likewise, new generations of nuclear and conventional Soviet weapons required novel approaches by the Army and Air Force to maintain the credibility of deterrence in Europe. It was in this milieu that technologies and operational

concepts arose that would be central to the revolution.

The Navy reasoned, for example, if close-in defense of vital sea lines was increasingly tenuous, that it would be feasible to defend forward—bottling up enemy submarines before they could reach the open sea—and threaten Soviet territory from the northern Pacific, Norwegian Sea, and eastern Mediterranean. And if this meant going into harm's way, why not spread the defense of the fleet outward, develop communications and collaborative defenses to compensate for distance, and push the ability to grasp Soviet action in deeper, more detailed, and timely dimensions? These changes laid the groundwork for what is known as network centric warfare.

If NATO forces could no longer rely on superior weaponry to oppose the Warsaw Pact with an impenetrable wall of steel, why not have the Army strike deeply behind the front, putting

time and distance gaps into the orderly flow of the enemy? And if such a strategy demanded more reach, higher precision, and real time, comprehensive awareness of what was occurring in a vast battleground, why not develop the communications, precision weapons, and intelligence system to provide it? This approach paved the way for Air-Land Battle and the digitized Army.

And if Soviet air defenses made penetration based on speed and high altitude problematical, why not develop technology for the Air Force that offered invisibility and precision weapons, backed by real-time awareness to enhance effects of economic, information, military, and political systems? That also happened, enabling stealth and nodal effects-based operations.

Throughout the 1980s the Army, Navy, Marine Corps, and Air Force con-

tinued to develop revolutionary ideas. Thus the roots of a new generation of weapon systems, communications, and intelligence collection took hold. But the services worked largely independently, under an implicit understanding that there would be enough funds to go around. Budget projections stated as much, and for most of the decade projections of the Soviet threat indicated that it had to be so.

Budget trend lines fell in 1986, but the dominant view was that this activity was temporary. Indeed, even in the face of the undeniable Soviet collapse six years later, national security strategy issued by the outgoing administration called on planners to prepare for a reconstitution of the threat posed by Moscow or a similar global threat that fueled defense planning for half a century.

The Middle Period

Desert Storm marked the end of the Cold War and beginning of the middle phase in the revolution, revealing the promise of technology and concepts begun in the 1970s. It was not only a vision of precision-guided

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weapons striking intended targets that stirred imaginations. Some less notable innovations also worked. Global positioning opened a new chapter in military navigation. The digital terrain data demonstrated that objects could be located in three-dimensional space. The Internet augmented communications. The advantages of precision, reach, battlespace awareness, space-based observation, and advanced communications became prominent in the Armed Forces. Military professionals worldwide saw that the United States had a considerable lead in fulfilling the promise of the new weaponry, communications, and intelligence.

Desert Storm also revealed how much was left undone—the Nation still fought essentially as it had half a century earlier. Responsibilities were allocated among the services as they were in Vietnam, carefully delineating

areas of control and responsibility in a manner that suggested that joint campaigns were little more than three separate campaigns on the ground, at sea, and in the air. Just as the Armed Forces began to recognize the power of new technology, they started to identify their inability to communicate across service lines, let alone share battlespace knowledge. Planners increasingly appreciated that such technical difficulties were rooted in deeper differences of service culture, procedures, and operational concepts. Though not a revelation, this development did point to a sense that divisions—or stovepipes as some call them—were not only quaint, but dangerous. They hindered the ability to accelerate and take full advantage of technologies that promised greater effectiveness. And as the ability to accelerate the pace of operations rose, stovepipes enhanced the danger of fratricide.

The focus of the middle age of the revolution between 1991 and 1997 was jointness. The refrain of revolutionaries was: the technology exists—it's stovepipes that hinder us from using it to its full potential—let's break up the stovepipes. The last point is easier said than done. Much that happened in the post-Vietnam era bolstered parochialism. Passage of the Goldwater-Nichols Act was a striking contradiction because it invested significant authority in the Chairman to transcend individual service views or an amalgam of service perspectives. But the law also militated against support of service prerogatives, cultural separateness, and diverse operational concepts.

Military professionalism under the All Volunteer Force contributed to the general success of Desert Storm but also to the earlier tragedy of Desert One. That failed rescue triggered Goldwater-Nichols, for professionalism had been increasingly defined and honed by the individual services. Moreover, the end of the draft led to change in institutions outside the military. Fewer members of Congress and civilian officials within the Pentagon with oversight responsibility had actual military experience. Thus they tended to accept what



F-22 over Edwards Air Force Base.

U.S. Air Force (Andrew Dunaway II)

senior officers claimed as requirements, albeit slowly and incrementally. And because the services viewed requirements through parochial lenses, a joint perspective remained the sum of four sets of needs, mostly unleavened by cross-service review or awareness of how the requirements and perspectives of one service affected others.

The revolutionaries sought to defeat parochialism with a broadly based assault. One axis of attack had to do with erecting a new conceptual framework that some called the *system of systems*. This concept depicts war as a deadly contest in which the side that best understands the battlespace and can best transfer that knowledge among its own elements to apply force faster, more precisely, and over greater distances wins. The key was seeing power in functional interactions and synergy. The framework suggested nothing about domains, service roles, responsibilities, or requirements.



MV-22B lifting vehicle
aboard USS Saipan.

U.S. Navy (Title Mr. Ackerman)

Thereby it established a context in which discussion could move away from numbers of platforms and items that the services deemed as needs. Requirements were defined in terms of their ability to enhance the capacity to understand the complexities of combat, communicate, and deliver violence with speed, precision, accuracy, and effect over greater distances.

This framework served as the foundation for *Joint Vision 2010* which, among other things, attempted to push the general system of systems concept into a more explicit operational template. It also provided working assumptions for an assault on the great bastion of service parochialism, the presumed authority to define military requirements solely in terms of service interests.

Yet more than a conceptual framework was needed, and revision of the Joint Requirements Oversight Council (JROC) and the formal role of the Chairman in the planning, programming, and budgeting system (PPBS) were important supplements. The former involved efforts to transform the role of JROC members (service vice chiefs of staff) from essentially representing the services in the early stages of major acquisitions into a military

board of directors charged with addressing what was best for the Armed Forces and national security. The PPBS revision involved expanding the Chairman's Program Assessment and also issuing the Chairman's Program Recommendations. The JROC revision sought to stop the services, when ostensibly acting collectively, from defining requirements in terms of the sum of their desires or a lowest common denominator. The program assessment and recommendations served as hammers in that these documents became vehicles for the Chairman, as sole military advisor to the President and Secretary of Defense, to impose a joint perspective on requirements if the services could not reach one.

It is worth noting the rhetoric invoked by the Pentagon during the mid-1990s, a time that was characterized by a revolutionary vocabulary. The most obvious example was the growing use of the term *revolution in military affairs*, or RMA. That spawned subterms such as *revolution in defense business affairs* and *revolution in defense*

both presidential candidates during the 2000 campaign endorsed transforming the military

acquisition. These terms were loaded because a revolution signals the need for relatively radical, rapid change.

The Thermidor

Rapid, significant change in military institutions does not usually occur except in the wake of defeat. But the Armed Forces maintained their superiority during the conflicts of the last decade of the 20th century. Nevertheless, the record was marred by events such as the Blackhawk shutdown, Khobar Towers bombing, and difficulty in getting Apache helicopters into the conflict with Serbia in Kosovo. Yet it was easy to miss the significance of these events—all of which reflected in part the continued pernicious effects of stovepipes—against the background of successes in Bosnia, Serbia, and both Operations Northern and Southern

Watch, along with the greater effectiveness of weapon systems and command, control, communications, computers, intelligence, surveillance, and reconnaissance (C⁴ISR) entering the force. Thus, as some believe happens in all revolutions, the American RMA entered its Thermidor phase in the late 1990s.¹

The first indication of the slowdown emerged in the proposal by the National Defense Panel that the less unsettling term *transformation* should replace the revolution in military affairs. There were signs within the Pentagon in 1998 that a retrenchment was underway. JROC procedures had returned to the bureaucratic patterns of the late 1980s. Time expended by the vice chiefs on JROC affairs dropped, while time spent by the more recently established lower-ranking screening panels expanded and JROC procedures returned to practices that had long been associated with summing divergent service goals. The Chairman's Program Recommendations vanished. *Joint Vision 2010* was replaced by *Joint Vision 2020*, pushing operations contemplated for 2010 out another decade. The joint experimentation program, imposed on the Pentagon by Congress in 1999, was funded at less than one percent of what

most revolutionaries thought was needed. The defense budget, again rising fairly steeply, was driven by the same priorities on maintaining existing force structure, the normal pace of modernization, and procuring major systems designed for the Cold War era.

Both Presidential candidates during the 2000 campaign endorsed transforming the military, and the Bush administration, led by Secretary of Defense Donald Rumsfeld, pushed for steps that echo the revolutionary goals and approaches of the mid-1990s. Program and budget decisions by the administration, however, do not yet reflect its transformational rhetoric.

The State of the Revolution

The Thermidor may be ending. The current administration has brought in people like Vice Admiral Arthur Cebrowski, USN (Ret.), as Director of Force Transformation, as well as others who have both a profound

1st Combat Camera Squadron (Lisa Zunanyika)

grasp of the American RMA and a definite inclination to accelerate it. There is mounting evidence that concepts like dominant battlespace knowledge, advanced, robust communications, and precision weapons—and greater combat tempo, network-centric operations, and nodal warfare that such concepts enable—offer extraordinary military effectiveness. And new operational approaches and military organizations are emerging.

Officers who worked in and for the revolutionary vision and drive of recent years are now generals and admirals. More of them will soon be promoted to four-star rank. So what's really changed over the last decade? Several significant differences together could tip the United States into the revolution on which it has verged for almost a generation.

The first is conceptual. Many revolutionary assumptions have become part of conventional wisdom. Most military professionals know that revolutions in military affairs arise from more than technological advances. A decade ago the discussion on the base force essentially accepted the fact that

while improved technology and force reductions were inevitable, organizational change within the services and new operational concepts were not on the table. Today the dominant assumption is that leaps in military effectiveness are not possible without significant changes in organizational and operational concepts. Likewise, concepts underlying such hoary terms as *system of systems* or *dominant battlespace knowledge*—not just the rhetoric—are entering budget decisions.

Technology is having the anticipated effects. Ten years ago revolutionaries postulated that improved weapons precision and accuracy, better battlespace knowledge, and more comprehensive communications would reduce casualties, enhance joint warfighting, change international relations, and create new political-military possibilities. Today planners assume reduced friendly casualties (perhaps mistakenly, but with growing empirical support). The communications difficulties faced by the Navy in operating with ground and ground-based air forces in Desert Storm are gone and, as Operations Allied Force and Enduring Freedom indicate, joint operations are far more effective. The political-military effects are less clear, but it is hard

to believe that the Armed Forces would be operating from bases in the former Soviet Union except for U.S. technological leverage. And the concept of deterrence has arguably been altered by the precision, speed, range, and effectiveness of emerging technology.

Although uneven and slow, organizational change is now a fact. Air expeditionary forces are very different from the structure of the 1980s. The Navy routinely combines air, surface, and submarine components in much more flexible structures than a decade ago and for the first time can communicate more directly with the Army and Air Force. The Army is moving toward significant structural and organizational changes. And the notion of standing joint forces is taking root in the unified command system.

The Armed Forces operate differently. The Army truly owns the night. A new air-ground operational concept is emerging from the conflict in Afghanistan. Ground forces almost routinely operate from naval platforms in ways that were considered novel just a decade ago. Operational concepts based on attrition are being

abandoned in favor of network centric warfare.

An optimist might argue that because the glass is half full, we should simply let nature take its course in the incremental, cautious manner that has paid off handsomely over the last ten years. The United States is militarily superior. There is some indication that its superiority is increasing. So why not stick with a winning strategy? A strong optimist, however, might argue that instead of letting changes accumulate at the pace of the last decade, the

transformation is a process with two dimensions, one universal and the other relative

process must be accelerated, bringing about an earlier change in state.

Why Accelerate?

Reaccelerating the American revolution in military affairs will enhance national security and support foreign policy goals, while bolstering U.S. influence around the world. It is also obvious that threats to national security in the foreseeable future will be quite different from those in the last half century for which the Armed Forces were originally designed. Sticking with that force does not enhance security and may reduce it for a variety of reasons. In large part, potential enemies no longer strive to match American military power symmetrically. Instead they are building military and paramilitary capabilities to enable them to fight asymmetrically. They might take advantage of seams between components, counter mass with agility, and hide in urban areas, difficult terrain, or locales where mass becomes a liability.

Both Serb forces in Kosovo and al Qaeda fighters in Afghanistan attempted asymmetry. The United States was successful in those conflicts primarily because of revolutionary advances in agility, battlespace knowledge, and an ability to strike with precision. The Armed Forces should not be designed for that same sort of opposition. But the way in which the enemy sought to fight is instructive in terms of what to expect, and not only from weak forces like the Serbs or Taliban. Such enemies

can best be deterred and defeated by consolidating the revolution in military affairs. As for peer competitors who may develop the capabilities to confront a revolutionized American military, the solution is winning the race and not opting out.

Does accelerating transformation jeopardize the ability to fight by getting out too far ahead of allies? The evidence supports the opposite interpretation. It was U.S. superiority, particularly taking advantage of battlespace knowledge with speed and precision, that strengthened alliances in both the Balkans and Afghanistan. In part this is because the potential of the emerging information age military can be transferred to weaker nations. Unlike the industrial age, battlespace knowledge can be readily shared. It has political advantages that enable friendly forces to be far more capable. Moreover, many capabilities are based on commercial information and telecommunications; hence transformation will be easier to share and implement in allied militaries. As such it is a fulcrum for stronger alliances, not weaker ones.

Ultimately, the effect of military superiority depends less on its source than on what is done with it and how friendly forces operate. To the extent it deters hostile acts, it has inherent capacity to assure both allies and friends. An agile military that can move quickly and decisively and then remove itself with dispatch can add to that assurance. In short, though nations may be suspicious of a single superpower that outshines them, the character of the military of that power can mitigate that reaction. A ponderous, indiscriminate military, marked by mass and dependency on overseas basing, whose operational concept is rooted in attrition warfare, is likely to evoke distrust among allies, friends, and observers. Would Russia, Tajikistan, Turkmenistan, Uzbekistan, and Pakistan have been as cooperative in the conduct of Enduring Freedom if the operation had involved a more massive, long-term U.S. presence and footprint on their territory?

The Competition

The American RMA, which demonstrated its potential in Desert Storm, Bosnia, Kosovo, and Afghanistan, has stirred a new competition. It is the nature of military affairs. Transformation is a process with two dimensions, one universal and the other relative. It is universal in the sense that all militaries experience it. No force is entirely static today. Everything can change, driven by competition, technology, politics, and societal shifts. Militaries are moving in the same direction, from the attributes of the industrial age to those of the information age. In general, they are getting better at using violence effectively, for information age militaries are inherently more effective.

Transformation is also relative. While militaries may all be moving in the same direction, they are moving at different speeds. Those that are farther along have handily defeated those more common to the industrial age. Because relative effectiveness is a function of where in the transition antagonists are located, the competitive strategy of those ahead is to maintain their lead while those behind must reduce the gap.

Less advanced militaries need not repeat steps taken by organizations in the lead to achieve information age capabilities. Unlike investments in industrial capacity that generated tanks, ships, and planes that were hallmarks of the industrial age, many information age standards are available without staggering investments in capital. This produces two strategic effects. It provides states or groups lacking the power, wealth, and organizational ability of the United States with a potential for great destruction. And it means the Nation must transform to maintain its advantage.

How to Accelerate

Accelerating the revolution in military affairs is not so much a matter of new technology as of organizational, structural, and operational changes to exploit technological innovation. Though it was instituted in October



Aboard *USS Coronado*,
Tandem Thrust '01.

USS John S. McCain (Andrew Meyers)

1999 to stimulate military transformation, the experimentation mission of U.S. Joint Forces Command has neither the authority nor the resources to accomplish that task. It can lead only when the services have no interests at stake. Moreover, experimentation is funded at a level below that needed to gauge the best ways to capitalize on technology. Experiments tend to look at ways of modifying current procedures to achieve higher efficiency. In the future efforts should expand to embrace different organizational and structural approaches.

During peacetime, service components assigned to regional commands often do not train or act jointly, making them less capable of working together. Components are essentially unaware of technological and operational approaches of other components, and in actual operations that takes too much time to discover. The Armed Forces should not undertake any operation with pickup teams composed of components that are not truly joint. Consideration is reportedly being given to establishing standing joint task force command staffs, but that is not enough. Standing joint forces must be organized at the three-star level, rotate command among services, and compel components of each standing joint force to operate together in peacetime as they would in conflict.

Most current training, testing, and exercising of forces assigned to unified commands occurs within stovepipes. That ratio should be reversed, ideally with standing joint commands.

Joint experimentation—unconstrained in scope and devoted to defining military structures, organizations, and operational approaches that offer the best promise from new technology—joins joint standing forces as the most efficient, effective, and expeditious means of designing the future in parallel with improving the ability to fight jointly.

The Armed Forces must develop an approach to post-Cold War planning and programming that builds a civilian-military collaborative force. The current process affords too much initiative to the services in establishing requirements. That imbalance must be corrected and civilian influence must be reinvigorated. This does not mean a return to the contentiousness of the 1960s, when an activist Secretary of Defense established a planning, programming, and budgeting system that still exists. The model should be the system that emerged in the mid-1990s: a collaborative effort that uses the authority of the Chairman to force cross-service tradeoffs—a revitalized Joint

Requirements Oversight Council (and drop the term *oversight* and call it simply the Joint Requirements Council). This council would include senior players of the Office of the Secretary of Defense as full members whose primary role in acquisition, planning, and programming would serve as a board of directors to build the new military; two-year budgeting authority; and, most controversial but most needed, pulling service chiefs away from defining requirements and toward procurement, recruitment, and training to complement what the council designs and the Secretary and President approve.

Funding for C⁴ISR and networking technologies must be clearly designated. There should be full accountability to Congress and the public for such funding decisions. Spending in this area must increase severalfold. It is hard to find adequate resources for satellites, communications, data links, and sensors as well as to make sense out of the C⁴ISR priority. The language in the budget is always reassuring, but verifying the numbers to carry out the plan is another matter.

None of the above steps will be automatic or easy to achieve. The Department of Defense can't take them without the support of Congress and the American people. They are revolutionary, but the United States is a revolutionary Nation. **JFQ**

NOTE

¹ The term comes from a classic study of revolutions by Crane Brinton, who argues that most political revolutions pass through a counterrevolutionary period—the *Thermidor* (a reference to the dates of the demise of Citizen Robespierre during the French Revolution). See Crane Brinton, *The Anatomy of Revolution* (New York: Vintage Books, 1965).