1 MILITARY REVOLUTIONS AND THE IRAQ WARS

1991, A New Kind of War?

The conduct and outcome of the first Iraq War in 1991 came as some-thing of a revelation to the majority of Americans who had little reason to follow the previous decade's advances in military technologies and innovations in war-fighting doctrine. It was, in the words of Colin Gray, "a flash in the sky of strategic consciousness."[1] The war's conduct was unusual in that weeks of relentless bombing preceded engagement with Iraqi ground forces, leaving many wondering when the real war would begin. In the absence of actual ground combat by the coalition, pressure mounted to let the American people know exactly how Kuwait was going to be liberated. Generals Colin Powell and Norman Schwarzkopf agreed on the need to provide more information about the war's progress and the plan for victory. At a news conference a week into the war, they explained the coalition's actions and strategy. Powell described the plan to defeat the Iraqi army in vivid terms: "Our strategy to go after the enemy is very, very simple. First we're going to cut it off and then we are going to kill it."[2] Powell and Schwarzkopf arrived at the press conference armed with visual aids. After showing footage of a lone car crossing a bridge through crosshairs, Schwarzkopf declared the driver the "luckiest person in Iraq" as a guided bomb raced toward the bridge, hitting it dead-on just as the car appeared to reach safety on the other side. The assembled press corps giggled. This was only the beginning of a steady stream of such images. Government buildings, critical infrastructure, Iraqi planes, and their bunkers and munitions depots were destroyed with a deadly precision reminiscent of video games. Whether such images accurately

[1] Quoted in Lusaz Kamienski, "Comparing the Nuclear and Information RMAs," *Strategic Insight* Vol. 2, No. 4 (April 4, 2003). Accessed at: www.ccc.nps.navy.mil/si/apr03/strategy2.asp.

[2] Stephen Budiansky, *Air Power: The Men, Machines, and Ideas That Revolutionized War from Kitty Hawk to Iraq* (New York: Penguin, 2004), p. 423.

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reflected the air war as a whole is another matter. As portrayed at the time, however, the war was clearly not a repeat of World War II. There were no fleets of aircraft dropping thousands of bombs and razing entire cities. This was not aerial bombing as most people remembered or imagined it. This imagery contributed to a sense that this was a different kind of war, an impression only magnified by the war's unexpectedly lopsided result. Despite dire prewar predictions of coalition casualties in the thousands, only 147 American and 99 other coalition soldiers were killed in action.[3]

Not everyone, however, was completely surprised. For at least a decade before the war, many in the Department of Defense and wider strategic community had been talking about a contemporary "revolution in military affairs" (RMA), a change in warfare that might prove as profound as the introduction of gunpowder weapons in the fourteenth century. Just as advances in information technology were transforming economic and civilian life, so too did many expect a similarly revolutionary transformation of warfare. These arguments progressed on two levels. On a theoretical level, there was speculation about the future of warfare in general that transcended any immediate national concerns. On a more practical level, predictions of an RMA were associated with a policy agenda emphasizing the exploitation of technological advances to preserve and even improve the United States' long-term strategic position. Many of those advancing this agenda were instrumental in shaping the 1991 Iraq War plan, which they saw as a proving ground, a large-scale test and demonstration of their vision of a transformed military applying new technology in innovative ways to achieve victory in war. Success in 1991 was taken as vindication of previous defense policy decisions as well as a green light to continue along the same path. The Iraq War brought these ideas and policy agendas, which were already familiar to readers of military journals, into full public view.

Whether or not observers accepted or even cared about predictions of an emergent RMA, it was difficult to analyze the 1991 Iraq War without using language suggesting that significant, even revolutionary, military changes were underway. Robert Citino thinks the war revealed "a *quantum* leap in the quick flow of information, always the thorniest command and control issue."[4] Stephen Budiansky cites the *Gulf War Air Power Survey*'s conclusion that "*never* has an air force found itself in the position of preparing the battlefield to the extent" witnessed in the Gulf War.

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[3] Alastair Finlan, *The Gulf War, 1991* (New York: Routledge, 2003), p. 85. Although there is some minor variation in these numbers, the general point that American and coalition casualties were very low by any standard is uncontested.

[4] Robert Citino, *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare* (Lawrence, KS: University of Kansas Press, 2004), p. 290, emphasis added.

He deemed this "not an idle boast."[5] Military historian John Keegan argues that "since 1991 there has been a *revolution* in accuracy, promising the results sought by air forces since the dawn of strategic bombing."[6] John House agrees: "*for the first time*, airpower at least approached the effectiveness that its advocates preached for generations."[7] George and Meredith Friedman attribute "the success of the bombing campaign in the Persian Gulf . . . [to] the *radical* revision of bombing probabilities."[8] Max Boot echoes these assessments: "precision guided weapons . . . made possible a *quantum leap* in bombing accuracy over the unguided projectiles of World War II." And even though he is somewhat skeptical of more grandiose predictions about a contemporary RMA, Boot concedes, "something *extraordinary* happened on the night of January 17–18, 1991. It was the opening night not only of Operation Desert Storm but, arguably, of *a whole new era of warfare*."[9] These are typical observations. The same adjectives tend to reappear in almost any discussion of the 1991 Iraq War – "revolutionary," "for the first time," "radical," "unprecedented," "quantum leap," and "extraordinary." Language suggesting revolutionary change pervades descriptions even in the absence of explicit references to an RMA. None of this proves that the 1991 Iraq War marked the beginning of a new RMA, but at a minimum there appears to be near-universal agreement that something important was changing.

Revolutions and Military Revolutions

People like to talk about revolutions, military and otherwise, because they are dramatic events that immediately attract attention. It would be easy to compile a long list of supposed social, political, economic, technological, medical, scientific, and intellectual revolutions. But unfortunately, the term *revolution* is more commonly used than defined. It is often employed with the implicit assumption that people already know what it means. One is tempted to draw parallels with the U.S. Supreme Court's identification of pornography as something difficult to define in the abstract but easy to recognize when encountered. Although it may be impossible to devise definitive criteria for identifying revolutions, we can at least sketch

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[5] Budiansky, *Air Power*, p. 423, emphasis added.

[6] John Keegan, *The Iraq War* (New York: Vintage, 2004), p. 142.

[7] John M. House, *Combined Arms Warfare in the Twentieth Century* (Lawrence, KS: University of Kansas Press, 2001), p. 269, emphasis added.

[8] George and Meredith Friedman, *The Future of War: Power, Technology and American Dominance in the 21st Century* (New York: Crown, 1996), p. 269, emphasis added.

[9] Max Boot, *War Made New: Technology, Warfare and the Course of History, 1500 to Today* (New York: Gotham Books, 2006), pp. 321 and 322, emphasis added.

some general guidelines for distinguishing revolutionary change that will help in thinking about a possible revolution in military affairs.

Revolutions are generally thought to involve some combination of wide-ranging, unusually significant, and/or rapid change. Theda Skocpol, for example, defines social revolutions as "rapid, basic transformations of a society's state and class structures."[10] Thus, we can think of revolutions in terms of the *scope*, *magnitude*, and *speed* of change they entail. Those revolutions universally accepted as such often display all three elements of revolutionary change. The Russian Revolution is a case in point. It was certainly wide in scope, affecting almost every facet of Russian life as the political order was upended, the economic system transformed, and social relations reconfigured. The magnitude of these changes was unusually significant: the creation of the Bolshevik dictatorship was no mere tinkering with the previous order. And the pace of change was rapid, taking just a few years. But there are also "revolutions" for which the term is used colloquially. The so-called Reagan Revolution, which entailed some relatively modest policy revisions (e.g., reduced marginal tax rates and less regulation), hardly seems worthy of the description in comparison to something like the Russian Revolution.

Of the possible elements of revolutionary change, speed may be the most problematic, particularly since *revolution* is easily juxtaposed with *evolution*, which conveys a sense of gradualism. There is little consistency on this point. While the Russian Revolution remade an entire social, political, and economic order in a short period, the Industrial Revolution did the same over a century or more. Although there is no denying the change associated with the Industrial Revolution, it is difficult to consider it rapid unless one adopts a very broad historical perspective in which several generations is not a very long time. Still, no one advocates relabeling the Industrial *Revolution* as industrial *evolution*. This suggests that speed is the most dispensable characteristic of revolutions. We are probably fortunate that debates over the RMA tend not to dwell on the issue of speed. At least implicitly, most seem to accept Andrew Liaropoulos's conclusion that "the 'revolution' in Revolution in Military Affairs should not be taken to mean the change will necessarily occur rapidly, but just that the change will be profound."[11]

While speed may not constitute an essential element of revolutions, significant change undoubtedly does. One can imagine a revolution that takes some time to unfold, but not a revolution without major change. The analytical and empirical challenge is identifying these changes and judging

[10] Theda Skocpol, *States and Social Revolutions: A Comparative Analysis of France, Russia and China* (Cambridge: Cambridge University Press, 1979), p. 4.
[11] Andrew N. Liaropoulos, "Revolutions in Warfare: Theoretical Paradigms and Historical Evidence – the Napoleonic and First World War Revolutions," *The Journal of Military History* Vol. 70 (April 2006), p. 370.

whether they constitute a "basic transformation," to use Skocpol's ter-
minology. In cases such as the Russian Revolution the answer is so evi-
dently in the affirmative that the question need not be asked explicitly.
Most cases are not as clear-cut. Barry Watts makes the valuable if some-
what obvious point that "there is no field of human endeavor in which
we possess precise, unambiguous, cut-and-dry criteria for distinguishing
evolutionary change from revolutionary change." Largely as a result of
the "inherent imprecision of our conceptual categories," we need to rec-
ognize that "such classifications are always to some degree arbitrary."[12]
But by focusing on the scope, magnitude, and, to a lesser degree, speed
of change as potential elements of any revolution, we can at least begin
to frame the issues in the debate about a contemporary RMA.

The concept of military revolutions is not new. Historians, especially
those specializing in the military history of early modern Europe, began
using the term in the 1950s to describe several periods of military inno-
vation between the fourteenth and seventeenth centuries.[13] Histories of
technology and warfare, for example, routinely discuss the development
of gunpowder weapons, particularly early cannons, during this period
under the general rubric of a gunpowder or artillery revolution.[14] The
military reforms Napoleon instituted in the wake of the French Revo-
lution are commonly referred to as the Napoleonic Revolution. More
recently, references to the post–World War II nuclear revolution have
become standard.[15] None of this has been uncontroversial. The precise
nature of military revolutions was as much a matter of contention as their
identification. Some observers identify only three military revolutions in
all of history while others claim as many as ten in just the last 600 years.
But the general notion that certain periods can usefully be described as
revolutionary because they stand out from the normal pattern of military

[12] Barry Watts, *Six Decades of Guided Munitions and Battle Networks: Progress and Prospects* (Washington, DC: Center for Strategic and Budgetary Assessments, 2007), pp. 65 and 258.

[13] Michael Roberts is sometimes credited with introducing the concept of military revo-lutions in his book *The Military Revolution* (Belfast, 1956). See also Clifford Rogers, ed., *The Military Revolution Debate: Readings on the Military Transformation of Early Modern Europe* (Westview: Boulder, CO, 1995); Geoffrey Parker, *The Military Revo-lution: Military Innovation and the Rise of the West* (Cambridge: Cambridge University Press, 1988); Brian M. Downing, *The Military Revolution and Political Change: The Origins of Democracy and Autocracy in Early Modern Europe* (Princeton: Princeton University Press, 1992); and William H. McNeill's classic *The Pursuit of Power: Tech-nology, Armed Force, and Society Since 1000* (Chicago: University of Chicago Press, 1982).

[14] See Geoffrey Parker, "The Gunpowder Revolution," in Geoffrey Parker, ed., *Warfare: The Triumph of the West* (Cambridge: Cambridge University Press, 1995), pp. 106–19; and Bruce D. Porter, *War and the Rise of the State: The Military Foundations of Modern Politics* (New York: Free Press, 1994), pp. 31–2, 37, 53, 65.

[15] See Robert Jervis, *The Meaning of the Nuclear Revolution* (Ithaca: Cornell University Press, 1990).

innovation was widely, if not universally, accepted long before the debate about a possible contemporary revolution.

The current debate is usually traced to the late 1970s and early 1980s, when Soviet military theorists began to warn that emerging technologies were creating military capabilities that might erode Soviet advantages vis-à-vis the United States and NATO in Europe. The Soviets were, for example, well aware of the United States' use of laser-guided munitions in the final years of the Vietnam War. They were particularly alarmed by the military lessons of wars in the Middle East between Israel and its Soviet-armed neighbors in which radar detection and guided munitions combined to produce shockingly high military losses on both sides, illustrating the lethality of new technologies and weapons. The Soviets feared that their forces in Europe were becoming increasingly vulnerable to these emerging technologies. Within the larger context of the information revolution, these developments convinced some Soviet theorists that a "military-technical revolution" was in the offing. And when they considered who was likely to be the major beneficiary of this revolution, they feared it was the United States, not the Soviet Union.[16]

As similar ideas took hold in the West, the concept of a "revolution in military affairs" replaced the Soviet military-technical revolution, reflecting a belief that Soviet conceptualizations exaggerated the importance of technology in relation to other elements of military change. No one questioned that technological advances were a significant component of the changes underway, but they were only part of the equation. Technological change does not automatically bring about an RMA; it merely creates the opportunity. New weapons and technologies usually need to be accompanied by military doctrine and organizational reform for their revolutionary potential to be realized. This basic insight is often illustrated with reference to the German *blitzkrieg* of World War II. The key to the *blitzkrieg*'s success was not Germany's possession of weapons that others lacked. Germany was not the only country with radios, airplanes, a mechanized infantry, and tanks. What set the Germans apart from competitors were their ideas about how these weapons could be combined and military units reorganized to take full advantage of them on the battlefield.[17]

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[16] Jacob W. Kipp, "The Labor of Sisyphus: Forecasting the Revolution in Military Affairs During Russia's Time of Crisis," in Thierry Gongora and Harald von Riekoff, eds., *Toward a Revolution in Military Affairs? Defense and Security at the Dawn of the Twenty-first Century* (Westport, CT: Greenwood Press, 2000), pp. 87–93. Also, Williamson Murray and MacGregor Knox, "Thinking about Revolutions in Warfare," in MacGregor Knox and Williamson Murray, eds., *The Dynamics of Military Revolution, 1300–2050* (Cambridge: Cambridge University Press, 2001), pp. 2–4.

[17] See James S. Corum, *Roots of Blitzkrieg: Hand Von Seekt and German Military Reform* (Lawrence, KS: University of Kansas Press, 1994); Robert Citino, *The Path to Blitzkrieg: Doctrine and Training in the German Army, 1920–1939* (Boulder, CO; Lynne Rienner,

Thomas Graves notes that "despite a vast literature on the RMA idea over the last decade, there has never been a clear consensus on the meaning and definition of a true 'Revolution in Military Affairs.'"[18] Part of the problem is that as the concept became more popular, definitions have proliferated. It is as though each analyst wants to use his or her unique definition rather than rely on someone else's. This tendency toward definition proliferation is common in the social sciences. Matters have been further complicated by the appearance of concepts in the 1980s and 1990s whose relationship to the RMA was not always clear. In addition to "military-technical revolutions" and RMAs, one encounters "revolutions in strategic affairs," "net-centric warfare," "information warfare," "fourth-generation warfare," "military transformation," and so on. Yet, despite the apparent conceptual confusion, there is enough common ground in the most commonly accepted definitions to provide a working conceptualization of a revolution in military affairs.

Claiming that "more is definitely less when it comes to definitions," Colin Gray opts for brevity, defining an RMA "as a radical change in the character or conduct of war."[19] According to Clifford Rogers, "an RMA is simply a revolutionary change in how war is fought."[20] Andrew Krepinevich is slightly less succinct: "What is a military revolution? It is what occurs when the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of conflict. It does so by producing a dramatic increase – often an order of magnitude or greater – in the combat potential and military effectiveness of armed forces."[21] Andrew Marshall, the influential Director of the Office of Net Assessment in the U.S. Department of Defense (for whom Krepinevich once worked) defines an RMA as "a major change in the nature of warfare brought about by the innovative application of new technologies which, combined with dramatic changes in military doctrine and operational and organizational

1999); Robert Citino, *The Quest for Decisive Victory: From Stalemate to Blitzkrieg in Europe, 1899–1940* (Lawrence, KS: University of Kansas Press, 2002); Williamson Murray, "May 1940: Contingency and Frailty of the German RMA," in MacGregor Knox and Williamson Murray, eds., *The Dynamics of Military Revolution, 1300–2050* (Cambridge: Cambridge University Press, 2001), pp. 154–74; and Williamson Murray and Alan Millett, *A War to Be Won: Fighting the Second World War* (Cambridge: Harvard University Press, 2001), especially chapters 2 and 3.

[18] Thomas C. Graves, "Al Qaeda, RMA and the Future of Warfare," U.S. Army War College, Unpublished M.A. Thesis, 2008, p. 5.
[19] Colin Gray, *Another Bloody Century: Future Warfare* (London: Phoenix), p. 105.
[20] Clifford J. Rogers, "'Military Revolutions' and 'Revolutions in Military Affairs': A Historian's Perspective," in Thierry Gongora and Harald von Riekoff, eds., *Toward a Revolution in Military Affairs?* (Westport, CT: Greenwood Press, 2000), p. 22.
[21] Andrew F. Krepinevich, "Cavalry to Computer: The Pattern of Military Revolutions," *The National Interest* (Fall 1994), p. 30.

concepts, fundamentally alters the character and conduct of military operations."[22]

Military historians MacGregor Knox and Williamson Murray adopt a similar definition while drawing a useful distinction between *military revolutions* and *revolutions in military affairs*. Pointing to such examples as the Napoleonic and Industrial revolutions, they conceptualize *military revolutions* broadly as fundamental "upheavals" whose effects extended well beyond the battlefield and military organizations. In addition to the more narrow effects on warfare, military revolutions bring "systemic changes in politics and society. They [are] uncontrollable, unpredictable and unforeseeable.... [they] recast society and the state as well as military organizations." In contrast, Knox and Murray prefer to evaluate contemporary changes in terms of a more modest *revolution in military affairs* entailing "the assembly of a complex mix of tactical, organizational, doctrinal and technological innovations in order to implement a new conceptual approach to warfare or to a specialized sub-branch of warfare."[23] Although revolutions in military affairs are more limited in significance and scope, they may ultimately be subsumed within a larger military revolution. Futurists Heidi and Alvin Toffler, for example, discuss the changes of warfare associated with the information revolution as an integral component of a larger process of social and political change on par with the agricultural revolution, when people ceased being hunter-gatherers to engage in fixed farming and animal husbandry, and the industrial revolution.[24]

Richard Hundley offers a slightly different definition of an RMA as a "paradigm shift in the nature and conduct of military operations that either renders obsolete or irrelevant one or more of the core competencies of a dominant player, creates one or more new core competencies in some major new dimension of warfare, or does both." On first reading this sounds quite different from other definitions, but on closer inspection there is common ground since "core competencies" result from the same combination of technological, doctrinal, and organizational changes that other RMA theorists emphasize. As Hundley explains, "although not all RMAs are technology driven, those that are usually brought about by combinations of technologies rather than by individual ones and involve

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[22] Cited in Thierry Gongora and Harald von Riekoff, eds., *Toward a Revolution in Military Affairs? Defense and Security Policy at the Dawn of the 21st Century* (New York: Greenwood Press, 2000), p. 1.

[23] Knox and Murray, "Thinking about Revolutions in Warfare," pp. 6–7 and 12. Also, Williamson Murray, "Thinking about Revolutions in Military Affairs," *Joint Force Quarterly* (Summer 1997), pp. 69–76.

[24] See Alvin Toffler, *The Third Wave* (New York: Bantam Books, 1984). More focused on the relevance of this thesis for warfare is Alvin and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century* (New York: Little, Brown and Co., 1993), especially pp. 64–81.

essential doctrinal and organizational changes along with new techno-
logies."[25] Hundley's approach is interesting in suggesting that RMAs
may *but need not necessarily* result in fundamental changes in existing
military practices (i.e., core competencies). Existing core competencies
may endure (or even be enhanced) in an RMA consisting largely of fun-
damentally new core competencies in other aspects of warfare. This con-
ceptualization is useful in allowing us to think about an RMA involving
both critical elements of continuity in some dimensions of warfare as well
as revolutionary change in others.

To avoid a point of confusion often evident in discussions of a con-
temporary RMA, it is important to emphasize the distinction between
the *nature* of war, which RMAs do not alter, and the *character* of war,
which they do affect. Colin Gray is emphatic: "Some confused theorists
would have us believe that war can change its nature. Let us stamp out
this nonsense immediately." In the tradition of Clausewitz, Gray notes
that "war is organized violence threatened or waged for political pur-
poses. That is its nature. If the behavior under scrutiny is other than that
just defined, it is not war." The introduction of gunpowder, for example,
did not change the *nature* of warfare but rather the manner in which
it was conducted, its character. Similarly, contemporary RMA theorists
claim that changes in military technology, doctrine, and organization are
changing how wars are fought, not the fact that they remain organized
violence waged for political purposes. The Iraq Wars did not reflect any
change in the nature of warfare. If there was any change, it was in how the
wars were conducted. RMA theorists recognize the distinction between
"war's permanent nature but changing character."[26]

The Contemporary Debate

If we are in the midst of an RMA, what is the nature of the revolution?
What aspects of warfare are being revolutionized? How are the charac-
ter and conduct of warfare changing? Although proponents of an RMA
offer somewhat different answers to these questions, there is a common
intellectual foundation that unites most claims of a contemporary RMA.
The shared assumption is that just as the rise of industrialism in the late
nineteenth and early twentieth centuries profoundly changed the con-
duct of war, so too will the transition from industrial to information-
based economies and societies. Kipp is representative in viewing the
"defining feature of the RMA" as "the shift from mass industrial warfare
to information warfare."[27]

[25] Richard O. Hundley, *Past Revolutions, Future Transformations* (Santa Monica, CA:
RAND, 1999), p. 9.
[26] Gray, *Another Bloody Century*, pp. 30 and 33.
[27] Kipp, "The Labor of Sisyphus," p. 93.

To understand why many saw the 1991 Gulf War as the critical turning point in this transition, imagine video of F-117s attacking targets in downtown Baghdad on the war's first night playing alongside footage of allied bombing raids on Hamburg or Tokyo during World War II. Presented with such a contrast it would be difficult to avoid the conclusion that one was witnessing two very different kinds of warfare. The leveling of German and Japanese cities was in many respects the culmination of industrial era warfare – wildly indiscriminate and massively destructive. Perhaps no one conveys the essence of industrial war better than Bruce Porter. Discussing the relentless killing on the western front during World War I, he observes that:

Even as the essence of the Industrial Revolution was an exponential increase in the productive capacity of the individual laborer, the crux of the machine gun was its multiplication in the killing capacity of the individual soldier. . . . While the machine guns spewed out death at the Somme and Passchendaele, the armaments factories of the Great War spewed out ten thousand standardized items of war material and munitions – all the technological and organizational genius of the industrial age culminating in the mass production of mass destruction.[28]

It was the combination of modern nationalism, industrialism, and technological limitations that produced a form of warfare whose defining characteristic was mass. Nationalism motivated people by the tens of millions; factory assembly lines churned out a seemingly inexhaustible supply of guns, bullets, shells, and bombs; and the inaccuracy of weapons required their use in large numbers to hit and destroy specific targets. The result was modern total war in which entire societies were mobilized, targeted, and nearly destroyed. Implicitly or explicitly, claims of a contemporary RMA see nothing less than the demise of the era of total war and the end of industrialism's "mass production of mass destruction."

Jeffrey Cooper is among those who frame the RMA explicitly in these terms. Explaining that the Napoleonic Revolution began a "150 year period . . . of military expansion with the shift to mass armies, continental or global scope of operations, and dependence on attrition warfare," he suggests that a contemporary RMA "may mark the closing of that era of warfare dominated by large military forces and equally large scopes of military operations. This RMA may usher in a new period of military contraction and a return to wars fought for limited objectives by valuable forces too precious to waste in mass, attrition-style warfare."[29] George and Meredith Friedman echo these themes, predicting that "for the first time in five hundred years, we are about to see a dramatic decrease in

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[28] Porter, *War and the Rise of the State*, pp. 149–50.
[29] Jeffrey R. Cooper, "Another View of the Revolution in Military Affairs," in John Arquilla and David Ronfeldt, eds., *In Athena's Camp: Preparing for Conflict in the Information Age* (Santa Monica, CA: RAND, 1997), pp. 112–13.