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Land Warfare in the Information Age

Robert M. Toguchi

and

Richard J. Rinaldo

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Landpower in the Information Age

by

Robert M. Toguchi and Richard J. Rinaldo

Colonel Robert M. Toguchi is currently serving as Director, Strategic Plans, U.S. Army Training and Doctrine Command. Prior to that assignment, he served first as a Professor of Military Strategy and then as Core Course Director (Nature of War) at the National War College. In earlier assignments he served as a strategic analyst in the Army Staff's Strategy, Plans and Policy Division; War Plans Officer, War Plans Division, Army Staff; and Strategic Planner, 24th Infantry Division; and in other command, staff and academic positions. A 1980 graduate of the United States Military Academy, he later earned a master's degree and a doctorate in history from Duke University. He is also a graduate of the U.S. Army Command and General Staff College.

Richard J. Rinaldo, Lieutenant Colonel, U.S. Army Retired, is currently a Senior Military Analyst with Alion Science and Technology, Inc. He is also a professor at American Military University and a military consultant to the Distance Education and Training Council. Prior to that he served as a Department of the Army civilian at U.S. Army Training and Doctrine Command. Highlights of his active duty career include service as Deputy Public Affairs Officer at U.S. Southern Command, as Assistant Professor of Military Science at Hofstra University, where he taught military history, and as a rifle company commander in Vietnam. A 1963 graduate of Fordham University, he later earned a master's degree and professional diploma in Education from Hofstra University. He is also a graduate of the Infantry Officer Basic and Advanced Courses; Airborne School; Defense Information School; National Defense University, National Security Management; Foreign Service Institute, Latin America Area Studies; and United States Military Academy, History of the Military Art.

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Foreword

This paper uses historical research to develop an alternative framework to consider for characterizing the enduring elements of land warfare. By describing the characteristics of the Algebraic, the Cognitive, and the Moral realms of land warfare, the authors hope to provide a relatively fresh and comprehensive look at land warfare, a frame of reference that can be used for a variety of purposes. The paper then assesses the ongoing changes within the information age as they are perceived to affect each of these elements of land warfare.

The authors refer to several classics very familiar to American students of military art and science, such as the works of Carl von Clausewitz and Antoine Henri Jomini. However, they also discuss the work of T. E. Lawrence, whose unique approaches to land warfare in the deserts of Arabia served the British Army well into the early 20th century. They also shed some light on Thucydides's classic Melian dialogue within *The History of the Peloponnesian War*.

The Algebraic realm addresses mathematical and scientific aspects of warfare, in which the information age has enabled tremendous improvements to be made. In this realm, arguably, the U.S. Army is without peer. The Cognitive realm looks at the wide scope of knowledge and various psychological factors so important to modern warfare, including public opinion and support, an arena of land warfare that requires ever increasing vigilance in the information age. Globalization and its effects are also addressed in this section. Finally, the paper discusses the Moral element of land warfare, which, while more nebulous in definition and activity, is perhaps the central element as it pertains to the Soldier, the centerpiece of land warfare, and to the relationship of the Soldier to the nation.

An important conclusion of the paper is in fact the importance of the Soldier as the ultimate instrument of land warfare. In the final analysis, the Soldier serves as a sensor, leader, motivator and the ultimate carrier of the nation's values and interests on the battlefield.

GORDON R. SULLIVAN
General, United States Army Retired
President, AUSA

September 2004

Land Warfare in the Information Age

Introduction

Change is all around us. Today, it is perhaps unparalleled in terms of the scope, scale and rapidity it has taken in many areas. Change is and has remained a fundamental characteristic of the conduct of land warfare in recent times. The advent of information technologies in the late 20th century has certainly blurred the lines of distinction between the strategic, operational and tactical levels of Land Warfare. It has also truncated the amount of time taken to reconnoiter, gain situational awareness, assess, pass orders and execute even the most complex of tasks. As information continues to pervade our environments in all of its varied dimensions, the question of constancy and relevancy of ground capabilities in the land domain of warfare has been raised.

While many aspects of land warfare are changing, some things remain constant. The following discussion is an attempt to highlight what we consider to be the three enduring elements of land warfare and then to explain how various aspects of the conduct of land warfare are changing within these elements. From our perspective, and arguably, the three primary elements of land warfare are the Algebraic, the Cognitive and the Moral. We will attempt to provide a more comprehensive discussion of these three elements in recent times and then address the impact of the information age on these particular areas.

The Algebraic or scientific, the Cognitive or psychological and the Moral or emotional—these are the driving aspects of land warfare in the information age. In the Algebraic realm, mathematical calculations, such as those used in military road marches, artillery, engineering, communications and logistical factors, are a great strength of a conventional, well-resourced military. In the information age they are enhanced by information technology

Strategy . . . and tactics . . . seemed only points of view from which to ponder the elements of war; the Algebraical element of things, a Biological element of lives, and the Psychological element of ideas.

T. E. Lawrence, *Seven Pillars of Wisdom: A Triumph*¹

(IT), such as Global Positioning Systems, computers and the software that automates them. The Cognitive realm relates to the labyrinth of knowledge involving individual and social psychology, motivation, leadership and psychological operations, which are at constant play during land combat. Finally, there is the Moral, emotional and visceral element—how a Soldier feels or reacts to combat while in military units or while having his or her mettle tested. That element also includes the presence and influence of leaders in battle and in the important preparations for war.

Assuming that these are the enduring elements of warfare, but taking some time to define and discuss them further, are there significant changes in today's information age that affect these three elements, especially where mass communications and other information capabilities

can generate a wide variety of activities and consequences? If so, what are the implications or insights to be gleaned from such a review? Is it possible that information itself has come to dominate land warfare to the exclusion of other factors? Could it be that information is merely the fabric of the tapestry or the soil for the seed? Or could information be one of the imperatives of its age, the missing factor in unifying and describing the nature of land warfare? Could information be, in fact, a principle of war in this new age? If so, what are the new rules or guidelines that emanate from such an insight? Does decentralization become more important than centralization? Is sharing information the key to success in land warfare?

The Algebraic

According to T. E. Lawrence, the Algebraic “seemed a pure science, subject to the laws of mathematics, without humanity. It dealt with known invariables, fixed conditions, space and time, inorganic things like hills and climates and railways, with mankind in type-masses too great for individual variety, with all artificial aids, and the extensions given our faculties by mechanical invention. It was essentially formulable.”² To Lawrence it is the equivalent of the “episteme” or “science” of Ancient Greece. Significantly, as we shall see later, this element contrasts sharply with the biologic element of “doxai,” which refers to “true opinion” and involves action.³ With diligence and time the latter could become science.

Carl von Clausewitz, whom Lawrence admired greatly,⁴ is not silent on this factor of war, devoting an entire chapter to it in *On War*. He addresses fortifications, troop movements, time and space, and geometry as important but not in all cases decisive. On the other hand, he finds them “reflected only faintly in strategy, with its concern for great spans of time and space.”⁵ As modern technology is increasingly overcoming the restraints of time and space, this is certainly one point of *On War* that requires reconsideration, especially for a U.S. military so enamored of operational maneuver from strategic distances and “employment off the ramp.”⁶ Historian Michael Handel goes so far as to propose that today Clausewitz would have to revise his conception of the people, the government, and the commander and army to add technology and the economy.⁷

Antoine Henri Jomini, considered “to share with Clausewitz the position of co-founder of modern military thought,”⁸ disavowed the mathematical and criticized an emphasis on the scientific aspect of war in thinkers such as Adam Heinrich Dietrich von Bülow.⁹ Yet, “betraying the very mathematical tendency which he had criticized . . . [Jomini] regarded the zone of operations as consisting of a field with four sides.”¹⁰ He also dedicated a considerable piece of his treatise on *The Art of War* to logistics.¹¹ In both cases calculability was important, but especially in the latter (though most of the details have been invalidated by modern developments), he leaves a legacy of planning and rationality that survives today in most militaries.

Given Lawrence’s definition of the Algebraic, and notwithstanding Clausewitz’s misgivings about strategy, clearly the ability of the U.S. military today in the Algebraic (read scientific, physical or technological) arena is beyond comparison with other militaries in the world. Scientific and technological change has resulted in “progressively abolished time and distance in war . . . weapons more destructive and precise, and . . . instantaneous collection of ever-greater amounts of information about enemy and friendly forces.”¹² Additionally, the U.S. National Intelligence

Council has delineated even further science and technology improvements for the future.¹³ These will include:

- continuing diffusion of IT and new applications in the biotechnology field;
- integration of IT, biotechnology, materials sciences and nanotechnology, which will generate a dramatic increase in innovation;
- lateral development of technology, i.e., “sidewise” development, such as developing innovative applications for “old” computer chips;
- shortened time between the discovery and the application of scientific advances;
- new IT-enabled devices and services (local-to-global Internet);
- biotechnology (genomic profiling, biomedical engineering, therapy and drug developments, genetic modification, DNA identification);
- materials technology and products that are smart, multifunctional, environmentally compatible, more survivable and customizable;
- nanotechnology,¹⁴ including self-assembled nanomaterials, such as semiconductor “quantum dots,” which could enable rapid processing for drug discovery, blood content analysis, genetic analysis and other biological applications.¹⁵

The United Kingdom’s Ministry of Defence includes a robust paper on the *Science and Technology Dimension* in its *Strategic Trends* project.¹⁶ It describes potential revolutions in information and communications technology, biotechnology and nanotechnology. It also addresses significant evolution in other areas including materials technology, power sources and space science, as well as in particular weapons technologies such as electromagnetic, nonlethal and volumetric weapons (blast, thermobaric, fuel-air explosives).

Will all of this help the U.S. military? Information used in warfare, for example, is causing and will cause significant change to precision, responsiveness, speed and lethality in new and profound ways. IT has caused significant changes in the way wars are fought, especially on land. The trend will likely persist. During the American Civil War, for example, data transfer rates were, on the average, 30 words per minute by telegraph, and nearly 40,000 soldiers were needed to cover 10 square miles of territory. Moving through the next 150 years or so, from telegraph to teletype to computer, during the Gulf War in 1991, 192,000 words per minute were achieved and only 23.4 soldiers were needed to cover the same amount of territory. In 2010, the expected exchange of data is 1.5 trillion words per minute, and only 2.4 soldiers will be needed to cover that same ground.¹⁷

The characteristics of these burgeoning developments involve speed, exponential change, convergence and singularity. Each characteristic is powerful in its own right, but when combined they form a synergistic effect that is in itself a significant trend that will cause magnification and cascading effects. These will, more often than not, lead to striking and disproportionate consequences in land warfare . . . for good or for bad.

Speed is both a characteristic of the pace of scientific and technological development and an attribute of the systems and items developed (artifacts).¹⁸ Speed has always been important in

land warfare, but it will take on added importance in the future to maintain developmental leadership and to execute network-centric operations.¹⁹

Exponential change involves the advance of fields of endeavor by vastly improved orders of magnitude as a result of progress in one field of endeavor that is leveraged to help developments in other fields of endeavor. As one student of this phenomenon tells us, “In the last decade of the 20th century, more technological progress occurred than was experienced in the entire first nine decades of the century. . . . By 2010, technology will have doubled again to become 2,000 times more advanced than in 1900, which means that we will experience the same level of technological change in the first decade of the 21st century that we experienced in all of the 20th century.”²⁰ This phenomenon is especially strong in bioengineering, nanoengineering, robotics and artificial intelligence.

Convergence refers to such phenomena as the Global Information Grid or handheld wireless devices that are at the same time personal digital assistants, radios, televisions, food spoilage and biohazard sensors, voice and data message receivers, cameras, microphones, universal translators and Global Positioning Systems.²¹ Recently announced topographical mapping software, for example, now enables “zooming, seamless scrolling between map segments, distance calculations and route planning. You can add colorful pushpins, jot down notes and circle proposed campsites without ruining the map, and print or export the result as a graphic. If you decide, wisely, to leave your heavy computer at home, you can transfer the finished route (although not the map itself) to a Global Positioning System receiver when you’re ready to sally forth.”²² Singularity seems to be a step beyond convergence, “a merger between human intelligence and machine intelligence.”²³

Of course, even if successful these new trends could pose risks. For example, success could lead to low-cost victory with the result that war could be preferred over diplomacy as a way to solve thorny problems. Also, multinational interoperability might suffer to the degree that willing allies might be physically incapable of keeping pace with U.S. forces. These and other results of success might not be all they could be.²⁴ There could be disruptive and unintended effects, countervailing trends with negative consequences, and continuing uncertainty and ambiguity. The promises of science and technology are often fulfilled in unexpected ways.

Improved mobility and modern communications are examples of “combined impact . . . drastically [decreasing] the time available to make critical decisions even as it intensified the psychological pressures on all levels of decisionmakers.”²⁵ The flood of information now becoming available is literally staggering, offering many opportunities as well for misinformation, disinformation and deception, thus perhaps increasing rather than decreasing the level of uncertainty. There is also a greater potential for information overload without careful efforts to provide for adequate staffing and the filtering of information.

Small scientific or technological changes could also involve disproportional massive effects, though this is not a new case. The stirrup, for example, had a major impact on warfare.²⁶ Similarly the lowly pike supported a Swiss infantry victory over heavy cavalry at the battle of Nancy in 1477, but the successful English infantry tactic of using stakes driven into the ground at the Battle of Agincourt in 1415 to defend against cavalry was thwarted at the Battle of Patay in 1429 by French cavalry maneuver around the flanks.²⁷

Author Barry Watts concludes in his study of friction in war that relative advantage might be obtained by small effects. He states that “it is the *differential* between two sides’ levels of general friction that matters in combat outcomes. If what counts in real war is not the absolute level of friction that either side experiences but the *relative frictional advantage* of one adversary over the other, then the question of using technology to reduce friendly friction to near zero can be seen for what it is: a false issue that diverts attention from the real business of war.” This might seem like a rejection of the Algebraic, if one stresses the fruitlessness of seeking near-zero friction. Yet it affirms that the Algebraic factor is a very important component in the conduct of war, despite limitations of the scientific aspects and the role of nonlinearity. Watts continues, “Even comparatively small frictional advantages can, through nonlinear feedback, have huge consequences for combat outcomes. . . . Moreover, such relative advantages hinge fundamentally on: (1) constraints imposed by human physical and cognitive limits; (2) informational uncertainties and unforeseeable differences stemming from the spatial-temporal dispersion of information in the external environment, military organizations and the brains of individual participants; and, (3) the structural nonlinearity of combat processes.”²⁸

Certainly the United States will continue to have enemies, criminals and others who attempt to exploit our vulnerabilities to achieve relative advantage against us. Some will come at our electronic systems. Others will obtain significant capabilities, especially biological but also chemical, nuclear or radiological because of the diffusion of scientific and technological knowledge. Changes in advanced weapon technology will be available for sale. Privacy and surveillance could become problematic, and the spread of encryption technology could make security more difficult to attain. The situational awareness afforded leaders could undermine initiative in subordinates. Space could become contested as commercial assets become vulnerable to misuse. Expected continuing limits on battery power may constrain the use of communications and data devices. These and many other detrimental aspects of scientific and technological change may potentially challenge the resilience of our nation and our land forces.

The power of mass communication could also be used in new ways such as a network-centric type activity called a “smart mob.” An example is the text messaging that helped mobilize rallies to oust Philippine President Joseph Estrada in 2001.²⁹ Similarly, electronic means may convene groups of people, called “flash mobs,” for a brief period, after which they disband just as quickly.³⁰ One can envision numerous good and bad consequences as a result of connecting and cajoling people through these types of rapid communication capabilities. Moreover, for less sophisticated audiences the Internet has strong credibility, making discrimination between misinformation and disinformation more difficult.³¹

The implications of these trends for Land Warfare in the Algebraic realm might be as follows:

- the imperative of maintaining a technological lead in land warfare;
- the need for orchestration of complexity on a grand scale, especially in innovative uses of new technology;
- the importance and potential benefits of speed in decisionmaking, movement, maneuver and deployment;
- the benefits and pitfalls of convergence in information devices;

- the possibilities of reducing logistics weight by increasing density and mass of capabilities (“nanorizing”);
- the need to anticipate or hedge against disruptive developments (safety, ethics, unintended consequences, adversary efforts), especially instantaneous communications;
- the potential for opposing forces to achieve technological windows of parity;
- the potential for small asymmetries to cause massive effects.

The Cognitive

Considering communications moves us to the Cognitive aspect of war. T. E. Lawrence called it the psychologic element of warfare. Lawrence used this term to refer to “an adjustment of the spirit,”³² equivalent to modern-day social and individual psychology. We use these methods to arrange the minds of men in order of battle. The more precise Algebraic techniques, previously discussed, array the forces physically. The psychologic element applies to the enemy, to our own nation and to neutrals.

General Dwight D. Eisenhower, for example, considered soldier morale “the most highly important of any military attribute,” and it was to be achieved through “intensive training and adequate leadership” from their commanders. He “therefore told his commanders to give constant explanations during field exercises, so that the last private in the ranks could ‘understand the reasons for the exertions he is called to make’.”³³

In recent times much of the Cognitive realm relates to the area of public opinion. Tellingly, in the wake of the Vietnam era, about 1980, a story circulated that the Army might list a 10th principle of war, but the idea was rejected on the grounds of public opinion. Ironically, if the story is true, the reason for rejecting the proposal was at least partial proof of its efficacy—the principle was public support. Reportedly, there was concern lest the American public think the U.S. Army wanted some form of thought control or propaganda as part of its fundamental guidelines for thinking about war.³⁴ Whatever those considerations, General Donn A. Starry wrote about the war principle of simplicity in an article in 1981, stating, “The strategic importance of the principle of simplicity goes well beyond its more traditional tactical application: it is an important element in the development and enhancement of public support. If the American people are to commit their lives and resources to a military operation, they must understand the purpose which is to be achieved. Political and military objectives and operations must, therefore, be presented in clear, concise, understandable terms.”³⁵

The notion of public support or public opinion as a factor in warfare does have significant historical and intellectual background. Clausewitz includes public opinion as one of the centers of gravity against which a nation might have to throw its resources to achieve victory, at least during public uprisings.³⁶ He also thought highly of psychological factors of war, such as the spirit of an army.³⁷ But the importance of public opinion has roots in a much earlier period.

The Greek Thucydides in his famous Melian dialogue tells of the confrontation between Athens and Melos, a small, allegedly neutral island. They negotiate. Both know that Athens is stronger. So the Athenians do not want to mince words or use fine phrases to justify their aggression, nor do they wish to hear Melian arguments about justice. They want to “look facts in the face.”³⁸

The bottom line, they insist, is that “when these matters are discussed by practical people, the standard of justice depends on the equality of power to compete and that in fact the strong do what they have the power to do and the weak accept what they have to accept.”³⁹ Despite Athenian admonishments, the Melian leadership persists in an attempt at dissuasion. This failing, they decide to resist and fight. Later, the island is thoroughly defeated and its inhabitants are taken off as slaves. Public opinion is not yet part of the equation. The strong do what they can, and the weak accept what they must. It becomes the classic axiom of war and politics.

But there is in the dialogue a section long neglected in its implications. The Melians invite the Athenians to negotiate, not before the people of the island but rather only “in front of the governing body and the few.”⁴⁰ The Athenians recognize their tactic. Here is the neglected passage: “So, we are not to speak before the people, no doubt in case the mass of people should hear once and for all and without interruption an argument from us which is both persuasive and incontrovertible and should so be led astray.”⁴¹ Both sides acknowledge the power of public opinion. But the Melian leadership deliberately refuses to provide information to their people, with dire consequences. Can we expect the same in today’s information age when, as John Naisbitt put it in *Megatrends*, “we are dealing with conceptual space connected by electronics”?⁴² Can we expect to hide information in an age where an aggressive media is also involved in helping the general population learn relatively quickly about events, decisions and their possible consequences? The ubiquitous nature of information is a critical aspect of warfare today.

Recent events in Iraq reaffirm the notion that public opinion is a potent force with consequences good or bad for the conduct of military operations, especially on land, where people live and are affected intimately by such operations. As part of the Cognitive domain there will be a premium on the employment of information and psychological operations with great care to avoid directing them, even unwittingly, against the U.S. public or its media. Sensitivity to appropriate disclosure of information within the bounds of operational security will also be important.

The information age has injected new challenges into the Cognitive arena. First, the array of information capabilities available for use of adversaries in prosecuting conflicts now is more robust than ever before in history. The Internet especially has leveled much of the playing field in that regard, and today’s terrorists, for example, can quickly place their message or their mayhem before an international audience. Second, the information age has in fact helped change the shape of the world in today’s version of globalization,⁴³ “the process of growing international activity in many areas that is creating ever-closer ties, enhanced interdependence, and greater opportunity and vulnerability for all.”⁴⁴ Its major driver and uniqueness comes from the revolution in information technology in all its manifestations—the knowledge revolution.⁴⁵ Other features of globalization⁴⁶ include:

- a relatively long-term nature as a process of change, not a static condition;
- a multipronged process manifest in economic, political and diplomatic, military and informational arenas;
- deterritorialization, in which a growing variety of activities take place regardless of the location of the participants;

- interconnectivity across existing geographical and political boundaries;
- speed or velocity of social activity.

Thinkers such as Thomas Friedman have pointed out that “the inexorable integration of markets, nation-states, and technologies to a degree never witnessed before”⁴⁷ has altered the balance of power among nation-states, global markets and individuals. This has allowed some people to become super-empowered, among them angry men like Osama bin Laden and Ayman al-Zawari, who express their rage in bombings and beheadings. Their activities are among the less sanguine aspects of the phenomenon, along with transnational criminality. All are facilitated by porous borders, access to weapons and other technology along with information about them, and dissemination of ideas or images that may foster envy, discontent, hatred or greed. The result is what some call a “bifurcated world order”—those enjoying and those not enjoying the benefits of globalization.⁴⁸

The consequences of globalization are manifold, and for land warfare practitioners they are critical. For example, there is the cascading sensitivity to casualties brought about by globalization and the information revolution—what James N. Rosenau calls a “cathectic” capacity of individuals to “attach emotions to issues and care about a preferred solution.”⁴⁹

Evidence of sensitivity to human suffering and civilian casualties may be found in the numerous peace operations and humanitarian efforts of the United States and others during the last decade of the 20th century, in which restraint and rules of engagement (ROE) have played such important roles. Indeed, the principle of restraint remains a principle of military operations other than war in joint doctrine.⁵⁰ Recently U.S. forces in Iraq began to receive nonlethal capabilities to give them an option to confront ROE dilemmas with less than deadly force.⁵¹

In the past the Army and its doctrine writers have gone so far as to entertain the notion of restraint as an aspect of economy of force in a set of “principles of military operations.” These would replace the “principles of war.”⁵² Clearly, restraint contributes to post-conflict peace building by preserving infrastructure and fostering good will among civilian publics.

As one analyst put it, “If battles in Iraq are a foretaste of wars of the 21st century, the tactical fights will be more intensely personal . . . and the *political constraints more restrictive* [our italics].”⁵³ Moreover, the Army includes civilians as one of the major factors considered during mission analysis—METT-TC (mission, enemy, terrain and weather, troops and support available, time available, civil considerations).⁵⁴ Dealing with such circumstances will be hard work and will involve the “inherent messiness and slowness.”⁵⁵

An equally significant consequence of globalization for military operations is a blurring of the strategic, operational and tactical levels of war as well as types, places and phases of operations, to include the U.S. homeland. Concerning the levels of war, one land warfare publication informs us that they “may compress so that there is significant overlap. . . . Especially in . . . a military operation other than war, a single commander may operate at two or even three levels simultaneously. . . . In a military operation other than war, even a small-unit leader, for example, may find that ‘tactical’ actions have direct strategic implications.”⁵⁶ The association of levels of war with particular levels of command is in fact becoming less rigid as networked military or

even personal information systems such as digital cameras proliferate, and as political sensitivity to even small military engagements or activities increases. (An example is the case of Abu Ghraib prison in Iraq, when the disclosure of digital photographs of prisoner abuses prompted a series of internationally publicized investigations.⁵⁷) On the other hand, the kind of brutal activities evidenced by beheading or bombing innocent civilians will also receive widespread international attention and—hopefully—opprobrium.

There is also a growing convergence of military challenges once associated with distinctly different kinds of contingencies. Formerly the challenges associated with conducting conventional military campaigns against modern, industrial-age armed forces were easily distinguishable from those associated with defeating an unconventional threat. They were also distinguishable from military support of civil activities such as disaster relief, internal security and counterterrorism. Those distinctions increasingly are eroding, as weaponry and knowledge become increasingly diffuse. As recent events have shown, even low-intensity requirements may escalate at any time and with little warning into outright hostilities against enemies whose growing access to advanced technology may allow them to threaten even conventional armed forces.

Meanwhile, as nontraditional forces and capabilities proliferate, and as legal and moral restraints on the use of force surrender to communal, religious or ideologically driven absolutism, clear separations between conventional and unconventional conflicts are fading. Any future major conflict is almost certain to see a routine commingling of such operations. The conflict in Iraq is a good example. But American military history documents many other cases of the blurring of the phases of operations between pre-conflict, conflict and post-conflict periods. Forces involved have seamlessly conducted and will continue to conduct, sequentially or concurrently, a variety of operations such as offensive, defensive, stability and support operations. Peacetime military engagement activities, if past history and current practice are any guide, will also continue to be important.⁵⁸

We are very good in the Army in developing single-event people. If we were a track team, we'd have the best 100-yard-dash people, the best milers and the best discus throwers. But what we really need to be making right now are decathletes that are just good enough at everything.

General Peter J. Schoomaker, Army Chief of Staff⁵⁹

Because of this convergence of requirements, it makes little sense to design specialized military forces to deal uniquely with one aspect of the conflict spectrum or another. Even in small-scale contingencies, the requirements for firepower, mobility and protection are growing, while it is increasingly unlikely that any major conflict would transpire without concurrent unconventional and civil support and security challenges. As stated recently in regard to plans to optimize some units only for stability operations, “A security force works because of its capacity to inflict violence. It is that threat of force that makes it credible.”⁶⁰ That notion underlies the unofficial motto of United Nations peacekeepers: “Peacekeeping is not a job for soldiers, but only a soldier can do it.”⁶¹

An extension of that thinking is the recognition that force alone may be a farce because “Military force is not relegated to violence alone; it encompasses a synergy produced by logic [such as economic incentives or diplomatic engagement] and violence . . . most effective when the certain, overwhelming potential of our military capability imposes an irrefutable logic upon our opponent, whereby he acquiesces to our demands.”⁶²

Even more significant is the centrality of ideas in today’s conflicts, ideas leveraged by the information age in all its manifestations. As *The Preamble to The Constitution of the United Nations Educational, Scientific and Cultural Organization* points out, “wars begin in the minds of men.”⁶³

Accordingly, the emerging operational environment will place a premium on full-spectrum forces with special-purpose capabilities designed for success in any type of operation while optimized for major combat operations. Such forces must be able to operate effectively anywhere on the spectrum of conflict without substantial augmentation. They must also satisfy diverse requirements within a single campaign. Likewise, these forces and leaders must be capable of simultaneously conducting warfighting and stability operations and transitioning smoothly from one category of mission to the other and back again without any loss of momentum or operational focus.

This is not simply a fight against terror—terror is a tactic. This is not simply a fight against al Qaeda, its affiliates and adherents—they are foot soldiers. This is not simply a fight to bring democracy to the Middle East—that is a strategic objective. This is a fight for the very ideas at the foundation of our society, the way of life those ideas enable, and the freedoms we enjoy.

Les Brownlee, Acting Secretary of the Army, and
General Peter J. Schoomaker, Army Chief of Staff⁶⁴

Finally, in the Cognitive realm, there is another aspect of the logic of conflict discussed earlier. It lies in the choice of peoples to be part of the global community, to embrace modernity with all its warts to secure the blessings of liberty and economic prosperity enjoyed by the democracies and its allies. Alternatively, there is the choice to employ violence to gain one’s ends.

The following are selected implications, imperatives and lessons for land warfare closely related to the Cognitive realm:⁶⁵

- the need for competence in influence operations, urban warfare, guerilla warfare, transitions, postconflict activities and conflict termination in a bifurcated world;
- the difficulty of reconciling a “Great Crusade” approach to operations with “Small Wars and Skirmishes”;⁶⁶
- the recognition of the potential for individual actions to cascade quickly into colossal effects;
- the probability and consequences of military actions, such as collateral damage, refugees, displaced persons, disease, starvation and the like, which could easily impact beyond the immediate field of combat;

- the need for adaptability and creativity in a complex, nonlinear, media-rich world with complex emergencies and adverse or embarrassing incidents of all types that will occur periodically;
- the importance of recognizing the roles and equities of other instruments of national and international power and the willingness and flexibility to work with them;
- the complexity of generating, employing and sustaining appropriate forces to include low-density/high-demand units such as military police, construction engineers and civil affairs;
- the imperative of multinational, interagency organization and effectiveness;
- the need for full-spectrum capabilities of an expeditionary nature.

The Moral

The most striking element of warfare in T. E. Lawrence’s epistemology was the Moral element. He conceived it as a “Biological element of Lives, the components of which are variable, sensitive, and illogical—the ‘felt element’ of troops—which especially involves the use of reserves against the possibility of accident.”⁶⁷ This was the Ancient Greeks’ “doxai” or “true opinion,” which with practice could become “episteme” or “science.”

A good example of the Moral element might be the kind of warrior instinct embodied in actions on the second day of the Battle of Gettysburg, when a lone northern regiment defended Little Round Top. Outnumbered, with ammunition running low and one-third of his troops killed or wounded, the Colonel of the Regiment, Joshua Chamberlain, ordered the bayonet charge, thus changing the outcome of the Civil War and earning him the Medal of Honor.⁶⁸

The interplay of confusion and calculation does present to the student of battle a nightmare of untidiness. Clausewitz and many others emphasize the “imponderables, that were seen as no less influential than the rational and calculable elements.”⁶⁹ A member of Sykes’ Fifth Corps in the Battle of Gettysburg would later lament the lack of “definite information or knowledge respecting the method or ‘Art of Fighting,’ or sudden unlooked for conditions arising . . . after the plan had, according to well-known principles governing such a plan, or the tactical formations and maneuvers, been worked out.”⁷⁰

It is remarkable how many people exert themselves and go through contortions to prove that battles and wars are won by any means except by . . . fighting.

Cyril Falls, in *A Hundred Years of War*⁷¹

From Gettysburg to Operation Iraqi Freedom, the situation is similar. In the latter, an official Army report notes, “No one anticipated or estimated the intentions of the paramilitary accurately . . . the ability of the Iraqis to hide with some success from the incredible array of technical intelligence available to the coalition may give pause to those advocating that U.S. forces will be able to develop the situation out of contact and attack from standoff distances.” So, “most tactical commanders,” noted the report, “claimed that they made every assault as a movement to contact.”⁷²

Dennis Hart Mahan, teacher of American Civil War generals, perhaps best highlights the issue. He notes that the general would need all the “divine endowment . . . he could muster,” to master the situation where “in almost every case the data on which the solution depends are wanting, or of such a character as to tender it very complicated or even indeterminate.”⁷³ There is little doubt, nevertheless, that there is something, however ill-defined it may be, that cuts through the morass of this “fog of war.” Perhaps it is Napoleon’s power of “coup d’oeil.”⁷⁴

Then Major George S. Patton, Jr. once stated, “Above armed hosts there hovers an impalpable something which on occasion so dominates the material as to induce victory under circumstances quite inexplicable. . . . The secret lies in the inspiring spirit which lifted weary, footsore men out of themselves . . . the warrior soul.”⁷⁵ Clausewitz mentions such qualities: “[F]irst, an intellect that, even in the darkest hour retains some glimmerings of the inner light, which leads to truth; and second, the courage to follow this faint light, wherever it may lead [original emphasis].”⁷⁶ Or perhaps “the essential character . . . can only be grasped when we examine the supreme effort of the troops, the unwavering courage and devotion of the plain soldiers.”⁷⁷

Our adversaries in the Global War on Terrorism are not without some form of courage and devotion. However, their motivation and moral lever seem to be of the kind in which many of them do not use terror to achieve political objectives by influencing public opinion to change a system. Instead they seek an apocalyptic destruction of an evil enemy who is viewed as the antithesis of their way of life, religion or goals. They may seek revenge, retaliation or destruction for its own sake in colossal acts of spite, hate, rage and hostility. Many of the people labeled as today’s “terrorists” may not even be “terrorists” in the strictest sense of the term. They do not seek to create terror. Instead, they look upon themselves as soldiers using terrorist-type tactics to destroy an enemy.⁷⁸

To defeat such an adversary will require more than an army. As evidenced in places like Iraq and Afghanistan, the people, the government and the military must be unified in the struggle for victory. The military, especially the soldier, is an indispensable element in that equation, as evidenced in the precise, solemn and awe-inspiring pageantry and ritual following the death of an American President. In this ritual may be found expression of the unity of a nation in its common experience and purpose, a trinity that binds the nation: the government, the military and the people. The caisson moves forward toward the U.S. Capitol carrying the President’s casket, draped in our flag and accompanied by an honor guard from the armed forces of the United States. The honor guard’s bearing and precision are imposing, their dress immaculate and their accoutrements impressive in style and tradition. As such they honor their profession, its purpose and its history before the on-looking crowds who line the street in support and grief for the President, his family and heirs.

Behind the caisson comes the riderless horse with boots facing backward toward the rest of the entourage. The ghost of the fallen leader looks behind him to those who follow, and the first among them are the cadets and midshipmen of our service academies, with the Army’s West Point leading because it was founded first. These fledgling officers and their charges will come forward with public support to preserve and defend the state and its new leaders, to assure its continuity.

At the Capitol the President lies in state. An honor guard is there also, solemnly still and alert. When the guard changes, the movements are measured, dignified and deliberate. The people pass respectfully to honor the fallen leader. In so doing they not only pay homage but also actually participate in a ritual of statehood and its power.

In these activities commemorating the death an American President lies a reaffirmation of the enduring presence and process of that trinity. Clausewitz discusses these factors in *On War*, and they are central to the conduct of war. He says, “The passions that are to be kindled in war must already be inherent in the people; the scope which the play of courage and talent will enjoy in the realm of probability and chance depends on the particular character of the commander and the army: but the political aims are the business of the government alone.”⁷⁹ In this ceremony and from a Clausewitzian perspective, the American concept of civilian control of the military is affirmed, while generating public support for a war is at least implied as a *sine qua non* of any military effort.

The following are some of the implications related to the Moral domain:

- maintenance of moral capital through recruitment, training and education for leaders and soldiers, and self-development programs involving ethics, courage (physical and moral), rules of engagement, cultural sensitivity and the law of war;
- a warrior focus in doctrine, organizations, training, material, leadership and education, personnel, facilities and overall capabilities;
- technical and tactical excellence for the purpose of mission performance as well as for protecting other soldiers, their units and our homeland;
- attention to the homeland for moral support;
- attention to the strategic aims of operations as determined by political authorities.

The American Soldier

This paper has examined each of the enduring elements of land warfare and has described some of the implications of change emanating from the information age of the late 20th century. Clearly, the most important of these is that operating within the mechanisms of the Algebraic, the Cognitive and the Moral realms of warfare, the soldier is and will remain the centerpiece for the Army and for forces operating within the land domain. The interplay of these three realms involves great complexity, far beyond what individual platforms or mechanisms can confront or resolve. In the crucible of war, the soldier remains the pivotal point of courageous and moral action, which resolves conflict. As Clausewitz put it, “One might say that the physical seems little more than the wooden hilt, while the Moral factors are the precious metal, the real weapon, the finely-honed blade.”⁸⁰ Flexible, adaptive and competent soldiers, infused with the Army’s Warrior Culture, will be organized, trained and equipped to fight wars and win the peace.

Every soldier, imbued with a warrior ethos and spirit and undergoing the most demanding training available, will be a warrior first because on the battlefields of today and tomorrow there are no rear areas or front lines, and the homeland is no longer safe between two oceans. All

soldiers, therefore, must be able to defend themselves and the nation. They will embody the ethos of a warrior in an inclusive, not exclusive, moral culture. They will be the ultimate sensors and the most precise weapons known to mankind, overcoming the fog and friction of war through endurance, determination, courage and competence. The practice of land warfare for the U.S. military will require that the Army transform “with the understanding that people are always more important than hardware and quality is more important than quantity. Because of this, The Army focuses its efforts on leading, training, equipping, and supporting soldiers with the best the nation can provide.”⁸¹

Endnotes

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- ³ See Joseph Owens, C.Ss.R, *A History of Ancient Western Philosophy* (New York: Appleton Century Crofts, Inc., 1959), pp. 82, 205, for a discussion of “episteme” and “doxai.”
- ⁴ English, “Kindergarten Soldier,” p. 8.
- ⁵ Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), Book III, Chapter 15, p. 214.
- ⁶ See, for example, *On Point: The United States Army in Operation Iraqi Freedom*, Chapter 7, accessible from <http://onpoint.leavenworth.army.mil>.
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- ¹⁰ *Ibid.*, p. 87.
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- Another excellent compilation of science and technology trends is John Matsumura, Randall Steer, John Gordon IV and Paul Steinberg, *Preparing for Future Warfare with Advanced Technologies: Prioritizing the Next Generation of Capabilities* (Santa Monica, Calif.: Rand Arroyo Center, 2002). This paper posits a new equation for success in warfare where “success=accomplishment of objectives, given that friendly losses are kept to a minimum and noncombatant casualties and collateral damage are acceptable” (p. 5). See also The United States Commission on National Security/21st Century, *New World Coming: American Security in the 21st Century, Supporting Research and Analysis*, 15 September 1999, pp. 6–12, 120–122, 138.
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- ¹⁶ *Strategic Trends* addresses both the business of science and technology, potential technology revolutions and other evolutionary major technologies.
- ¹⁷ Richard J. Newman, “Warfare 2020,” *U.S. News & World Report*, August 5, 1996.
- ¹⁸ Anderson et al., in *The Global Course of the Information Revolution*, distinguishes between technology as the idea and artifact as the product (p. x).
- ¹⁹ See Richard Hart Sinnreich, “Make Information Technology Friend Rather than Foe,” *ARMY*, March 2003, p. 8. See also James Gleick, *Faster: The Acceleration of Just About Everything* (New York: Pantheon Books, 1999). See also Vice Admiral Arthur K. Cebrowski, U.S. Navy, and John J. Garstka for the seminal “Network-Centric Warfare: Its Origin and Future,” Naval Institute *Proceedings*, January 1998.
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- ²² David Pogue, “Scaling the Heights, With a Disc as Sherpa,” *The New York Times*, June 24, 2004, <http://www.nytimes.com/2004/06/24/technology/circuits24stat.html?ex=1403409600&en=2fb708c85df0b4ba&ei=5007&partner=USERLAND>.
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- ²⁴ See Hans Binnendijk, “Introduction,” in Hans Binnendijk, ed., *Transforming America’s Military* (Washington, D.C.: National Defense University Press, 2002).
- ²⁵ Michael Handel, *War, Strategy and Intelligence* (London: Frank Cass and Company Limited, 1989), pp. 20–21. Handel also writes extensively about such topics in “Clausewitz in the Age of Technology,” in Michael Handel, ed., *Clausewitz and Modern Strategy* (London: Frank Cass and Company, 1986).
- ²⁶ See Lynn Townsend White, Jr. *Medieval Technology and Social Change* (Oxford: Oxford University Press, 1962). See also Edward Rothstein, “The Unforeseen Disruption of Moving Ahead,” *The New York Times Online*, December 22, 2001.

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- ³⁶ Clausewitz, *On War*, p. 596.
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- ⁴⁵ *Ibid.*, p. 8. See also Frost, in *Global Century*, where she says, “The major driver of globalization is the knowledge revolution,” p. 43.
- ⁴⁶ See William Scheuerman, “Globalization,” in Edward N. Zalta, ed., *The Stanford Encyclopedia of Philosophy* (Fall 2002 Edition), <http://plato.stanford.edu/archives/fall2002/entries/globalization/>. See also Flanagan, Kugler and Frost, *Global Century*, pp. 8–13.
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- ⁴⁸ Flanagan, Kugler and Frost, *Global Century*, p. 14.
- ⁴⁹ James N. Rosenau, *Turbulence in World Politics: A Theory of Change and Continuity* (Princeton, N.J.: Princeton University Press, 1991), p. 239.
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- ⁶⁷ Lawrence, *Seven Pillars*, p. 192.
- ⁶⁸ See Army Field Manual (FM) 22-100, *Leadership* (Washington, D.C.: Department of the Army) for a description of this action.
- ⁶⁹ See, for example, Clausewitz, “Friction,” *On War*, Book I, Chapter 7.
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- ⁷⁸ See, for example, Ralph Peters, *Beyond Terror* (Mechanicsburg, Pa.: Stackpole Books, 2002), John Arquilla and David Ronfeldt, eds., *Networks and Netwars: The Future of Terror, Crime, and Militancy* (Santa Clara, Calif.: Rand, 2001) and Ian O. Lesser, Bruce Hoffman, John Arquilla, David F. Ronfeldt, Michele Zanini and Brian Michael Jenkins, *Countering the New Terrorism* (Santa Clara, Calif.: Rand, 1999).
- ⁷⁹ Clausewitz, *On War*, p. 89. Actually, Clausewitz’s trinity included violence, genius and policy, while the government, the people and the commander and his army were part of the employment of violence. Edward J. Villacres and Christopher Bassford in “Reclaiming The Clausewitzian Trinity,” *Parameters* (Carlisle, Pa.: U.S. Army War College, Autumn 1995), note that the “definition of the trinity as ‘people, army, and government’ seems to have originated in Harry Summers’s important and influential study, *On Strategy: A Critical Analysis of the Vietnam War* [Novato, Calif.: Presidio Press, 1982].” What is important is that Clausewitz recognized the importance of each in the conduct of a war.
- ⁸⁰ Clausewitz, *On War*, p. 185.
- ⁸¹ *United States Army Transformation Roadmap 2004* (Washington, D.C.: Department of the Army, TBP), p. 5-1.