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**Creating Combat Power
for the 21st Century**

James M. Dubik

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for the 21st Century**

by

James M. Dubik

**The Institute of Land Warfare
ASSOCIATION OF THE UNITED STATES ARMY**

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LAND WARFARE PAPER NO. 25, OCTOBER 1996

Creating Combat Power for the 21st Century

by Colonel (P) James M. Dubik, USA

Colonel Dubik graduated from Gannon University with a BA in philosophy. He was commissioned as a Distinguished Military Graduate into the United States Army. Colonel Dubik earned his Master's degree in philosophy from Johns Hopkins University. He taught philosophy at the United States Military Academy at West Point, New York and later received a Master's degree in Military Arts and Sciences during an Advanced Operational Studies Fellowship at the School of Advanced Military Studies, Fort Leavenworth, Kansas. Colonel Dubik concurrently served as a Special Assistant to the Chief of Staff, United States Army and held a Fellowship at the Massachusetts Institute of Technology Center for International Studies. He commanded U.S. and multinational forces in northern Haiti during Operation Uphold Democracy. He is currently serving as Executive Officer to the Chief of Staff, United States Army.

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FOREWORD

As important and necessary as it is, technology alone does not equal combat power — not in the past, not now, and not in the 21st century. Rather, combat power results from the proper mix of technology, doctrine, soldiers and organizations, leadership and training.

In developing this idea, the author describes the thrust of the current Army XXI process — gathering, processing and using information in deciding and acting, recommending areas in which technology could have a high payoff. He then examines each of the other components of combat power and asks specific questions concerning the overall direction of Army XXI.

Some of the questions include: Can we continue to attract and retain the quality soldiers and leaders Army XXI needs in the numbers and specialties required? Have we identified what the “quality criteria” are for Army XXI with sufficient specificity to use them in recruiting and retention? Are we including in our officer and NCO education programs the technical skills needed by leaders of Army XXI? Do our schools and training experiences do all that they can to prepare leaders to think? How will Army XXI alter leadership skills? How can we increase the experience base of leaders when their time assigned to operational units is lessening?

The value of this thought-provoking paper lies in the fact that it highlights many issue areas that will have to be resolved for the information-age Army to be effective in the 21st century.



JACK N. MERRITT
General, U.S. Army Retired
President

October 1996

Creating Combat Power for the 21st Century

We are standing at the beginning of something really big: the emergence of the information age and all that it implies — socially, economically, politically, internationally and militarily. Snatching the opportunities that are before us, unfortunately, is very difficult, for we must do so amid reductions in budget and force structure and three-fold increases in operational requirements. Near-term requirements, important as they are, may cloud one of our most essential tasks — to grow the Army of the 21st century. What is ours if we are able to take it is this: to increase the tempo, lethality and survivability of our force beyond that of any potential adversary — thus assuring that our Army remains the best on the face of the earth, that no “peer-competitor” arises, and that we continue to contribute to maintaining a period of stability in which our nation and her economy can grow and prosper.

We are already moving out smartly toward this goal. Started by the Louisiana Maneuvers process, continued through the Advanced Warfighting Experiments and the Force XXI process, and completed in Army XXI, the Army is changing to meet the requirements of the information age. We want to get it right, and we will.

So far the main effort has been on identifying the right set of technologies so that when we do spend the limited acquisition dollars that we have, we spend them wisely. Own-the-night technologies to turn night into day; computer hardware and software to speed decisionmaking; automatic digital-position update systems to improve battle tracking; integrative technologies linking digitally the intelligence, maneuver, aviation, air defense, engineer, logistics, and command and control systems to create both increased situational awareness and a faster decision-to-action cycle — all have been tested and are being refined. In one form or another each of these sets of technologies will become part of our Army. Technology by itself, however necessary, is insufficient to increase the combat power of America’s power projection Army.

One needs only to read *Technology and War* by Martin van Creveld to understand that increases in combat power result from the correct balance of technology, doctrine, soldiers and organizations, leadership and training.¹ Furthermore, by reading the first chapter of *Certain Victory*, one quickly sees that the transformation of the post-Vietnam Army into that which won in Panama and the Gulf, succeeded under complex and ambiguous conditions in Somalia and Haiti, and is now deployed under similar conditions in Bosnia was not the result of technology alone.² Certainly the Abrams tank, Bradley fighting vehicle, Apache and Black Hawk helicopters and Patriot missile system played a big part. An equally important part, however, was played by the following changes: the “reinvention” of Recruiting Command and the NCO Education System (NCOES); the

emergence of airland battle doctrine; the training “revolution” consisting of performance-oriented training, the Combined Arms Training Centers and the Battle Command Training Programs (BCTP); and training doctrine contained in Army Field Manuals (FMs) 25-100, *Training the Force*, and 25-101, *Battle Focused Training*.

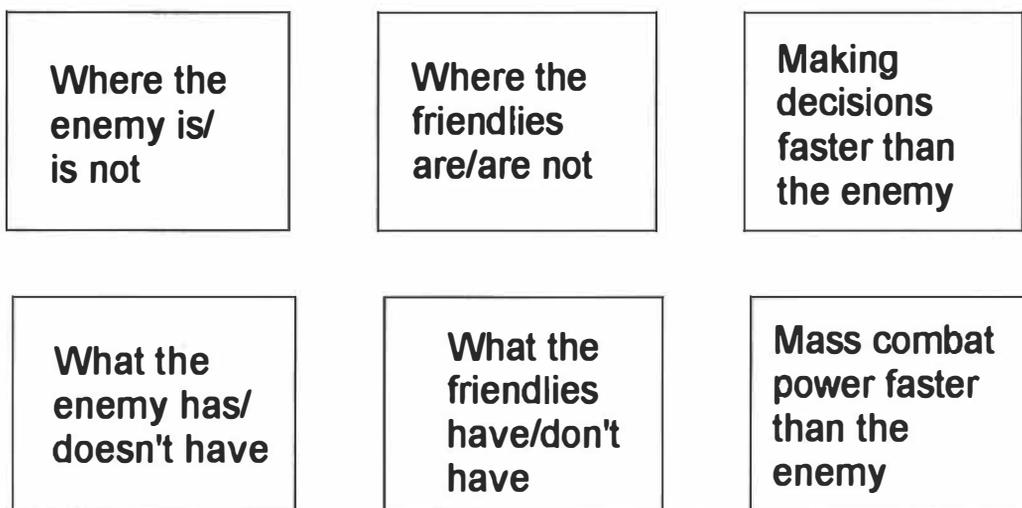
We are giving due attention to the set of technologies that will help keep Army XXI more lethal than any other force on the planet. As we had done before, we must also give equal due to the other components of combat power. U.S. Army Training and Doctrine Command (TRADOC) Pamphlet (PAM) 525-5, *Army XXI Operations*,³ *Decisive Victory: America’s Power Projection Army*,⁴ and *Envisioning Future Warfare*⁵ — each provides a description of the conditions of future warfare and attempts to derive future requirements. The purpose of this essay is to continue the investigation of the future by suggesting some areas in which all the elements of combat power — technology, doctrine, soldiers and organizations, leadership and training — could be made consistent with one another.

Technology

The crux of the Army XXI process concerns information — its gathering, processing, and use in deciding and acting. To that end, we have focused on a set of technologies that will integrate the battlefield operating systems. The idea is that such integration will produce “situational awareness,” as depicted in figure 1.

Figure 1.

SITUATIONAL AWARENESS



The four blocks on the left concern information about enemy and friendly forces: their locations, their equipment and their order of battle. The two blocks on the right concern the use of information: top right, use in planning and directing — making decisions and issuing instructions; bottom right, use in execution — massing the effects of combat power and tracking the battle. Accurate, timely and accessible information concerning terrain (digital maps), weather (digital forecasts and models), and light data provides background important in each area of situational awareness. This kind of awareness will never approach “perfect intelligence.” But commanders will benefit from a quantum improvement in what they know about their enemy and their own unit and in their ability to decide and act faster than their enemy. Albeit not eliminated, the “fog of war” will have been reduced.

Observers, whether human or technical, will be linked digitally to deciders and fire delivery platforms — air, ground and sea. The result: commanders who will have the capability to make the right decision and take precise action at the decisive point faster than any potential enemy. This capability has the potential to change the conduct of war, a potential that will be realized once the right set of technologies is fielded:

- user-friendly, fully integrative software linking all of the battle operating system’s programs and common data bases;
- a functional, battlefield-capable digital network;
- software that replicates and speeds staffs and commanders through the military decisionmaking process and facilitates distribution of products so as to enhance parallel planning;
- reliable digital links among the variety of sensors and complete array of maneuver and fire delivery platforms; and
- a digital way to track friendly units as well as locate enemy units.

Further, this set of capabilities will be applicable to all forms of warfare, from that of the Gulf War, to Panama, to Haiti, to Bosnia. All of this is doable, but not easily done. It requires reducing combat, one of the most complex areas of human endeavor, to digital traffic. These are world-class problems that will require world-class solutions.

When the process is complete, it will yield a military force more capable than any other it confronts. This kind of force will fight differently from the one we now have. Exactly how differently is yet unknown, but this “information-age” Army will be as different from its industrial-age forerunner as the industrial-age force was from its agrarian predecessor. The conduct of warfare will change; doctrine must capture this change.

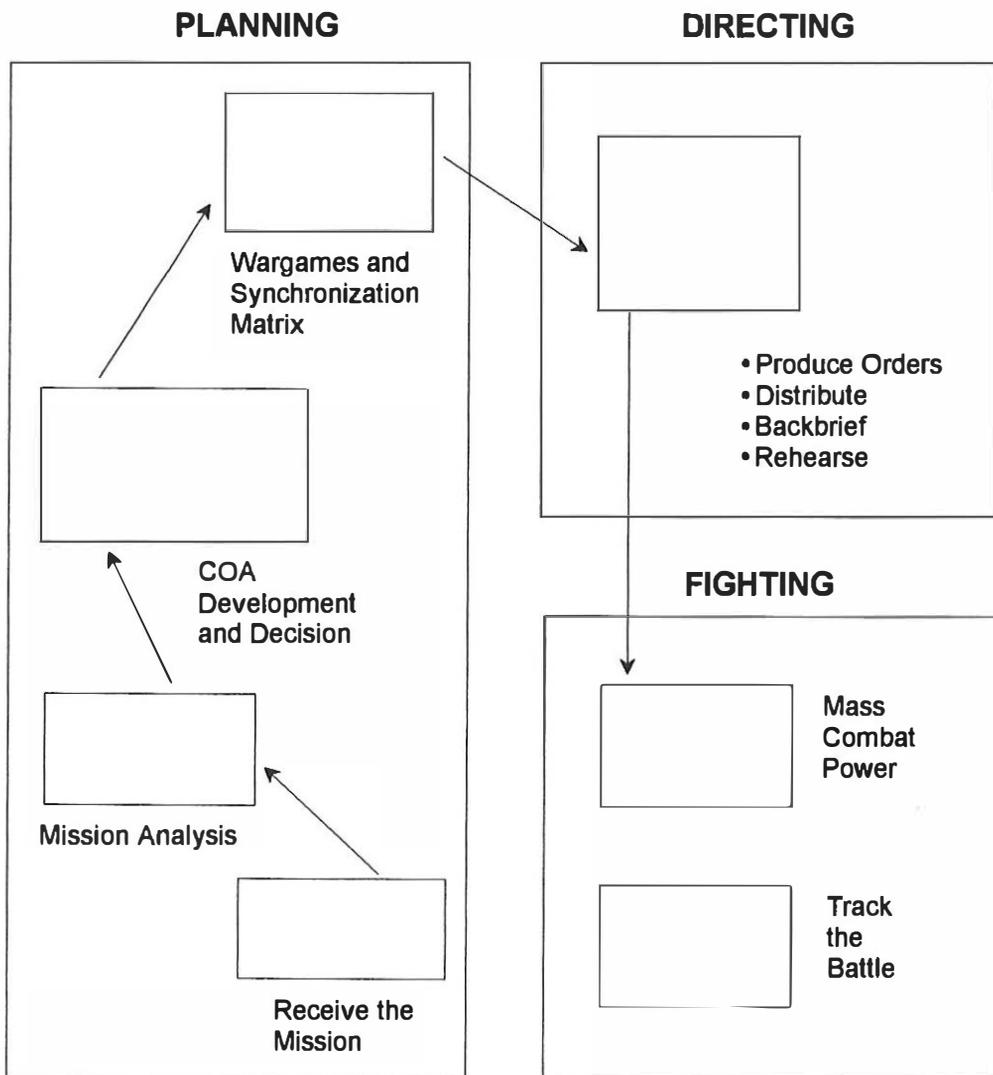
Doctrine

TRADOC PAM 525-5, *Army XXI Operations; Decisive Victory*; and *Envisioning Future Warfare* — each attempts to capture this change. But these are just sketches, concepts. Doctrine is more detailed. We — doctrine writers and the rest of us — face difficult challenges.

1. How will the military decisionmaking process and the associated staff officer duties change?

Our future FM 101-5, *Staff Organization and Operations*, must address this question. Digitization will affect almost every step of the process depicted in figure 2.

Figure 2.



Information in our intelligence data base — when coupled with information about terrain, weather and light, in addition to the digital maps currently available — will automate much of the intelligence preparation of the battlefield process and many of its products. Initial mission analysis and listing of specified tasks could be done by an “expert” reading function. Identification of alternative courses of action and the analysis of these alternatives will change drastically when we combine the friendly force data base with a Janus-like war-gaming function and use “expert systems” or artificial intelligence to assist. “Freezing” the war game of the course of action finally selected by the commander will automatically produce a synchronization matrix. Warning orders, operations orders, fragmentary orders, situation reports and graphics will be distributed via digital transmission throughout the friendly unit. This kind of parallel planning will be faster and better than any yet experienced because of shared data bases and a digital communication network. Our 1/3 - 2/3s (or 1/5 - 4/5s) rule⁶ will quickly become outdated. Commanders will be able to assemble at any location capable of receiving digital traffic to conduct their backbriefs and rehearsals.

Activity in tactical operations centers (TOCs) will also change. Much of TOC operations involves collecting reports, posting and distributing information, and updating subordinate and higher headquarters. These are just the kinds of routines that one can reduce to computer tasks. A force whose target acquisition platforms — whether Air Force, Army aviation, unmanned aerial vehicle (UAV), ground vehicle, sensors or individual soldier — are linked directly and digitally to fire delivery and maneuver platforms — again of whatever service — will mass combat power and track its forces differently from those devoid of those capabilities. Certainly commanders and their staffs will remain in this loop. No completely “automatic” sensor-to-shooter link is likely to be satisfactory. Equally certain, however, is this: Commanders of forces with these capabilities will plan, direct and fight their forces drastically differently from the way we do now.

The claim here is **not** that each and every way we now plan, direct and fight will change. Rather, the claim is more modest: It is only that enough will change in each of the areas of planning, directing and fighting that our current doctrine will be outmoded. We must start working these doctrinal changes now. Without a doubt, at the very least some of how intelligence officers, operations officers, fire support officers, air defense officers, engineers, support operations officers, executive officers, chiefs of staff and others perform their duties will change. Functional staff officers may still be required, but what they do and how they do it will change. Doctrine must capture these changes.

2. What can and should be digitized, what should not, and how should we fit the two categories together?

Some steps along the military decisionmaking path will be less automated than others; some will not be digitized at all. Furthermore, doctrine must also capture what should not change: the requirement for face-to-face leadership, backbriefs and rehearsals,

voice coordination and exchange of liaison officers, and clearance of fires procedures — i.e., the human dimension of our profession.

Related is the perennial concern over “micromanagement.” Of course, the only correct solution to the issue of supervision will depend upon a particular situation, but the concern is raised legitimately because the power of the computer can allow the most senior of commanders to “see” almost to the individual level — and the temptation to control what one sees is very strong. Future doctrine will have to deal with these problems. In addition, it will have to define “operating within the intent of the commander” in the information age.

Doctrine must address not only what **can** be digitized, but also what **should** be digitized. The two are separate issues, each worthy of complete study.

3. Who should have access to which data bases?

The common data base — consisting of intelligence data, logistics data, data concerning information about friendly force locations and status, fire support data — will help create the common picture of the battlefield central to situational awareness, **if** the right headquarters have access to the information and **if** we present that information in a useful way.

Subordinate unit access to centralized data bases can assist in decentralizing decisionmaking, assist in parallel planning, and speed the decision-to-action cycle.⁷ Our future doctrine will have to address how we intend to control access. On one hand, centralized access seems counter to the whole direction in which information-age technologies and processes are headed. Open access will not create information deluge at lower levels, for they will get only that information that they ask for. Information deluge occurs when the higher headquarters “dumps” unusable or unnecessary information on the subordinate. On the other hand, completely decentralized access could have undesirable security implications.

Simple and useful display of information is just as important as access. One of the difficulties in an Army XXI unit’s TOC will be the vast amount of information available. Not only will this make identification of the commander’s critical information requirements, priority intelligence requirements, routine unit status information, and the other kinds of information needed to make decisions more important, but it will also make TOC displays more important. How we present or display the information will assist in the decisionmaking process and help reduce “information overload.”

Determining the right answer concerning access and display will be difficult, but no less important. Access to and use of information is at the heart of the issue in Army XXI. In Army XXI, we are attempting to use information as a combat multiplier. We seek to use information so that we can know where the enemy is and is not, know where we are and are not, strike him with speed and lethality and precision, then follow through with

multiple blows before he can react. A doctrine that has as its norm restricted data bases may be counterproductive to achieving this overall goal. Determining the correct balance is a task of future doctrine.

4. Does Army XXI warfighting doctrine focus on the “right” enemy?

That conventional threats — sophisticated military forces with tanks, aircraft, artillery, air defense, electronic warfare and all the other capabilities of a modern force — remain is without doubt.⁸ Also without doubt some of these armies are in the hands of nation states whose foreign policy objectives conflict with those of the United States. Warfare and human nature have not transformed so radically that these kinds of threats have dissipated and, therefore, America’s Army of the 21st century ought not to focus on such potentialities. To think otherwise is both false and dangerous.

That said, however, doctrine writers would be equally wrong to ignore the expanding number and varieties of “nontraditional” adversaries and the “new” ways in which nation-states and other organizations use force to compel their adversaries to do their will. Today — right now — feudal lords, religious groups, ethnic groups, drug cartels, crime syndicates, even transnational corporations use force or the threat of force to achieve their objectives. Our nation has used peacekeeping, peace enforcement, supervision of cease-fires, enforcement of sanctions, and protecting the delivery of humanitarian assistance to compel our adversaries to do our will.⁹ The question for doctrine writers is this: Are we seeing new patterns of warfare emerge — or reemerge, depending on one’s historical start point? If so, to what extent, and how does this affect the war/operations other than war distinction? Additionally, doctrine writers, as well as those of us who execute, must face the difficult challenge of designing forces whose capabilities can adjust to and succeed in any one of a great variety of operational, environmental, threat and political environments.

Army XXI warfighting doctrine must evolve to capture these new realities. This will be difficult, for the very definition of war as the conventional armies of one nation-state battling those of another is a “bedrock” concept upon which most professional military and civilian strategic thinking rests. That bedrock appears to be shifting, for a number of complex reasons. Warfare can no longer be described simply as the armies of one nation-state fighting another. As uncomfortable as it is, a full concept of “war” must expand. The narrow definition of war is not wrong; rather, it is incomplete. The challenge to doctrine writers and practitioners is significant.

Technologies which are drastically different from their predecessors have always created the need for a doctrinal review — as have shifts in the geostrategic environment. Doctrine after the tank, radio and airplane, for example, differed significantly from that prior to the integration of those technologies into warfighting doctrine and organizations. Some may argue that we will not be able to answer completely the doctrinal questions until we field the technologies in question. Such an argument is partly true, but not wholly. We are now fielding the technologies as part of the Advanced Warfighting

Experiments, and we are also “testing” them in constructed and virtual realities. Parallel, not sequential, operations should be our goal in the development of doctrine which fits the technology we are considering. It should be the goal with respect to identifying the effects technology will have on soldiers and organizations as well.

Soldiers

Change in the kind of soldiers we have in the Army is already well underway; it started with the volunteer Army and the development of the Noncommissioned Officer Education System. Our soldiers are smart, they are motivated and they are, to a growing degree, married — at least by the time they are ready to reenlist.

Each of these characteristics is vital to the kind of Army we have and the kind we are building. We need soldiers who are smart enough to adapt to difficult, complex, ambiguous situations. We need soldiers who are smart enough not only to do what is expected of them — whether they are told to do so or not — but also to talk intelligently to the press about what they are doing and why. We need soldiers who are motivated, for ours is an Army that demands initiative. We need soldiers with the right values. Our soldiers want to do well, to succeed, to excel and to maximize all their talents.

Whether during the Gulf War, in Panama, in Somalia, in Haiti, on duty in Macedonia or Guantanamo Bay, or now in Bosnia, much is expected of our soldiers and junior leaders — and they deliver. Under tremendous pressure each day, under the eye of the international press, not to mention the chain of command, they do not let the nation down. Often the individual soldier or sergeant or lieutenant on the spot makes the difference between an international incident and an international success. Our soldiers are not only aware of this responsibility, they seek it and thrive within such an environment. Our soldiers know that they are very important to the success of the operations the Army has conducted.

1. Can we continue to attract and retain the quality soldiers and leaders Army XXI needs in the numbers and specialties required?

The characteristics that make our soldiers and junior leaders so effective are just those that are and will continue to be required in the information-age workplace among those some are starting to call “knowledge workers.”¹⁰ Why such a label? Because these kinds of workers do not merely do what they are told; rather, they apply to the situation specific knowledge that they have gained through study and experience, i.e., they use their judgment to solve problems. How different these soldiers are when compared to the “Willy and Joe” of World War II fame! These are just the kind of soldiers and junior leaders Army XXI needs, given the complexity and ambiguity of current and future operational environments as well as the kind of equipment now in service and being tested.

The future may not resemble the past with regard to recruiting and retention. That the Army will be able to attract and keep the resourceful, flexible, innovative, adaptable, motivated, intelligent men and women that we need is not a given. We cannot assume that we will have a pool of service-aged citizens who have the information-age skills **and** are motivated to join and remain in the Army. Demographics alone do not tell the complete story. Army XXI needs quality; quality is an essential characteristic without which failure is possible.

The issue is compounded by at least three factors. First, in the past our operating norm had been that soldiers — including leaders — are interchangeable. To some degree they were and still are, but as the knowledge content of work rises, and experience in applying that knowledge grows in importance, the retention and assignment policies of the past may not be sufficient to guide personnel programs necessary for Army XXI. A very simple example is found in comparing the Unit Level Logistics System (ULLS) operator of today with the Parts Load List (PLL) clerk of the past. ULLS operators are “knowledge workers” who, industry is finding out, “are no longer interchangeable ciphers performing simple repetitive tasks. . . . {Rather,} each possesses a specific set of skills and varieties of expertise, all of which are subject to continual upgrading.”¹¹ Second, private industry will be competing more and more heavily not only for the same population that we hope to recruit, but also for the proven performers that we hope to retain. This issue grows in importance as the promise of promotion diminishes, the numbers of PCS moves increase, and the frequency of operational or training deployments continues or rises. Third, retention is linked as much to a soldier’s family as it is to the soldier.¹² Quality-of-life policies and programs, therefore, will grow in importance with respect to Army XXI. This may dictate that Army assignment, PCS and school policies be developed to accommodate the importance of quality-of-life matters.

Army XXI may require more personnel stability for purposes of unit performance, soldier and family satisfaction, and retention. Finding the right balance between a power projection Army’s need to have soldiers and leaders who will “pick up and go at a moment’s notice” and sufficient stability required by the growing number of working spouses and other family needs will be a difficult challenge for Army XXI personnel policy designers.

2. Have we identified what the “quality criteria” are for Army XXI with sufficient specificity to use them in recruiting and retention?

Changing the post-Vietnam Army to that which won in Panama and the Gulf and succeeded in the ambiguity of Somalia, Haiti and Bosnia took over a decade. Using high school graduation, mental categories and other items, we identified specific criteria by which we measured quality. Then we recruited and reenlisted for more than 10 years against those criteria. The approach was, and remains, exactly correct. But the criteria by which we define quality may have to adjust to Army XXI realities.

Perhaps high school diplomas are necessary but insufficient. We need quality soldiers and junior leaders in all specialties — not just in the technical skills, but also, and

maybe especially, in the infantry. These are the soldiers and junior leaders who are the point of our spear and the aim point of the camera. These are also the soldiers and junior leaders who are adaptable and stable, who can figure out the right thing to do even if not told to do it. We need soldiers and junior leaders with initiative and judgment, who are stable under pressure. Of course, we have always needed soldiers and leaders with these characteristics. The point is, however, that given the fighting capabilities of Army XXI, the kinds of systems we are considering and the operational environment in which this force must win, soldiers and leaders with the characteristics mentioned above grow in importance.

In addition to high school graduation, we may want to consider demonstrated success in some kind of vocational training or extracurricular activity, or we may have to add to the enlistment process new tests which predict a person's adaptability, judgment or stability. Reenlistment programs may require more rigor as well. Those sergeants we retain may have to demonstrate some degree of computer competency; college or vocational classes may become even more important than they are now; and time off from work for self-study may become a requirement that commanders must fill. We may have to adopt a "continuing education" model similar to those of other professions to ensure our sergeants have the skills we need.

Thinking "outside the box" relative to Army XXI personnel issues is as important as it is in the doctrinal area. Now that downsizing is complete, promotion potential must increase or else the future is too bleak for us to expect our sergeants to reenlist. We may also have to consider incentives linked to the family, such as move bonuses to spouses for job hunting or school vouchers. Enhanced retirement benefits for certain reenlistment packages could also help.

Whether these specific suggestions are exactly the right ones is not important. The important point is: The Army "got it right" when it identified specific quality criteria we needed to rebuild after Vietnam. We can't assume that the same criteria will work for Army XXI. The future will be different from the past; new recruitment, assignment and retention programs are necessary.

3. How do we retain the core virtues which comprise the soldier ethic?

Soldiers fight for one another. The comradeship and cohesion that bind a unit together provide the prime motivation for a soldier to move forward under fire and in the face of death. Competent, self-sacrificing leadership plants and nurtures these characteristics and creates these kinds of units. A second aspect of the soldier ethic consists of the trust and confidence that must exist among commanders and their subordinates. Regardless of how complete one's situational awareness is, there will be times that a commander will have to act within the intent of his senior without specific instructions. In fact, as dispersed and fast-paced as the future battlefield will be, the ability to decentralize decisionmaking and execution will be vital. Without the trust in and confidence of one's senior commander, a subordinate is unlikely to act under conditions of uncertainty.

A third element of the soldier ethic concerns the bond between our nation and its soldiers. Our nation expects us to act on its behalf: We represent the United States of America and the values for which our nation stands. On deployment, whether training or operational, our behavior must reflect those values.

This ethic lies at the heart of what it means to be an American soldier. It has been true of soldiers in the past, it is true now, and regardless of technological advance, it will remain true. While we move forward into the information age, ever-increasing the technological component of our force, we cannot lose focus on this important dimension of fighting. Such a focus, however, is difficult to keep.

First, we are Americans; we like gadgets. We like technological fixes; we look for them and believe in them even in situations that defy technological solutions. Technology, however, has nothing to do with cohesion, self-sacrifice or executing one's duty when in extreme danger and without supervision. Technology does not imbue a soldier with the determination to fight on to the objective, "though he be the lone survivor."¹³ Technology does not motivate a new lieutenant to suffer along with his soldiers or a senior commander to share hardships and danger with his subordinates. One of the many challenges Army XXI will have is this: keeping this spirit alive on the high-tech battlefield.

Second, the digital battlefield will place greater distance between soldiers and between soldiers and leaders. With respect to soldiers, how one builds comradeship and cohesion among the soldiers of a unit within eye-to-eye contact is known. How will we do that when the contact is icon-to-icon? Is it possible? With respect to leaders, the temptation will be great for commanders to "lead from the command post" and to make decisions for their subordinates. With the power of the computer comes the power of seduction. That is, some will be seduced to believe, falsely, that decision should be centralized and execution micromanaged. Overcentralization and micromanagement kill initiative, and initiative is an absolute requirement on the battlefield. We must face these potential problems squarely, and solve them.

Third, representing the values of our nation implies that soldiers and leaders have moral standards and will act according to them. In a time of increasingly instant global media coverage, individual soldier actions and individual leader decisions often take on strategic importance. Every day, for example, our soldiers and leaders in Brcko face very difficult situations, the resolution of which could affect the strategic course of events in Bosnia. Moral standards and our nation's expectations that their soldiers adhere to these standards will rise in importance in the information age of Army XXI.

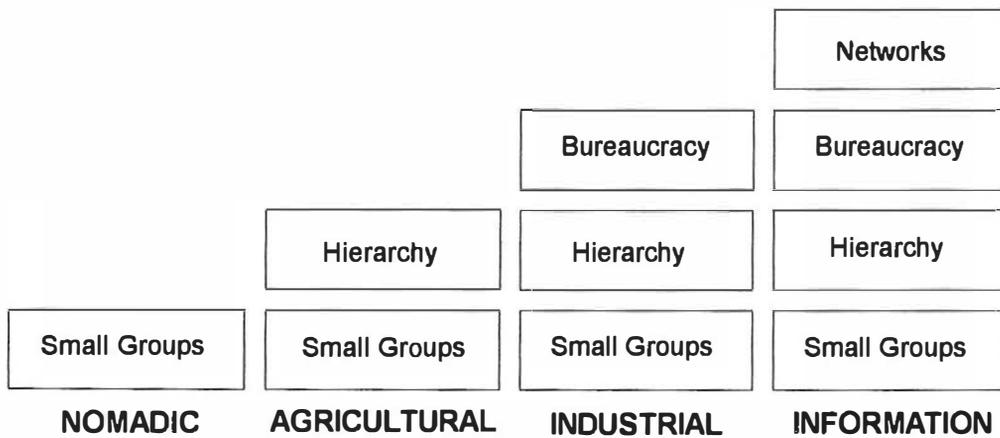
These nontechnological aspects of the future force may sometimes get lost in the "gee-whiz" fascination with gadgets. But there is a good argument to make that each of the three elements of the soldier ethic, and others not mentioned, are the *sine qua non* of Army XXI.

Organizations

1. Do we need all the levels of command that we now have?

The information age will not eliminate the utility of hierarchical or bureaucratic organizations, but it has already added a new type of organization, the network. Figure 3 depicts the development of organizations.¹⁴

Figure 3.



Weapons, technology, social and political arrangements, means of production, military doctrine—all are related to the organization of a military force. For example, a military force equipped with radios and trucks can be organized differently from one devoid of those items of equipment. Add aircraft, and a new dimension of organization becomes necessary. Doctrine too can have this effect. A military force whose doctrine requires movement along dispersed routes and precise convergence in a certain battle area will be organized differently from one whose doctrine is more unitary.

Other variables also affect military organization; the cause-and-effect relationship is complex. Often a set of conditions, rather than a single causal factor, results in a change to military organizations. The point here is not historical; it is future-oriented. Precision-guided munitions delivered from great distances; integrated networks of information concerning enemy and friendly locations, ground/air/sea fire delivery platforms, and ground maneuver forces; and access to a common data base from anywhere on the battlefield will alter the way we fight, which, in turn, will alter the way we are organized. The question is not **if** we will be organized differently, but **how** that new organization will look and **when** we will field this new organization.

Information-age organizations are flatter. We are already seeing this develop in the power projection strategic and theater-based logistics units. We should expect, there-

fore, to see it in our tactical units. Battalions, brigades, divisions, corps: Do we need each of these layers? One way to look at a headquarters is through its functions. Each of these four layers provides command and control — direction to its subordinate elements and assurance that the directives of the senior headquarters are executed. Each also identifies, coordinates and provides resources to its subordinates from its own stocks or from those of its senior headquarters. Finally, each passes information in the form of reports — operational, logistic, intelligence and others. Information-age technologies will accomplish many of the tasks which now require staffs and headquarters. A portion of any hierarchical bureaucracy, military or not, is associated with gathering and moving information. Technologies are obviating at least some of that need.¹⁵

Perhaps this particular challenge is our most difficult, for it is related to opportunities to command — key to leader development. The difficulty of the task, however, does not mitigate its importance. Nor does the difficulty change the reality that information-age technologies allow flatter organizations while increasing capability and productivity.

2. Can tactical command and control centers become split-based?

Another way to look at the command and control function is its location: forward, main and rear. Starting from the battalion level, tactical units have their headquarters echeloned from front to rear. Each size unit is a little different, but each follows the same principle. Information technologies suggest a different model, one borrowed from our space program — the “Houston-shuttle” model. Each time a shuttle is launched, its command and control node, Houston, remains stationary. Houston provides directives to the shuttle; monitors execution; identifies, coordinates and sometimes even provides resources; and passes information — all without ever “going into space.”

The analogy is not even close to perfect, but it does suggest something about knowledge-based organizations. What may be possible is this: sending forward only small command posts, one operational and a second logistic, that are backed up by semi-fixed operations centers that would remain either in the United States or at an intermediate staging base on land or sea. The forward headquarters would execute; the semi-fixed, gather and analyze information, plan and provide resources. The two might share the “directing” function.

Following the flow of digitally transmitted information, variations of the “Houston-shuttle” model are possible. For example, if battalions can transmit logistical requirements straight to the division, forward support battalions and brigade support areas **as we know them now** may become obsolete. Corps support commands could provide the CONUS-theater link, while division support commands provide the theater-tactical unit link. A similar reorganization may be possible in the intelligence area. Using information transmitted from all the battle operating systems and compiled into a command data base, the semi-fixed headquarters in CONUS or at an intermediate staging base could provide intelligence products all the way down to battalion level.

These suggestions may sound odd; they may even be wrong. The point, again, is not these particular suggestions — rather, that an information-based Army such as the one we are developing in the Army XXI process can, and will, be organized differently from the one we now have. Organization and the other elements of combat power must complement one another; all must be in harmony. Technology, doctrine, soldiers and organization must fit with leadership and training; increases in combat power result from the right balance among these component elements. Further, getting the right balance for an information-based Army will require thinking “out of the box.” Application of what worked in the past is no guarantee of success in the future.

Leadership

Army XXI, like all Armies before it, will rely upon leaders to translate concept into reality. Leaders will, in the final analysis, figure out how to adapt the military decisionmaking process, how to mass combat power from more dispersed locations, how to track future battles, how to sort through data bases, how to format and transmit digital information and how to organize optimally. Leaders will continue to adapt to new operational environments: conducting faster-paced combat action; synchronizing more complex conceptual problems with more widely dispersed varieties of sensors, weapons and units; succeeding in enlarged battle spaces; leading more sophisticated soldiers; balancing the accomplishment of mission with care of soldiers and families; running more complex, flatter organizations; and managing more information, faster.

Leadership, not technical solutions, is what is called for when situations are complex and ambiguous, problem definition is not clear-cut, and the way is uncertain¹⁶ — exactly the conditions that the Army faces right now, strategically, operationally and tactically.

1. Are we including in our officer and NCO education programs the technical skills needed by the leaders of Army XXI?

Knowledge and information lie at the heart of Army XXI’s military decisionmaking process, situational awareness and the decision-to-action cycle. We are building a set of computers and corresponding software to gather and process more information, analyze it faster, and present it to decisionmakers (leaders). We are changing the processes by which information is identified, gathered, stored and used.

How to manipulate a computer is not the key issue. That skill is important, but more important is skill at information management. All of us have grown up in a tactical Army in which information management meant radio-based reports, transcribed by radio operators onto paper, distributed by TOC sergeants and displayed on “TOC chartology.” We decided upon what information had to be displayed, by which units and at what time. We built processes — tactical standard operating procedures (TACSOPs) — the result of which would be timely and accurate information displayed on the charts, and we learned

how to make decisions based upon that information. The TOCs of Army XXI will be different; so will the processes; so will the decisionmaking system; and so will the TACSOPs. Building and mastering the skills necessary to make decisions quickly using computer enhancements, expert systems, masses of data — under pressure and uncertainty — will take time. The study of information management and the use of information, therefore, must become items of intense military study and practice. Our military education systems — officer and NCO — should begin now to prepare information-age leaders.

2. Do our schools and training experiences do all that they can to prepare leaders to think?

Essential to successful Army XXI operations is precise and well-reasoned judgment exercised not only by soldiers and junior leaders on the spot, but also by battle captains in our operations centers and commanders on the battlefield. Judgment, however, is a function of both experience and logic — the application of general principles to specific situations. A challenge of the Army XXI professional education system, therefore, is to figure out a way to increase the number and intensity of experiences in which students must judge, see the effects of their decisions, then rejudge — judgment situational training exercises (STXs)! The recent chess grand master's defeat of an IBM super computer illustrates just how important judgment can be even if we adopt expert systems into military decisionmaking.

To some degree, we emphasize leader judgment in daily decisionmaking, as well as in the military school system. What is required for Army XXI, however, is a more rigorous approach to teaching, building and sustaining judgmental skills. We could teach these skills in our military schools, mandate required self-study, use local community colleges in a type of continuing education, or develop other alternatives. The issue is not “how”; rather, the issue is acting: adopting a specific program to address this critical need.

A related issue, and one linked to Army XXI organizations, is this: Given the complexity of the environment, the presence of the media, the speed with which decisions have to be made and the experienced judgment needed to make these decisions, perhaps now is the time to upgrade command at the company level. Major may be the appropriate rank for company command, with captains as executive officers or even platoon leaders, and lieutenants as deputy platoon leaders. The Army made a similar move when it upgraded command in aviation units. Similar logic may apply now in armor and infantry units, and perhaps others.

3. How will Army XXI alter leadership skills?

The impact of high-quality soldiers and the importance of their families has been incorporated for a number of years into our leader development and precommand train-

ing. Perhaps we need even more emphasis throughout the leadership ranks, for these are areas directly related to generating and sustaining combat power. Leaders who understand the qualitative edge required in Army XXI will attend to developing and sustaining that quality in their units.

The psychology of the workplace is also changing.¹⁷ This change is a reflection of the social changes that our country has undergone and is undergoing. It is also a manifestation of how work is done, who does it and with what equipment, and how that person or team is supervised. Further, it is a consequence of the generations that now compose our Army. Last, it is a result of the demographics which describe our Army. We have already adapted and will continue to adjust to these changes. No doubt some of the basic principles and skills of leadership remain as valid as ever. Equally true, however, is that leading in the Army of 1996 is different, much different, from leading the 1976 Army. The same will be true of the Army of 2016, the leaders of which are in uniform now. The challenge to our leader development program is to anticipate.

Concerning decisionmaking, judgment and leadership, one could argue that the Army has a model program. Perhaps that is true today. But what about the future? We can't wait until the technology is developed fully to begin training leaders to make computer-assisted decisions or to lead under conditions completely different from those with which they are now familiar. That will be too late. Technology is changing at a rate faster than our leader training. Leaders have to use the technology when fielded. Leader preparation should begin now; some already have begun the process.¹⁸ Whatever specific software ends up being adopted, we already know that information management and computer-assisted decisionmaking will be required of future leaders. We can start now teaching leaders the logic upon which both of these critical areas are based—knowing that leaders will be able to apply their knowledge to a particular case. In a corresponding way, we do not yet know exactly the dynamics of an information-based unit. But we do know that they will be different, and there is plenty of literature discussing the possibilities. This kind of information should be introduced into our leadership classes now. Arming leaders with the right conceptual frameworks helps them to figure out how to solve yet-to-be-identified problems. Without such a framework, however, they will apply yesterday's theories to today's realities. Not good.

Training

The complex, post-Cold War operational environment is one in which leaders of America's power projection Army often assume responsibilities broader than those for which they have been specifically trained. We expect platoon leaders to think and act as battalion commanders; company commanders, as brigade commanders; battalion commanders, as division commanders and so on. Operations such as Panama, Somalia, Haiti and Bosnia demonstrate that we need battalion executive officers and operations officers with tactical and political acumen. Some corps and division staffs have

expanded, often on very short notice, to become joint task forces. Adapting leaders to the complexity of this new operational environment, especially when combined with decreasing force structure and budget and increasing requirements, would be difficult enough. But the technology of the information age adds another dimension of complexity.

The responsibilities of information-age leaders broaden even further. For example, battle captains of Army XXI brigades will have to orchestrate the combat power usually associated with a division. The information management skills of unit executive officers and chiefs of staff are much more difficult than those of their immediate predecessors. The battle space of future brigade and division commanders expands not only physically but also dimensionally and conceptually: A commander of an Army XXI unit must “fit together” into a cohesive battle or campaign plan more assets, of greater variety, over huge distances, to accomplish complex tasks under rigorous political, military and media constraints.

The operational environment of the post-Cold War — a smaller Army with a reduced budget, increased employment requirements, and the technology of the information age, all coinciding in time — has already and will continue to stress leaders and their capabilities.

1. How can we increase the experience base of leaders when their time assigned to operational units is lessening?

We will have to develop new training strategies. The first of these could be called “Continuous Immersion Training.”¹⁹ Immersion training is that training conducted via virtual reality situational training exercises. At the platoon level, for example, a lieutenant would sit at his computer station and take his “virtual” platoon on a mission. From the planning and preparation phases, through the execution and recovery phases, the program would call for the lieutenant to make decisions upon which the continuation of the mission would be based. Each “good” decision and each “poor” one could be identified and provide a learning opportunity. Similar training exercises could be constructed for other levels of command as well as for staff officers and NCOs. These kinds of exercises seem the logical extension of the simulation training now available for medical specialties, air defense units and fire support teams. If we can train doctors using “virtual surgery,” we can certainly devise similar virtual realities to train our combat leaders.

Such an approach, while never substituting for “real” training, may still offer several advantages. First, in a short period of time the person being trained can “execute” many iterations of a particular task, thus increasing the trainee’s experiential base. Second, conditions can be changed easily, thus increasing the trainee’s breadth and depth of experience. These first two elements constitute “immersion” training. Third, this training can be distributed anywhere, especially with the growing access to the Internet. Thus, training can be continuous. That is, we need not move a leader, thus incurring temporary duty

(TDY) or permanent change of station (PCS) costs. Given the kind of “log-on” and “log-off” records that are now possible, we can devise training strategies that require leaders of whatever rank to conduct a specified number of training iterations per whatever time period doctrine deems appropriate to develop or sustain proficiency — a kind of continuing education requirement.

The point is this: We need leaders with more experience than they can get in an operational assignment using standard Mission Training and Evaluation Plan (MTEP) situational training exercises or professional development sessions. If we expand our definition of “experience” and use technology to compress the time, we may be able to devise a training strategy to fit the need. The kind of simulations suggested above will never substitute for “the real thing” — although some virtual reality tasks may ultimately come close — but they can augment, supplement and complement.

2. How do we combine the requirement to reduce personnel tempo (PERSTEMPO) for stability purposes with the simultaneous requirement to maintain operating tempo (OPTEMPO) for training purposes?

Part of the answer to this question lies with the use of distributive technologies. With respect to schools, perhaps we can distinguish between a “culture-producing” and a “skill-producing” school. An example of the former would be basic training where we are shifting a soldier’s or an officer’s cultural perspective from civilian to military. Other examples: the primary leader development course which shifts from soldier to noncommissioned officer, or the command and general staff officer course which shifts from company grade to field grade. These schools require separation from unit, for a culture shift requires that separation. Advanced Individual Training (AIT), the officer advanced course, Combined Arms and Services Staff School (CAS³), and the basic and advanced NCO courses (BNCOC and ANCOC) are examples of the schools that enhance skills. These require no PCS. We could take the requirements of the “skill-producing” schools, set annual “gates” which officers or NCOs would have to meet, and make a combination of on-line self-study, use of local community colleges or reserve centers, and distributive technologies. In effect, the Army could develop a “continuing education” requirement similar to those required by many other professions. This kind of approach could reduce the amount of time away from home and unit while building and sustaining proficiency at critical skills.

A second part of the answer lies in maximizing distributive simulations during BCTP rotations and warfighter exercises. A unit at Fort X can participate fully in a simulation at Fort Y without moving from X. Backbriefs or rehearsals can be accomplished via video teleconference. Some exercises already use this kind of approach; others could as well.

A third possibility concerns determining the minimum frequency with which a unit — battalion, brigade, division — must participate in simulation exercises, joint readiness exercises, off-post training deployments, and combined training center rotations to sustain proficiency within the band of excellence. Then this minimum frequency could

be used as the standard by which we identify units to participate or deploy. This approach, applicable to active, Army National Guard and Army Reserve units, could help assure that the Army retains deployment proficiency and out-of-country experience. Further, when combined with a reduced “PCS school” load and an “on-line” continuing education program, this kind of approach could help stabilize our force and increase predictability for our soldiers and leaders.

Again, these particular suggestions may not be the ones we should adopt. But some new training strategies must surely emerge as the set which is appropriate given all the elements of combat power: technology, doctrine, soldiers and organizations, leadership and training. Balancing these five factors for whatever force comes out of the Army XXI process is as important as it was when we created the current Army from that of the post-Vietnam period. It requires thought before action; it requires tough choices; it requires organizational discipline, for we will have to continue figuring all this out under real conditions — tight budgets, fixed costs, operational and training requirements, and continued reengineering — just as we are now.

Conclusion

Real conditions make implementation of change and the snatching of the opportunities afforded by our particular place in history difficult, but they do not mitigate the requirement. The Louisiana Maneuvers, the Advanced Warfighting Experiments and the overall process of Army XXI — all indicate that the Army is already on the right path. The path is not an easy one now, nor will it be in the foreseeable future. The path is steep; it’s rough; it’s dangerous. Obstacles threaten to slow or stop current momentum, but yielding to such threats would be unfortunate. For the information age will keep on coming, whether we like it or not. The information age and its effects on the conduct of war require us to reexamine each element of combat power with “new eyes” and “new mind sets.”²⁰ The product of the Army XXI process, whatever it is, cannot be merely an “upgraded” version of today’s Army.

If the nation asks us to “refight” a Panama, a Gulf War or a Haiti, we do **not** want to fight it as we did in the past. Our potential adversaries already have studied our past operations carefully. Should we be asked to conduct operations similar to those mentioned, we must fight them differently; decisive victory lies in asymmetry. Furthermore, the kind of adversary we will face is itself changing — at least in part. Conventional threats remain, but the number and variety of “nontraditional” threats is growing.²¹

The Louisiana Maneuvers and Advance Warfighting Experiment processes, as well as the conceptual work already done, have developed a picture of the future sufficient for us to have confidence in the direction we are going. One needs only to read last year’s or this year’s “Green Book” (*The Army Budget*); understand the scope of the Officers’ Personnel Management System (OPMS) 21 Study; and see the work that TRADOC is doing with the “Army After Next” and distance learning — as well as the many

programs in other major Army commands (MACOMs) and agencies — to see that we are already well underway. Certainly the questions discussed in this essay are not exhaustive, but they are representative of the kinds that we must entertain and study. They are the kinds of questions from which we cannot escape. Balancing near-term requirements with preparation for the future is our only option. That's the only way to guarantee our position as the best army on the face of the earth. This is certainly an exciting time to be in America's Army.

ENDNOTES

1. Martin van Creveld, *Technology and War* (New York: The Free Press, 1989). See also van Creveld's description of "fighting power" in *Fighting Power* (Westport, Conn.: Greenwood Press, 1982), pp. 3-4 and 171-174. Van Creveld is not alone in his claim. See also: J.F.C. Fuller, *The Secret of Future Victories*, Gen. (ret.) Paul F. Gorman ed. (Fort Leavenworth, Kans.: U.S. Command and General Staff College Press, 1994); John Keegan, *The Face of Battle* (New York: Viking Press, 1989); Richard Simpkin, *Race to the Swift* (New York: Brassey's Defence Publishers, 1985); or Christopher Bellamy, *The Evolution of Modern Land Warfare* (New York: Routledge, 1990).
2. Brig. Gen. Robert H. Scales, Jr., *Certain Victory* (Fort Leavenworth, Kans.: U.S. Command and General Staff College Press, 1994), pp. 1-38.
3. U.S. Army Training and Doctrine Command Pamphlet 525-5 *Army XXI Operations* (Fort Monroe, Va.: U.S. Army Training and Doctrine Command, 1994).
4. Gen. Gordon R. Sullivan and Secretary Togo D. West, *Decisive Victory: America's Power Projection Army* (Washington, D.C.: Department of the Army, October, 1994).
5. Gen. Gordon R. Sullivan and Col. James M. Dubik, *Envisioning Future Warfare* (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College Press, 1995).
6. The 1/3 - 2/3 or 1/5 - 4/5 rule refers to the general principle that commanders and staff should use 1/3 to 1/5 of the available planning time for themselves, leaving 2/3 to 4/5 of the time to their subordinates.
7. For a discussion of how businesses are using the centralized data base — i.e., a common picture of the business environment — to assist in decentralized decisions and actions, see Jessica Lipnack and Jeffrey Stamps, *The Age of the Network* (Essex Junction, Vt.: Oliver Wright Publications, 1994), especially pp. 44-46 and 70-71.
8. North Korea, Iraq and China all stand as perfect examples.
9. Sullivan and Dubik, *Envisioning Future Warfare*, p. 10.
10. For a more complete discussion of employee requirements in the information age see: Peter F. Drucker, *Managing in a Time of Great Change* (New York: Truman Talley Books, 1995), pp. 71-72, 86-89, 226, 236-38, 246, 254-57; Price Waterhouse Change Integration Team, *The Paradox Principles* (Chicago: Irwin Professional Publishing, 1996), pp. 32, 62-66, 69-74, 78-79, 82-84, 125; Alvin Toffler, *Powershift* (New York: Bantam Books, 1990), pp. 204-217; and Francis J. Gouillart and James N. Kelley, *Transforming the Organization* (New York: McGraw-Hill, Inc., 1995), pp. 263-85.

11. Sally Helgesen, "Leading from the Grass Roots," in Drucker Foundation, *The Leader of the Future* (San Francisco, Calif.: Jossey-Bass Publishers, 1996), p. 21.
12. Maj. Angela M. Manos, "America's Army Family: Yesterday, Today, and Tomorrow" (unpublished); and Maj. Angela M. Manos and David R. Segal, "Behavioral Science Research in Support of Soldiers and Their Families" (unpublished).
13. Department of the Army Field Manual (FM) 7-85, *Ranger Unit Operations* (Washington, D.C.: U.S. Department of the Army, June 1987), p. E-1 (excerpt from the Ranger creed, 75th Ranger regiment).
14. Lipnack and Stamps, *The Age of the Network*, p. 41. One can also read of the transformation of organizations in the following brief list: Price Waterhouse Change Integration Team, *The Paradox Principles*, pp. 12-13; Tofler, *Powershifts*, pp. 261-262; Peter Drucker, *The New Realities* (New York: Harper & Row, Publishers, 1989), pp. 207-220; Michael Hammer and James Champy, *Reengineering the Corporation* (New York: Harper Business, 1993), pp. 13-17.
15. James Champy, *Reengineering Management: The Mandate for New Leadership* (New York: Harper Business, 1995), pp. 19-22.
16. Ronald A. Heifetz, *Leadership Without Easy Answers* (Cambridge, Mass.: The Belknap Press of Harvard University Press, 1994), pp. 69-100, esp. 74-75.
17. Drucker, *Managing in a Time of Great Change*, pp. 65-69; Lipnack and Stamps, *The Age of the Network*, pp. 203-32; Toffler, *Powershift*, pp. 190-217; Gouillart and Kelly, *Transforming the Organization*, pp. 287-314. For an especially interesting and stimulating way in which these changes may affect military units, see Lt. Gen. (ret.) Frederic J. Brown, PhD, *The U.S. Army in Transition II* (New York: Brassey's (US), Inc., 1993), pp. 107-115.
18. I refer here to the elective course at the Command and General Staff Officer's College concerning the digital battle staff and to the exercise Prairie Warrior, especially the portion dealing with the mobile strike force. As important as these are, however, they are the proverbial "drop in the bucket."
19. In this idea, I have borrowed heavily from Brown, *The U.S. Army in Transition II*, pp. 102-06, 116-24 and 137-44.
20. Drucker Foundation, *The Leader of the Future*, p. xvii.
21. Sullivan and Dubik, *Envisioning Future Warfare*, pp. 8-11, 37 and 52. See also Alvin and Heidi Toffler, *War and Anti-War* (New York: Little, Brown and Company, 1993), and Martin van Creveld, *The Transformation of War* (New York: The Free Press, 1991).