A Swift, Elusive Sword

WHAT IF SUN TZU AND JOHN BOYD DID A NATIONAL DEFENSE REVIEW?

CHESHER W. RICHARDS
This study is a product of the Center for Defense Information’s new Military Reform Project. The project’s goal is to regenerate vigorous debate over the uses, strategy, doctrine, and forces of the U.S. military, and to address the deep institutional problems currently vexing the military. The project intends to serve as a home for military reformers, and its products are being designed as tools for expression of a wide range of analysis and views. Interested parties are invited to contact the project for further information: http://www.cdi.org/mrp/, Marcus Corbin, mcorbin@cdi.org, 202-797-5282.

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SECOND EDITION

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About the Author

Chet Richards was an associate of the late Col. John Boyd from 1973 until Boyd’s death in 1997. He reviewed all of Boyd’s major works and worked closely with him on applying the concepts of maneuver warfare to business. Dr. Richards has consulted in this area since the early 1990s and operates a web site devoted to making Boyd’s strategies accessible to businesses: http://www.belisarius.com. He holds a Ph.D. in mathematics and recently retired as a colonel in the Air Force Reserve, where he was the Air Attaché (Reserve) to Saudi Arabia.

Always moving, do not sit down, do not say “I have done enough.” Keep on; see what else you can do to raise the devil with the enemy.

— Gen. George Patton’1
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A Swift, Elusive Sword was published in July 2001. At that time, “fourth generation warfare” (4GW) was an esoteric concept practiced in distant countries by bearded religious fanatics. The defense budget bobbed along just below its Cold War average, which seemed adequate given that the mighty Soviet Union had collapsed a decade before. And “transformation” was the talk of Washington, D.C., driven by a cagey Secretary of Defense who had the dual advantage of previous experience in the job and of running complex high-tech companies for a generation since he last looked out from the E-ring of the Pentagon.

Since then, nothing of substance has changed, and so I have not changed the text of A Swift, Elusive Sword.

That a group of people willing to use whatever level of violence they thought necessary was able to seize four civilian airliners and fly three of them into buildings was riveting, but it did not lead to Islamic revolution in the Middle East. Thugs have always been able to commit horrendous acts — it is what society does to punish them and prevent or deter others that is important. So far the verdict is mixed.

We easily threw out the existing government of Afghanistan, but then so did the Soviets in 1979, and it is too early to know if we will fare any better after the novelty wears off. The Taliban were certainly accessories to the 9/11 crime, but it appears now that a large fraction of the perpetrators — al Qaeda — escaped. Most of the al Qaeda we caught in Afghanistan were jihadi wannabes who, like John Walker Lindh, ended up as conventional troops fighting against the Northern Alliance. As of this writing, nobody knows
where Osama bin Laden and his hardcore followers are. What is worse, al Qaeda is not the oldest, may not be the best organized, and is probably not even the most dangerous of the violent groups targeting the West. It is not even clear if it is a real “organization” or some type of loose federation that provides financing and networking to operationally dispersed cells. Eighteen months after September 11, 2001, we just don’t know.

With the sole exception of reinforcing cockpit doors, none of the changes to our commercial air system would have bothered Mohammad Atta and his associates in any way. They carried nothing illegal through airport security, and they showed proper identification whenever asked. What did change, and it changed over western Pennsylvania that very morning, was that it will be much more difficult to take control of an airplane from a passive group of passengers and flight crew. But this has nothing to do with the defense issues in this book, other than to illustrate the strange nature of fourth generation warfare. The communists got one thing right when they described what we call the fourth generation as “people’s war.”

If you have not already read the seminal paper on the subject by Bill Lind, LtCol GI Wilson (USMCR), COL Keith Nightengale (USA), COL Joseph W. Sutton (USA), and Capt John Schmitt (USMC), I urge you to do so now. You can find it, along with a wealth of other material on 4GW at http://www.d-n-i.net/second_level/fourth_generation_warfare.htm.

One thing did appear to change, although we might question how viable it ever was: transformation is dead. Donald Rumsfeld fought the good fight; for this we must give him credit. For the first time since Dick Cheney held the office, a secretary of defense succeeded in shutting down a major Cold War era program, in this case the lumbering Crusader artillery system, which could charitably be described as a weapon for second generation warfare. And there transformation stopped. The American political system is lubricated by pork, and nobody truly believes there will ever be another war against a formidable adversary, so providing effective defense remains secondary to ensuring reelection.

Looking back, “transformation” the way it was defined was not going to solve our defense problems. “Skipping a generation of weapons,” had it occurred, would have starved the defense industries’ production base and in the end swapped one brand of pork for another. True transformation doesn’t focus on weapons, the least important factor in combat effectiveness, but puts
emphasis on people and ideas. This is well understood by those who have to
do the fighting. Adding to the growing literature on the people factor, Army
MAJ Don Vandergriff published the latest in his series on personnel man-
agement, The Path to Victory, in May 2002 (Presidio).

Are we closer to the quick striking force envisioned in A Swift, Elusive
Sword? You might think so, just looking at the hardware: The Army wants to
field Stryker wheeled fighting vehicles that would be much lighter than tanks,
and the Marines have programs underway to develop even more advanced
light armor. But the hardware wish list tells very little. We could conduct
operations as described in this book very well with the hardware we have
today. Our failure is a lack of ideas and enough people with the vision to
execute them.

As I am writing this, we are completing a months-long buildup of another
massive conventional army, said to eventually number 150,000 troops, for a
second round at the only person on the planet dumb enough to sit and watch
us do it, again. By the time you read this, you will know if we attacked and
how well our forces did. The question of whether such a strategy of tele-
graphing our intentions months in advance would work against anybody else
is still open. One suspects it would not impress John Boyd or Sun Tzu.

Finally, we seem to have lost ground in the arena of grand strategy, that is,
of ensuring the support of our allies and attracting the uncommitted to our
side, while building up our own internal cohesion and most important, isolat-
ing our adversaries. An effective grand strategy is essential for carrying out
the rapier-like operations advocated in this book. As of mid-February 2003,
we are receiving unqualified support largely from newly-minted allies in coun-
tries most Americans could not locate on a map, and whose devotion is, one
suspects, driven by as much by our money and hope of future assistance as by
the rightness of our cause.

Perhaps the only real change since mid-2001 is that John Boyd, the late
Air Force colonel whose ideas form the strategic framework for this book, is
finally beginning to receive some of the credit he deserved in life. At about
the same time this book appeared, Prof. Grant Hammond, chair of Strategy
and Technology at the Air War College, published The Mind of War
(Smithsonian Institution, May 2001), a quite readable summary of Boyd’s
career and exegesis of his ideas. One year later, Keith Hammonds wrote a
long piece on Boyd for managers and entrepreneurs entitled, logically, “Strat-

Nothing that has happened in the last two years, however, changes the primary conclusion of the book: that our defense strategy is unsustainable fiscally and increasingly less effective militarily. Since the inauguration of the new administration, we have swung from paying down the national debt to adding to it in amounts not seen since the Reagan era. Much of this still goes to buy weapons designed to defeat the Soviet Union and to provide forces that seem to move in slow motion. In the meantime, more baby boomers (including this one) are approaching retirement, and the non-military components of national power — health, education, diplomacy, the strength of our economy, the checks and balances that preserve our liberties, and respect for and enforcement of the law — continue to erode.

Chet Richards
Atlanta, Georgia
February 2003
Executive Summary

What kind of question is: “What if Sun Tzu and John Boyd did a National Defense Review?” Sun Tzu, if he existed at all, has been gone some 2,500 years. The late Col. John R. Boyd, U.S.A.F., while intimately involved in fighter aircraft design during his active duty years, wrote practically nothing on hardware or force structure after he retired, when he created the strategic concepts for which he is best known today.

Yet these two strategists offer a solution to the dilemma now confronting the U.S. military: U.S. spending on defense exceeds by several times that of any combination of threats, but the services still face cancellation of weapon systems and shortages of money for training, spares, and care and feeding of the troops. The only solution offered by political leaders is to spend even more.

Sun Tzu and John Boyd offer a way out because they considered the problem of conflict in a wider scope. They explored the essential, but limited, role of military force in resolving conflict, and they examined in some detail the issue of “What makes a force effective?” The answers they derived are largely independent of the particular age in which one dwells and the specific weapons one uses.

Sun Tzu (c. 500 B.C.) emphasized harmony on the inside in order to create and exploit chaos outside. If done well, such a strategy eliminated, or at worst greatly reduced, the need for bloody battles. Employing time as his primary weapon, Sun Tzu strove to create ambiguity in the minds of enemy commanders as the milieu for weaving his web of surprise, deception, and rapid switching between orthodox and unorthodox tactics. The ideal result is “to win without fighting.”
Similarly, Boyd (1927-1997) used his well-known “observe-orient-decide-act” pattern to “operate inside his opponent’s decision cycles” generating first confusion, then frustration, and finally panic in the enemy ranks. Once thus set up, the enemy could be finished off with a bewildering array of distracting and probing attacks, leading to multiple thrusts aimed at destroying his cohesion and collapsing his will to resist. A primary measure of merit was prisoner – not body – count. To allow forces to sustain such high operational tempos, Boyd codified an “organizational climate” derived from such diverse sources as Sun Tzu, the German blitzkrieg, and the early Israeli Army.

Recently, officers primarily in the U.S. Army and Marine Corps have completed detailed recommendations on how to change personnel management systems to foster Boyd’s organizational climate. Boyd’s formula of “people–ideas–hardware, in that order,” holds as well for warring states on the plains of ancient China as for guerilla warfare or national missile defense today.

This paper attempts to make four fundamental points:

1. What is important is forces – combinations of people, ideas, and hardware – not individual weapons programs.

2. The strategic framework expounded by Sun Tzu and John Boyd provides a coherent and historically validated method for comparing one force with another.

3. Neither Sun Tzu nor Boyd gave explicit guidance on selecting hardware. One can, however, construct hypothetical forces including a hardware component and, using their framework, compare them to current and planned U.S. forces.

4. To illustrate this process, this paper posits one such force and claims that not only would it be more effective than what the United States has today, but that it would require significantly fewer resources (although that is not its primary purpose).

This synthesis relies heavily on the style of fighting Boyd espoused, which he derived largely from Sun Tzu and from commanders, including Americans such as Grant and Patton, who employed this style with remarkable success down through history. One can use the precepts of what is now called “maneuver warfare” to help choose between alternative force structures, but not, as it turns out, between individual weapons.
SUMMARY OF AN EVOLUTIONARY FORCE:

A. Personnel system that fosters trust, cohesion, and leadership.
B. Doctrine built around third and fourth generation warfare ideas.
C. Land forces, a U.S. Strike Force, built around:
   • Current active U.S. Marine Corps divisions
   • U.S. Army 82nd Airborne Division
   • Special Forces
   • Rangers, Delta Force, etc. expanded as necessary
   • SEALs and other U.S. Navy and U.S. Air Force unconventional forces
   • Carrier and land-based tactical air
   • New aircraft for direct support and shaping of land combat
   • Heavy armor & mechanized infantry capability in elite Reserve / Guard units
   • Intra-theater lift
   • Seaborne fire support (battleship as interim)
D. U.S. Mobility Force composed of:
   • 6 aircraft carrier (CVN) task forces
   • Inter-theater air and sealift
   • Attack submarines (SSNs) (in addition to those in the CVN task forces)
E. U.S. Strategic Force composed of:
   • All strategic offensive assets (bombers, missiles, ballistic missile submarines)
   • All strategic defensive interceptors, if any become operational
   • Space assets
F. Robust research, development, prototyping, and experimentation to support the above areas.
G. Greatly increased emphasis on intelligence, including revamping the personnel system to make it co-equal in stature with operations.
The force, outlined in broad terms, may strike some as radically improbable, and as one which could never be adopted by the U.S. defense establishment. This could well be true, but is more a statement about the stability of the current military-industrial-congressional complex than the efficacy (or lack thereof) of these proposals. It is also irrelevant. The United States is not going to adopt this force. But it does illustrate what the forces could evolve into, if the United States adopted the eminently feasible measures regarding people and ideas.

Briefly, this paper suggests deactivating from the U.S. Army that part of it which is unlikely to reach a theater of conflict while any modern war is still going on. The Marine Corps and those units of the Army generally called “unconventional” would remain. Properly supported, this provides a mobile striking force that could rapidly descend on any part of the globe, should that prove desirable, and strike directly at the heart of an enemy nation. It could have won the Gulf War several months sooner than the ponderous formations eventually deployed. This study does assume, as did Boyd and Sun Tzu, that for all but the briefest operations, the United States will fight in conjunction with allies.

However, readers should not focus so narrowly on the hardware illustrations that they ignore the people issues that are the bulk of this paper, as they are of Boyd and Sun Tzu. These address the core of force effectiveness – why people fight, why they polish their fighting skills, why they refuse to quit until they have won. The recommendations in this section draw heavily on recent studies carried out by current and former members of the U.S. Army. Ironically, implementing just these suggestions would improve our defense posture far more than tinkering with weapons programs, and would save considerable money at the same time.

Finally, and as an application of these principles, I examine the problem of how to deal with the threat posed by weapons of mass destruction of all types, of which “national missile defense” represents only one component, and perhaps the least likely, but the one most attuned to our current military-industrial-congressional situation.
Introduction

One might have thought that with the collapse of the only country that could threaten the U.S. military, American leaders would have ordered the Pentagon to radically reconfigure the forces, reduced the corresponding budgets, and put those resources to more productive uses elsewhere in the economy or returned them to the taxpayers. Spending did indeed drop, but only from the Reagan peak back to the Cold War norm. (See Figure 1.) With the disappearance of the Soviet Union, this is now roughly three times what any conceivable combination of “threat” countries is spending, but many in both major U.S. political parties insist it is not enough. (See Figure 2.) Congress is competing with itself to raise the defense budget, recently voting to add $8.7 billion on top of the approximately $14 billion the new administration already added to the outgoing Clinton submission. Members are warning that hundreds of billions more may be needed to fund reserve modernization, national missile defense, and unforeseen contingencies.³

Something is badly wrong.

Partly that something is straightforward politics. Even when the using service and the secretary of defense have expressed a need for the weapon, it represents votes from the employees who work on the program, and from other constituents who believe that these programs are good for the district or who simply see defense contracts as elements of civic pride. Absent of such a need, defense programs are jobs programs without the “welfare” label.⁴

But more seriously for national security, elevated defense spending also represents evidence of a failed paradigm, that “capability” and hence “security” are functions of how much money is pumped into them. If the United States spends more, it must be getting more. The fact that this paradigm has
failed is evident from the numbers: If three times the threat isn’t enough, what is? Actually, it is worse than that. By focusing the debate on spending, the United States is not thinking clearly about what really makes an effective military force. After all, France greatly outspent Germany during the interwar years, especially on designing and building the Maginot Line, but lost in three decisive weeks in the Spring of 1940. And it is impossible to even guess by how much the United States outspent Vietnam. One should not be too quick to rule out cause-and-effect in these cases.5

Increasing U.S. defense spending at this point is very much like giving more food to a very obese, but very hungry and insistent, relative. It may quiet him down for a few minutes, but somehow you know it isn’t the solution to his problem.

To begin to answer the question of “What could be done to improve the Defense Department (DoD) and its forces?” one must first ask, “What makes one force more effective than another?” Which immediately leads to the question of “Effective at what? What role should military forces play in furthering
our national interests?” It does not take much imagination to see that differences in the answers one gives to this question will make large differences in the types of forces one buys and operates. If one envisions U.S. military forces as global enforcers, for example, taking the primary responsibility for suppressing opposition to U.S. interests, one arrives at a quite different military than one charged primarily with territorial defense of the United States.6

This paper offers a different framework for thinking about defense issues, one that could lead to a significant increase in the effectiveness of U.S. military forces, one that is based on a coherent strategy with a track record extending back 2,500 years, and one that would return a good deal of money to the treasury or to the people. To explain this assertion, which seems incredible in an era where “Spend more!” is the answer to every problem, this paper will examine in some detail the concepts first written down by Sun Tzu and most recently renewed by the contemporary U.S. strategist, John R. Boyd.
Sun Tzu and John Boyd

What changes would Sun Tzu or John Boyd make to U.S. forces, and to DoD in general, if they were conducting a National Defense Review? Sun Tzu, by way of explanation, wrote the earliest extant treatise on military strategy, dating from around the 5th Century B.C.7 The late U.S.A.F. Col. John R. Boyd (1927-1997) drew heavily on Sun Tzu’s works in his examination of strategy, “Patterns of Conflict,” which he compiled in the late 1970s to mid-1980s. A synopsis of their ideas, as might apply to a major defense review today, appears in the next sections.

This paper will work backwards, starting with the role of armed forces in national defense, then examining what Sun Tzu and Boyd had to say about what made forces effective in fulfilling those roles, and finally ending with some specific suggestions for creating more effective forces.

Sun Tzu

Although there appears to be broad agreement that some one individual, probably a high level commander, wrote the bulk of what is now known as The Art of War, there is less agreement on when he lived and serious disagreement over how to translate much of the text into modern English.8 The consensus is that a certain Sun Wu (the “Tzu” is an honorific, usually translated as “Master”) lived in what is now eastern China just before the “Warring States” period (and perhaps overlapping its early years), which lasted from 453 to 211 B.C. Interested readers are referred to any of the introductions to modern translations for further speculation on the historical figure of Sun Wu.

Salient points for the current discussion, which are generally agreed by the major interpreters, include:
1. The text presents a coherent theory of armed conflict, suggesting that it is largely the work of a single individual.

2. The “Thirteen Chapters” of *The Art of War* have survived basically unaltered since at least 100 B.C., the approximate date of the “Linyi Text.”

3. *The Art of War* was rapidly accepted as military doctrine in China, reflecting both its efficacy on the battlefield and its harmony with the dominant Taoist philosophy of the era.

4. *The Art of War* has entered the Taoist canon, with standard collections of commentaries dating from before 200 A.D., and has been influential above all other military texts in those regions where Taoism or the related philosophical system of Zen predominate, most especially in Japan.

**Sun Tzu 101**

The time in which Sun Tzu most probably lived, like those that spawned many other great strategic works, was a wonderful laboratory for the creation, testing, and evolution of military ideas. During the aptly named “Warring States” period, China broke into some eight major states and a dozen or so principalities, each of which was attempting to subdue the others by armed conflict. Invasion by one or more neighbors posed a constant threat, so that war truly was, in the famous opening words of the book, the “path of survival and destruction.”

The strategy devised by Sun Tzu fit the circumstances perfectly. Considered broadly, it rested on two major and complementary elements, one internal and one external. Harmony on the inside is The Way (Tao) of war. All else flows from this basic idea, and without it, there is little reason to press forward into the stress of military operations. Externally, Sun’s goal was to create confusion in the opposing side and then exploit it. The focus was not on winning through superior tactics or individual fighting technique (although these are important), but, as Griffith notes, “the enemy commanders must become confused and if possible, driven insane.” His primary tool for accomplishing this was quickness, which helps create ambiguity and also increases the effectiveness of a panoply of tools, such as deception, security, and intelligence, that will be addressed in the following sections.

This strategy differs fundamentally from the core of Western military doctrine, which follows the strategy of Carl von Clausewitz. Clausewitz’s
primary goal was to bring the opposing army to “decisive battle,” and then win it. Sun Tzu wanted to achieve victory in war, but preferably by causing the enemy army to disintegrate before the battle:

Therefore, those who win every battle are not really skillful – those who render other’s armies helpless without fighting are the best of all.\(^\text{15}\)

Although this may not always be possible, it sets a completely different focus on how one approaches the conduct of conflict. As Boyd noted, Clausewitz, even if his strategy is successful, invariably leads to bloody battles of attrition.\(^\text{16}\)

**Sun Tzu and Intelligence**
The final chapter of *The Art of War* deals with use of spies.

So what enables an intelligent government and wise military leadership to overcome others and achieve extraordinary accomplishment is foreknowledge. Foreknowledge cannot be gotten from ghosts and spirits, cannot be had by analogy, cannot be found out by calculation. It must be obtained from people, people who know the conditions of the enemy.\(^\text{17}\)

Far from a throw-away chapter stuck at the end of the book, the section on spies is actually the culmination of the entire work. Sun Tzu makes this clear in the final passage:

So only a brilliant ruler or a wise general who can use the highly intelligent for espionage is sure of great success. This is essential for military operations, and the armies depend on this for their actions.\(^\text{18}\)

Sun Tzu’s commanders are not passive “consumers” of intelligence. A general in the Sun Tzu tradition takes as much personal interest in employing spies as he does in issuing orders to his subordinate commanders. He is as active in intelligence as he is in operations:

Of all those in the army close to the commander, none is as intimate as the secret agent; of all rewards, none more liberal than those given to secret agents.\(^\text{19}\)
To be parsimonious with positions, compensations, or hundreds of pounds of gold, and thereby blind to the enemy’s status, is to be extraordinarily inhumane: such a man can never be considered his people’s commander, can never be his lord’s aide, and can never be the ruler of victory.\textsuperscript{20}

A commander whose primary contact with intelligence is the daily coordinated, scripted, and rehearsed “intelligence briefing” could never be successful in the Sun Tzu school.

\textbf{John Boyd}

The “Sun Tzu School” of strategy continues as an unbroken thread from the Warring States period to the present day. Just the standard collections of commentaries span a period of close to 1,700 years. Sun Tzu is widely studied today in Japan, where one of its most influential strategy texts, Miyamoto Musashi’s \textit{Book of Five Rings} (1645 A.D.) is a direct adaptation of the ideas of \textit{The Art of War} to the military situation of the time.\textsuperscript{21}

More recently, Mao Tse Tung was a careful student of Sun Tzu and gave him full credit for the strategy which allowed his rag tag army to eventually defeat the Nationalists and their Western supporters.\textsuperscript{22} In a very real sense, Boyd represents the most recent major member of this school.\textsuperscript{23} Of all the strategists he considered, and the list includes such luminaries as Clausewitz, Jomini, Bonaparte, Saxe, and most of the other classroom standards, Sun Tzu was the only one that Boyd did not critique in his major work, \textit{A Discourse on Winning and Losing}.\textsuperscript{24}

Boyd is best known for two achievements. He was the first to derive a mathematically coherent theory of air combat, “energy maneuverability,” which for two competing fighters shows precisely which will have the advantage in any flight state (combination of airspeed, altitude, and direction). “Maneuverability” is the ability to change flight states – to climb, for example, turn, or accelerate or any combination thereof. Directly because of Boyd’s efforts, fighter design swung away from aircraft optimized to fly at very high speed in a straight line, such as the YF-12, towards the highly maneuverable aircraft we see today, particularly the F-15 and F-16 in the Air Force and the F-18 variants in the Navy and Marine Corps.\textsuperscript{25}
But perhaps uniquely among major strategists, Boyd found and acknowledged a fundamental shortcoming in his theory and his correction proved to be much more powerful than this original idea (and far more applicable to other forms of conflict, such as business). Basically, there were times when the less maneuverable aircraft won. It is true that for this to happen, both aircraft had to be roughly comparable — that is, the original theory still held in most cases — but there were instances, such as the F-86 vs. the MiG-15 and the YF-16 vs. the YF-17, where energy maneuverability alone did not adequately explain the results. These anomalies led Boyd to the idea of “fast transients,” that is, the ability to transition between maneuver states. He called this ability, “agility.” To give an example: at a given airspeed and altitude, the more maneuverable fighter could make a tighter turn, while the more agile could more quickly change from a (perhaps not quite so tight) turn in one direction to a (perhaps not quite so tight) turn in another:

*The ability to shift from one maneuver to another more rapidly than an adversary enables one to win in air-to-air combat.*

Boyd also made a critical observation, that the pilots of the more maneuverable but less agile fighters often became frustrated while trying to pin down their more agile adversaries, and this sometimes caused them to make mistakes. The pilots of the more agile aircraft could often spot and exploit these mistakes to win a victory. Boyd was a student of military history and this rang a bell. This idea of discombobulating the enemy first and then — and only then — engaging in close combat was fundamental to several earlier strategists, most notably Sun Tzu.

At this point Boyd made his best-known contribution to modern strategy, expanding the concept of “agility” from a largely physical property of aircraft to a largely mental property of competitive organisms in general. He concluded that it is as if the more agile competitor is able to observe, orient, decide, and act more quickly than the other. If he can consistently go through this loop “more inconspicuously, more quickly, and with more irregularity,” which Boyd equated to “operating inside the opponent’s OODA loops,” he will disorient and confuse his opponent precisely as Sun Tzu had mandated. This leap from air-to-air combat to the now famous Observe-Orient-Decide-Act (OODA) loop (Figure 3) and its link to the strategic purpose of Sun Tzu is perhaps the most brilliant insight of strategy in the last 100 years.
Note how orientation shapes observation, shapes decision, shapes action, and in turn is shaped by the feedback and other phenomena coming into our sensing or observing window. Also note how the entire "loop" (not just orientation) is an ongoing many-sided implicit cross-referencing process of projection, empathy, correlation, and rejection.

— John R. Boyd, 1992
Over the course of about 10 years, Boyd evolved an 8-hour briefing, “Patterns of Conflict,” that led viewers to this conclusion. Beginning with Sun Tzu, continuing through the Battles of Marathon and Leuctra (Epaminondas’ classic victory over the then-invincible Spartans in 371 B.C.), visiting Alexander’s conquests, then winding its way finally to the blitzkrieg (particularly against France in 1940) and modern guerilla warfare, Boyd showed that his pattern held, time after time. More agile armies had defeated their larger and technologically advanced opponents with remarkable frequency, and this pattern continues to the present day, most obviously in the Arab-Israeli Wars from 1947 to 1973 and the Vietnam War.

**Boyd and Intelligence**

At first glance, Boyd appears to accord intelligence a much lower status than did Sun Tzu. He has no briefing with “intelligence” (or anything roughly synonymous) in the title, nor is the word in the title of even one of his briefing slides. When it does appear, it is generally in a list with many other items. For example, in “Blitzkrieg: Keys to Success,” the third point is:

> **Intelligence, reconnaissance (air and ground) and stratagem emphasized before and during combat operations to unmask and shape patterns of adversary strengths, weaknesses, moves, and intentions.**

It does not appear at all in any of his major summary charts, such as the “Essences” of maneuver and moral conflict or the “Pattern for Successful Operations.”

Even a cursory glance at Boyd’s OODA Loop Sketch, however, shows that Boyd regarded intelligence in the broadest sense no less highly than Sun Tzu. Boyd constantly emphasizes the importance of open systems, and the only opening into the OODA loop is through Observation. If one fails by whatever means to spot mismatches between what one believes to be going on and what really is, (i.e., between Orientation and the real world), one has become “mentally isolated.” If an adversary can keep us in this state – perhaps by operating inside our OODA loops – then as setback after inexplicable frustration befall us, we will become disoriented, confused, indecisive, fearful, etc., and a competent enemy will be able to create, locate, and exploit vulnerabilities leading, in the case of maneuver warfare, to frequent envelopments, ambushes, high prisoner counts or, as Boyd put it, “any other phenomenon
that suggests inability to adapt to change.”30 This explains, by the way, why ill-treatment of POWs cannot be tolerated: A battlefield commander should want them to surrender, and needs to make it as easy as possible.

Interested readers can download Boyd’s major briefings at Defense and the National Interest, http://www.d-n-i.net.
Role of Military Force

Although Sun Tzu is best known for his admonition that “To win without fighting is best,” the subject of this sentence and of The Art of War is “To win.” Whether used to fight or for some other purpose, Sun Tzu placed a high premium on the utility of military force. The opening of The Art of War simply states that:

Military action is important to the nation – it is the ground of death and life, the path of survival and destruction, so it is imperative to examine it.

Sun Tzu does not directly address the place of military activities in advancing the larger national interest, perhaps because the answer was obvious in an era known as the “Warring States.” The actual name of the book in Chinese suggests this focus: Sunzi bingfa, or Sun Tzu’s Principles for Using Forces.31 However, Sun Tzu’s book is firmly in the Taoist tradition on the use of violence. The fundamental text of classical Taoism, the Tao Te Ching (c. 500 B.C.), states that, “Weapons are the tools of fear. A decent man will avoid them, except in the direst necessity.”32

Some may argue that we have now swung to the opposite extreme. Is the entire study of war obsolete? The age we are in is hardly the first in which many people seriously believe that large-scale war lies entirely in the past. As late as 1913, educated commentators were proclaiming war in Europe impossible because either the bankers would not finance it or the workers of the world would refuse to take up arms against their brethren. While this paper will accept that the survival of the United States is not jeopardized by a replay of World War II, legitimate security concerns remain.
Threats to U.S. National Security

First, there are still thousands of nuclear warheads in the Former Soviet Union (FSU), and some number of these are mounted on delivery systems still capable of propelling them onto U.S. soil. However, the U.S. strategic position relative to the states of the Former Soviet Union is much better than it was to the real Soviet Union, and since it is not clear that an “exchange” of nuclear weapons constitutes war, the goal of which is survival on the nation’s own terms, this paper will not address major changes to U.S. strategic posture.

The only other direct military threat to the United States proper could come from the emerging nuclear states, including China, India, Pakistan, Israel, and potentially Iraq, Iran, and North Korea. This paper will consider what Sun Tzu and Boyd might have done about this threat.

There are also still circumstances that, although not directly threatening United States territory, could call forth a significant military response. Most likely, perhaps, would be another large-scale attack against a country that the U.S. considers a “vital national interest.” As will be noted in the next section, both Sun Tzu and Boyd urge caution, since there are potentially an unlimited number of these and in most cases military force is only one tool at our disposal.

U.S. forces may also become engaged to protect areas considered inviolable by politically influential blocs, Israel and Taiwan come immediately to mind, and as population demographics change, others may be added. In the latter two cases, U.S. forces could face anything from a large-scale conventional attack – a replay of Desert Storm – to what is being called “fourth generation warfare” (4GW). This term basically describes any way of dealing with U.S. military forces other than confronting them on the battlefield. It includes all forms of terrorism, guerilla warfare, intifada-type urban unrest – sometimes financed by relationships with criminal or narcotics networks – and others that will evolve.

As Dr. Grant Hammond of the Air War College notes, 4GW is not just guerilla warfare under another name:

Perceiving war as a contest marked by the use of force is a woefully incomplete, tragically simplistic, and fundamentally flawed view … a future war among industrialized states, even if effective and efficient, could be virtually invisible.
The threat of major conventional war – or even more remotely that the leadership of some “rogue” state will commit suicide by attempting to lob their one working nuclear device in our direction – is insignificant compared to the certainty of 4GW. As General Charles Krulak, a former Commandant of the Marine Corps, has noted, “We need to watch for the ‘Stepchild of Chechnya’ vice the ‘Son of Desert Storm.’”

In true 4GW, distinctions between civilians and combatants blur, so an enemy might seek to counter an F-22 by poisoning the squadron’s mess hall, blowing up its barracks (as in Beirut), or even attacking schools and PXs back at the base. Fourth generation warfare, while indeed highly “asymmetric,” is not the same as “asymmetric warfare,” since maneuver warfare is also “asymmetric” and calls for creating and exploiting enemy weaknesses, rather than engaging and trying to reduce his formations and fortified positions directly.

This is not meant to be a complete list of the possibilities for using U.S. military forces, but should illustrate that since the resort to armed conflict is still the ultimate arbiter of disputes, the United States will have no shortage of opportunity to participate. Indeed, as of Jan. 1, 2001, the Center for Defense Information lists nearly 40 “major active conflicts” around the world, any one of which could be the spark for commitment of U.S. military forces.

Survival of the United States does not have to be the issue; survival of the current political leadership will suffice.

**Sun Tzu and Boyd on the Utility of Military Force**

Sun Tzu recommends two options as superior to battle for using military force to triumph in war. The best way to defeat an enemy is by “attacking his strategy.” The commentators differ on what this means. One school insists that it simply means to attack early, while the enemy’s plans are being laid. Others find a deeper meaning, to employ unusual methods to “seize victory without even battling,” which seems more in harmony with the maxim that “to win without fighting is best.”

Should this prove impossible, Sun Tzu then recommends disrupting his alliances. Again, the commentators fail to agree, with some saying that it means to attack early, before the enemy can solidify his alliances. Others suggest it means isolating potential enemies from sources of support, or intimidating them through strong alliances of your own. Again, this latter interpretation seems more in line with the rest of the book.
Boyd takes a similar, but broader approach. He begins “Patterns of Conflict” with an observation on human nature, that we strive to:

*Survive, survive on own terms, or improve our capacity for independent action.*

*The competition for limited resources to satisfy these desires may force one to:*

*Diminish adversary’s capacity for independent action, or deny him the opportunity to survive on his own terms, or make it impossible for him to survive at all.*

It is important to notice that Boyd uses “may” rather than “will,” leaving open the possibility of resolving the competition for resources without forcing these alternatives on one’s adversaries, or making them adversaries at all. Even if diminishing, denying, or eliminating an adversary should become necessary, he does not mandate war and certainly not armed conflict as the only method. However, he leaves the possibility open, as well as the possibility that resort to arms is what the adversary will choose.

In fact, Boyd is insistent that the use of armed force must be carefully thought out so that it does not cause more problems than it solves. For this, he expands on Sun Tzu’s first two courses of actions through his concept of “grand strategy,” which serves to:

1. Support national goals.
2. Pump up one’s own resolve, drain away the adversary’s resolve, and attract the uncommitted to one’s cause.
3. End the conflict on favorable terms.
4. Ensure that the conflict and peace terms do not provide the seeds for (unfavorable) future conflict.

He then summarizes his argument to this point in a hierarchy, starting with the primary national goal (“Improve our fitness, as an organic whole, to shape and cope with an ever-changing environment”), and working down through various levels of strategy to tactics. Careful examination of this hierarchy shows that the phrases “military force,” “armed conflict,” or even “war” are not mentioned at all. The resort to such methods is just one tool for accomplishing Boyd’s grand scheme, and the strategy and tactics of “Pat-
terns of Conflict” do provide a guide for using them – when necessary – in harmony with the grand strategy outlined above.

In summary, neither Boyd nor Sun Tzu saw war as the solution to all of humanity’s problems, or even that armed conflict was the best way to prosecute war once it had become necessary. Both would agree that the goal of war, once it is unleashed, is more than just to achieve victory, but to accomplish it:

- In the shortest possible time.
- At the least possible cost in lives and effort to one’s own side.
- With the infliction on the enemy of the fewest possible casualties.42

**Contemporary Justifications for Military Forces**

Today, one finds many justifications for U.S. military force, all of which can be included within three broad categories:

1. Defend the homeland from attack.
2. Enforce a “Pax Americana.”
3. Protect vital U.S. interests abroad.

Most Americans would agree on the legitimacy of defending U.S. territory from attack, although there is an argument over defense against what – does the United States need a national missile defense, for example – and against whom (just foreign militaries, or should narcotics traffickers, or illegal aliens be included)? The debate becomes truly heated when other uses of military force enter the equation.

“Pax Americana,” for example, refers to the idea that as the sole remaining superpower, it is in the best long-term U.S. interest to intervene militarily to ensure peace and stability anywhere around the world, that it is better to stamp out brushfires than fight major conflagrations.43 A recent RAND study concluded that “We learned [in the last decade] that American economic and military strength is as important as ever and that much of the world still depends upon us to be engaged – and to lead.”44 A former secretary of the Navy insists that since the end of the Cold War, the United States has become the “linchpin of security” in Europe and Asia.45

Most Americans would agree with the goal of creating a safer, more peaceful world. The real issue is whether such an objective should guide the sizing and organization of U.S. military forces. On the surface, this seems to have support from Sun Tzu, since he noted that, “the superior militarist strikes
while the schemes are still being laid.” However this observation is really advice on how to conduct operations once the decision to do so has been made. It does not address the larger question of the role of military operations in national policy. The *Tao Te Ching*, however, takes the problem on directly:

*If a nation is centered in the Tao*

*if it nourishes its own people*  
*and doesn’t meddle in the affairs of others*  
*it will be a light to all the nations of the world.*

It is probably redundant to note that this advice was widely ignored during the ensuing Warring States period. And the U.S. government’s ignoring of it in Vietnam produced entirely predictable effects, which are a hallmark of fourth generation warfare:

*Both the French and the Americans, not to mention the Saigon regime itself, resorted to force because of the unassailable supremacy of the Communists in the political arena. All three learned (or should have learned) that force by itself was inappropriate, because the application of force made the political appeal of the insurgency all the greater. The harder they tried to win the war, the more disruption they caused, and the more remote victory became.*

The other problem with enforcing worldwide peace is that it is a large job. Many of the 40 major armed conflicts active in the world involve longstanding ethnic or tribal disputes. It is not clear how entry of U.S. armed forces would resolve them. This suggests a policy of selective intervention, which is usually phrased as “protecting U.S. vital interests.” The current U.S. administration ran on a platform that would embrace such a policy, and even suggested it would rethink the U.S. role in the Balkans since it saw no “vital interests” in that area.

As with the Pax Americana, most Americans would probably agree with the idea that the United States should employ its armed forces to protect vital interests. However, in a sense this is a tautology since “vital interests” are precisely those that would justify armed military intervention. For sure, U.S. leaders will commit enormous forces to protect such things as access to crude oil, and given the dependence of the U.S. economy on imported resources, practically any part of the world could become a “vital national interest” in the future.
To make “protection of vital interests” useful for creating forces, however, the United States would have to determine in advance what its specific vital interests are. There are at least two major problems one runs into when attempting to put this idea into practice. First, “vital interests” change and often faster than weapons or forces can. Who, as late as 1994, would have thought that Bosnia-Herzegovina and Kosovo would have represented “vital American interests”? Because development cycles for major weapons often exceed one human generation, the United States will protect its vital interests with the forces it has, or even select these interests based in part on what the forces can do.51

The other problem inherent in the vital interests approach to force creation is the range and sheer number of potential areas and scenarios that could involve “vital interests.” During the Cold War this was not a severe problem, since for 45 years the Soviet Union and its allies provided a clear focus for determining national interests. Today, the range extends from incidents, such as rescue of U.S. citizens, to assisting allies (especially those with sizable voting diasporas in the United States) in everything from terrorism and guerilla warfare to repelling a conventional attack to a “major theater war” against some as yet undetermined, but large and capable, conventional opponent. It follows that potential theaters of operations could range from desert to jungle to teeming Third World metropolis.

If one were to make an explicit list of vital areas, however, doesn’t this suggest a carte blanche for others elsewhere? Many historians argue that the Korean and Gulf Wars began precisely because the United States had indicated that South Korea and Kuwait lay outside its vital areas. Even if the U.S. government doesn’t publicize its list (and for once, secrets remain secret), any adversary worthy of the term can look at the forces the U.S. military has, along with basing and treaty structure, and infer what the United States considers “vital.”

In summary, it would seem that using “protection of vital national interests” as the primary rationale for sizing U.S. military forces quickly and logically transforms into the Pax Americana. The only ways out would be for U.S. leaders to convince themselves that they can indeed predict the future, or to announce in advance that the United States is writing off the “non-vital” areas of the world. One of the purposes of this paper will be to offer an alternative that does not suffer from these defects.
Military vis-à-vis Other Options

After the events of the 20th Century, few would argue that the world has entered an Aquarian Age of peace, love, and universal respect for human rights. And the world is not short of people who might view the United States as an impediment to surviving on their own terms or those of their nation, ideology, or religion. As Secretary of Defense Donald Rumsfeld has noted, “History shows that weakness is provocative,” and there is nothing in either Sun Tzu or Boyd to contradict this assessment.

The real issue is: What should be the role of the military in protecting U.S. interests, in conjunction with other tools for advancing national goals? Some argue that the end of the Cold War made the world more unpredictable, and so the United States must now increase reliance on the military to protect its national interests. Former Secretary of Defense James Schlesinger, for example, has called for a 20 percent increase in the defense budget, noting that, “Recent events in the Middle East should underscore that we are living in unpredictable and even dangerous times. A strong military is a bulwark against threats to U.S. vital interests and to our homeland.” Columnist Charles Krauthammer simply tells the rest of the world to bend to the U.S. will, or else.

Other commentators, such as Daniel Gouré of the Lexington Institute, suggest that the United States already relies too heavily on the military aspects of securing national interests:

The experiences in the Balkans, Chechnya, East Timor and elsewhere have shown the limited capacity of the major powers to deploy forces relevant to keeping the peace and rebuilding states shattered by civil war.

Civil affairs capabilities have proven to be almost non-existent. Keeping the peace requires soldiers to act like policemen, a job for which they are ill-prepared and ill-equipped. Yet, an effort to create an international police force for Bosnia and Kosovo has stalled. The scarcity of engineering units has also restricted efforts to rebuild civil infrastructure.

The West’s decidedly mixed record in managing these new crises nevertheless shows well in comparison to that of other developed countries such as Israel and Russia. Israel, possessing the world’s premier conscript-based army, still finds its vaunted military superiority of little use in the face of sophisticated unconventional threats.
Even a cursory glance at world opinion suggests that Gouré is correct. It should not be too surprising that many Third World countries resent the U.S. ready resort to military power:

*Clearly, the U.S. is rushing to court unpopularity across the world, contrary to expectations that the Bush national security establishment would conduct itself with a degree of sophistication. There is little sign of the maturity, balance and sobriety expected of the ‘reluctant warrior’ Colin Powell … The U.S. policy in the first month of President George Bush is suggestive at once of a lack of coherence and hegemonic arrogance. Only time will tell whether this is disorientation caused by the GOP’s eight years out of office or this is the U.S. as the new cowboy on the rampage. The Bush administration has possibly set a record for alienating so many nations in such a short period.*

And perhaps U.S. policy-makers can shrug off the warnings of former Soviets, like Mikhail Gorbachev:

*I would go even further and say it is time for America’s electorate to be told the blunt truth: that the present situation of the United States, with a part of its population able to enjoy a life of extraordinary comfort and privilege, is not tenable as long as an enormous portion of the world lives in abject poverty, degradation and backwardness … Instead of seeing an increase in U.S. security, the end of the Cold War has seen a decline. It is not hard to imagine that, should the United States persist in its policies, the international situation will continue to deteriorate.*

But U.S. willingness to see force as a desirable way to solve many of the world’s problems even disturbs many fellow Westerners:

*Having conned world opinion into a false belief on the scale of Serbian atrocities, operating without legal sanction and having made a diplomatic resolution impossible, Clinton and Blair started the air bombardment on March 24th, 1999. Almost certainly more people were killed in the bombardment than in the Serbian campaign it was intended to deter.*
We perhaps forget the lesson of the *Tao Te Ching*, that any use of “power,” even (especially) if it is successful, breeds resentment and may plant the seeds of future conflict.

Boyd and Sun Tzu both insisted that to be most effective, the military option must be integrated within the entire collection of tools available, and because it involves physical destruction and death, be used sparingly. In the present circumstances of the United States, these other tools include:

Diplomacy, which Sun Tzu considered second only to attacking an adversary’s strategy as a means of waging war. Boyd placed a high premium on diplomacy as the operational element of grand strategy, with the goal of isolating opponents from not only physical support, such as re-supply, but from the moral and mental (including informational) interactions necessary to keep their populations united and to make rational assessments of the situation.58

Economics, which although much maligned, can shut down the internal processes of all but the most primitive countries. To be effective, of course, it must be combined with diplomacy as a component of grand strategy.

Adherence to national ideals. Attracted by democracy and the free market system, millions of people every year attempt to enter the United States, some at the risk of their lives. By contrast, relatively few people are venturing thousands of miles to break into North Korea, Iraq, or even China in order to participate in the high quality of life these places offer. Any adversary attempting to mobilize his population to fight against the United States has to contend with the fact that a sizable fraction of them would likely prefer to be on the other side. Some tens of thousands of Chinese students, for example, study at U.S. colleges and universities and thousands more work for American companies. All of these experience to some degree to our ideals and freedoms. One of the main themes of Boyd’s grand strategy is to increase the numbers of these people as much as possible before hostilities begin. When the shooting starts, the U.S. military would rather face Iraqi peasant levies that lined up to surrender to reporters than North Vietnamese or Viet Cong main force units that did not.
As a former director of the Defense Intelligence Agency put it:

*Formulating a contemporary strategy that has political, economic, cultural and functional substance, as well as a liberal amount of public understanding and support, must be the goal.*

To summarize, the United States will undoubtedly use military force to protect what it considers vital national interests of the moment. Ideally, such force should be used as one component of a careful strategy for realizing these interests and that when it is used, it should conform to Sun Tzu’s three criteria (p. 29) and Boyd’s grand strategy. However, the national interests approach is only marginally useful for creating forces, since it requires planners to make fairly specific predictions about what these interests will be, where they will be threatened, and what type of adversary will be confronted. Because these predictions must be made decades in advance, they would, in the best case simply prove irrelevant, and they could telegraph the chosen national strategy to potential opponents.

This raises the question, if not “protect vital interests, then what?” What is needed is an approach that will provide effective forces when called for, but which does not require accurate predictions of the future. The concepts advanced by Sun Tzu and John Boyd provide a resolution to this dilemma by stepping up one level and asking, “Regardless of the specifics of how they will be used, what makes military forces ‘effective’ in general?” If the United States creates forces along these lines, and equips and trains them for maneuver conflict and 4GW, then operating in conjunction with allies and using the other tools for advancing vital interests, it can field an effective and affordable military force.

**Peacekeeping**

The United States has historically not considered “peacekeeping” as a criterion for creating and sizing forces. The same group of forces – about 10 percent of the Army, for example – make multiple deployments to places like Bosnia and Kosovo, while the rest do not go at all. In other words, the United States has plenty of forces, it is just not making effective use of what it has.

In the initial stages of a peacekeeping operation, military forces may be needed to engage hostile military forces before true peacekeeping can begin. This is a standard use of force and presents no conceptual problems, since the
primary mission of the military is to defeat opposing armed forces by death and destruction if necessary. This is what they study, equip, and train for. People are promoted (or should be) for their proficiency as war fighters and leaders of warriors. It is generally considered a full time occupation, and even reserve forces usually require refresher training, especially at the unit level, to prepare them to engage in it.

Whether military forces should be engaged in peacekeeping duties after any hostile military forces have been eliminated is a subject for more serious debate. In true peacekeeping, the mission is protection, not destruction. It is more akin to policing than to soldiering, and uses of force must be very carefully controlled. In fact, one of the largest threats to effective peacekeeping is the orientation that the underlying problems can be solved by application of force. This mindset can be reinforced if it seems that armed military groups cannot be quickly eliminated or, as in Somalia, that they keep reappearing after a successful initial stage. Such a situation could indicate that the armed groups enjoy wider support among the population than originally thought – that U.S. forces are engaging in fourth generation warfare without knowing it – and so the venue is not ready for “peacekeeping” at all.

For all of these reasons, national leaders should study the peacekeeping problem very carefully. They should consider removing the mission from the military and placing it somewhere else, in an organization that equips, develops doctrine, and trains for that mission and not for war. For reasons of grand strategy, it could be a multinational, permanently organized “unit” with U.S. allies to which the United States contributes resources other than combat troops. It is not that the American military cannot perform peacekeeping, but that for their own war-fighting good, they probably should not.
What Makes a Military Force “Effective”? 

Sun Tzu’s and Boyd’s Perspective

Sun Tzu lived and waged war at least 2,500 years ago. What, one might reasonably ask, could one learn from the era of chariots and crossbows that would prove even the least useful for building effective forces in the age of missiles, satellites, and information warfare? The first pages of The Art of War provide the answer: Sun Tzu was not concerned with the type of hardware in use. He focused on the problem of how to get groups of people to work together harmoniously under conditions of hardship, danger, and the inevitable confusion of conflict. This question applies just as surely to conflict today as it did during the Warring States Period, and it applies to all forms of conflict, including business, politics, and sport.

He begins with the political leadership. Before envisioning conflict with another state, the ruler and his immediate advisors must survey and compare five factors:

1. Which leadership has the Way? The “Way” (Tao) means harmony among people, so that the people and the leadership are united in purpose to overcome fear of danger.
2. Is the terrain favorable?
3. Is the weather likely to be favorable?
4. Which side’s generals are the more capable? The political leadership must make objective comparisons of such factors as humaneness, intelligence, trustworthiness, courage, and sternness.
5. Which army’s doctrine and discipline is superior? Here the leadership must consider organization, control, assignment of appropriate ranks to officers, regulation of supply routes, and provisions.\(^{60}\)
Only if these comparisons are favorable should the political leadership proceed to the next level of analysis, which deals more specifically with force effectiveness. The key point is that three of the five, and the most significant three, since weather will change and terrain and weather affect both sides, concern moral, human, or cultural issues. This is the dominant theme of Sun Tzu, and will be repeated many times as he discusses military forces. Griffith sums up The Art of War in precisely these terms:

Sun Tzu believed that the moral strength and intellectual faculty of man were decisive in war, and that if these were properly applied, war could be waged with certain success.61

As an aside, there is nothing in Boyd to contradict this statement. Sun Tzu then proceeds to enumerate seven factors, related to the five elements above, to guide planning:

1. Which ruler has the Way? The Way, in this sense, includes unity of purpose between the ruler and the population and other factors, such as the ability to clearly perceive the true situation (which includes the ability to make these comparisons).
2. Which commander is the more able? Consider the factors previously noted: intelligence, trustworthiness, bravery, humaneness, and sternness.
3. Which army can better exploit the advantages of climate and terrain?
4. Whose troops are the stronger?
5. Whose discipline is more effective? In which army are regulations and instructions better carried out?
6. Whose officers and soldiers are better trained?
7. Whose system of rewards and punishments is clearer?62

In the very next passage, Sun Tzu claims that these seven factors form an infallible guide to victory.

When a general who heeds my strategy is employed he is certain to win. Retain him! When one who refuses to listen to my strategy is employed, he is certain to be defeated. Dismiss him.63

Later in the book, he restates these with a slightly more tactical (i.e., who will win the next engagement) flavor:
1. Those who know when to fight and when not to fight are victorious.
2. Those who know when to use many or few troops are victorious.
3. Those whose upper and lower ranks have the same desire are victorious.
4. Those who face the unprepared with preparation are victorious.
5. Those whose generals are able and not constrained by their governments are victorious.

Given two alternative military systems, it follows that the “more effective” is the one that rates higher on these scales. Sun Tzu does not give any advice on performing this calculation. As Griffith notes, it was a rational process, although it relies on a number of subjective judgments, but nothing is known about how to conduct this “defense review.” Do the various elements trade-off so that, for example, weaknesses in the system of rewards and punishments could be offset by superiority in the training program? One suspects that this type of sophistry would have little appeal to Sun Tzu. Leaders should improve weaknesses wherever they exist, and the final calculation rests heavily on the experience, intelligence, and intuitive understanding of the commander and the ruler. In fact, success in conflict depends on one’s ability to perform these calculations and, in particular, not to deceive oneself.

Again, it should be noted that superiority in hardware is not mentioned at all. Sun Tzu is rating the effectiveness of the entire force. Sun Tzu and the commentators do not advise the ruler to spend considerable effort on trying to develop harder iron or more powerful crossbows or to more rapidly adapt the new “revolutionary” technology now known as gunpowder to military use. It may be that all the warring states were roughly equal in technology, and that, because of migration and economic factors, it would have been impossible for one state to have developed and deployed a novel technology in sufficient force to have had a decisive effect. Or it may simply have been that in the hierarchy of force effectiveness, technology rated well behind the seven factors outlined above.

**Boyd on Force Effectiveness**

In their writings on strategy, neither Boyd nor Sun Tzu assessed individual weapons or categories of weapons. This is a critical point, since Boyd spent the majority of his Air Force career either flying or developing fighter aircraft. He obviously had strong feelings on the issue. Other than his observa-
tion about agility in fighters (p. 21), however, and a general remark about complexity, he gives no advice on selecting hardware. What he does consider are military forces, that is, combinations of people, ideas, and hardware. In this scheme, “people” includes all the normal personnel issues of selection, retention, and promotion, as well as the various “moral” forces that hold units together during the stress of combat. “Ideas” include both doctrine and those concepts that are widely shared but are not written down.

Not that weapons are not important, but his study had shown that time and again, the smaller or less technologically advanced force could win, whereas there are relatively few instances where technology or size alone was able to overcome deficiencies in people or ideas. Thus Boyd would insist on “People, ideas, and hardware – in that order!” As he examined why this was the case, he synthesized four factors that he called an “organizational scheme for operational success,” and although the elite units of the German army in 1940 provided the initial catalyst, he noted their presence in successful forces from Sun Tzu down to the modern Israeli Army (at least until 1973).

Boyd’s scheme is:

• **Mutual trust; unity.** Very similar to *The Way* in Sun Tzu’s list of factors.

• **Intuitive competence,** at all levels from private to general. In addition to proficiency with weapons at the individual level, “intuitive competence” also applies at the command levels, where it refers to the “feel” great commanders have for the progress of the battle, and in particular to their seemingly uncanny abilities to detect and exploit openings while they still present opportunities. Comes from years of practice at ever-increasing levels of complexity. The Germans called it *fingerspitzengefühl,* literally “finger tip feeling” and it implies such a high level of competence that decisions can be made without hesitation. Perhaps similar to the Zen notion of action without a “sticking mind.”

• **Mission orientation.** The Germans called this *auftragstaktik.* The basic idea is that commanders and subordinates enter into a type of contract where the subordinate agrees to fulfill the commander’s intent, while the commander agrees to give the subordinate wide latitude on how this is done.

• **Focus and direction.** Related to the concept of “commander’s intent.” It often refers to a specific unit and its mission. All other units must
make their activities support the fulfillment of this unit’s mission. Depending on the progress of the operation, the commander may shift this role to another unit and another mission.\textsuperscript{70}

Boyd’s insight was that organizations that operated along these lines would naturally generate higher OODA loop speeds and more irregular ways to employ them. From his study of history, Boyd concluded that such units could:

- Employ a variety of measures that interweave menace-uncertainty-mistrust with tangles of ambiguity-deception-novelty as a basis to sever the adversary’s moral ties and disorient him.
- Select the \textit{initiative (or response) that is least expected} [note: not necessarily the one that has the highest predicted effectiveness, since the enemy can perform these calculations, also].
- Establish focus of main effort together with other efforts and pursue directions that permit many happenings, offer many branches, and threaten alternative objectives.
- Move along paths of least resistance (to reinforce and exploit success).
- Subvert, disorient, disrupt, overload, or seize the adversary’s vulnerable, yet critical, connections, centers, and activities in order to dismember organism and isolate remnants for later mop-up.
- Generate, uncertainty, confusion, disorder, panic and chaos in order to shatter cohesion, produce paralysis and bring about collapse.\textsuperscript{71}

We find many echoes in Sun Tzu:
- Take them by confusion.
- Throw them into disarray.
- Cause division among them.
- Victory is gained by surprise.
- Take away the heart of their general.

So an effective force in the Boyd paradigm is organized in harmony with the four principles of his organizational scheme, and, as a result, can operate with very rapid, inconspicuous, and irregular OODA loops to create and exploit opportunities.
Cheng and Ch’i

Both Boyd and Sun Tzu place great emphasis on the interplay between the expected and the unexpected, also known as the pinning/distracting and the decision forces, the orthodox and the unorthodox, or by Sun Tzu’s original terminology: cheng and ch’i. This is a tool of strategy available to those who operate inside their opponents’ OODA loops. Again, it applies to the force (people-ideas-hardware) rather than to any particular component alone.

As for the importance of cheng / ch’i, Sun Tzu notes that:

Making armies able to take on opponents without being defeated is a matter of unorthodox (ch’i) and orthodox (cheng) methods … The unorthodox and the orthodox give rise to each other like a beginning-less circle – who could exhaust them?

Several points can be inferred about force effectiveness. First, it does not come from the predicted effectiveness of the force, and particularly not from the predicted effectiveness of individual weapons, or even in combination. Part of the genius of Sun Tzu and Boyd lay in their abilities to assess a force without predicting how effective it would be. This seeming contradiction hinges on the idea that the actual performance of the force in the field depends on the enemy’s actions, which cannot be predicted. However, by considering the complete forces on both sides, that is both people-ideas-hardware combinations, one can assess which force is more capable of carrying out the Boyd/Sun Tzu strategy, thereby leading to certain victory.

All predictions of effectiveness must assume some pattern of enemy activity, even if it is just “stand there and be shot” (or “serviced” in today’s terminology). By definition, then, the enemy is behaving as predicted and so all “modeling” is clearly cheng. True war-winning effectiveness comes from the force’s ability to play the cheng / ch’i game, that is, to set up the opponent, then quickly shift to something he does not anticipate, and then to exploit to the fullest the resulting confusion.

So the rule of military operations is not to count on opponents not coming, but to rely on having ways to deal with them; not to count on opponents not attacking, but to rely on having what cannot be attacked.

A key element of both Sun Tzu’s and Boyd’s strategy was to “drive the opponent crazy” before actually committing military forces. Isolation in all
forms – particularly diplomatic and economic – is an effective tool for accomplishing this. As Boyd concluded in “Strategic Game of ? and ?” on a slide entitled “The Art of Success”:

_Morally-mentally-physically isolate our adversaries from their allies and outside support as well as isolate them from one another in order to magnify their internal friction, produce paralysis, bring about their collapse and/or bring about a change in their political / economic / social philosophy so that they can no longer inhibit our vitality and growth._

As noted previously, the goal of “morally-mentally-physically isolating our adversaries from their allies and outside support” is one of the primary objectives of grand strategy. For the purpose of protecting vital national interests, effective military forces would harmonize with those of allies, help enforce diplomatic and economic efforts to isolate adversaries, and end any recourse to armed conflict in accordance with the criteria of Sun Tzu, which are worth repeating:

- In the shortest possible time.
- At the least possible cost in lives and effort to one’s own side.
- With the infliction on the enemy of the fewest possible casualties.

In keeping with Boyd’s concept of grand strategy, this would not only attract the uncommitted to one’s own side, but also make it easy for the “conquered” population to resume normal diplomatic and trade relationships after the conflict has ended.

To summarize, in Boyd’s view of conflict, an effective force would typify the four elements of his organizational scheme, and so be able to operate with quick, inconspicuous, and irregular OODA loops. Such a force would be employed as a component of an overall national strategy in ways that reinforce alliances and that end the conflict without sowing the seeds of the next one. Since the specific tactics to be used depend on the actions of the enemy, they cannot be specified in advance. However one can note that drawn out campaigns tend to strain both alliances and U.S. domestic support, and what is seen as gratuitous destruction alienates support in the United States, among allied countries, and within those groups in the target society that would support the U.S. cause.
Other Concepts of Effectiveness
As noted, Boyd and Sun Tzu describe how an effective force should operate, using concepts like the seven factors, cheng / ch’i, and the ability to operate with quick/inconspicuous/irregular OODA loops. There are other ways of assessing force effectiveness, of course. Perhaps the simplest is spending level – that if a country spends more on defense, it must be buying more defense, that is, that it has more effective forces. Although stated in this manner, such a position seems simplistic, the idea lives on in the recent wave of suggestions that the defense budget be pegged at an arbitrary percentage of gross domestic product (generally to 3.5 percent or 4 percent). The idea apparently is that strength is a direct function of spending. This is not necessarily as simplistic as it first appears; it does not mean that these people agree with Caspar Weinberger, that if you’re spending more, you must be getting more. It does suggest, however, that they do believe that current U.S. defense problems can be alleviated by spending more and only by spending more. Fence off the money, then argue over what to spend it on.

There is a related concept, however, that states that if U.S. leaders are dissatisfied with current defense posture, any reasonable solution will involve increased spending. This position has a number of sophisticated observers behind it, including at least two well-respected secretaries of defense.77 These commentators often point to what they call a “decade of neglect,” when the U.S. military bought few new systems to replace those left over from the Cold War. As a result, the average ages of U.S. forces are increasing and the technology they are based on is becoming obsolescent.78 Typically left unstated, however, is the fact that forces shrank dramatically after the Cold War. The services had little need to continue buying fighters, tanks, and other systems designed in the 1970s, and opted instead to develop (and wait for) their replacements. This lack of a steady annual procurement caused our current aging problem.

Unfortunately, the new systems tended to be vastly more expensive than their predecessors (in the case of the F-15, replaced by the F-22, more than twice as expensive, counting research and development) and take longer than planned to develop. As a result, the force-aging problem will only get worse. And the requirements for many of the new systems date to the 1980s, so they are still very much “Cold War” weapons.
Related to the belief that more money buys more effectiveness is the notion that more “technology” equals more effectiveness, regardless of whether the military faces Soviet-style armored divisions or guerrillas in the jungle:

Reforming the U.S. military to counter these and other so-called “asymmetrical” threats will require massive investment in research, development and procurement of state-of-the-art technology.\(^7\)

This puts hardware explicitly first in the hierarchy of effectiveness, and is seen in the Bush administration’s goal of “skipping” a generation of technology. It is also evident in service justifications for equipment, which almost suggest that the human is merely along for the ride:

\textit{The F-22 is also at ease operating above 50,000 feet – well beyond the reach of many SAMs. In some cases, the best departure route may be right over the heads of the defenders … As the enemy aircraft try to escape his missiles, the F-22 pilot either prepares for a second shot, moves on to new targets, or heads out of the danger zone. His Advanced Medium-Range Air-to-Air Missiles need no further guidance and autonomously find and destroy intended targets. The F-22 will be able to carry six compressed-carriage AIM-120C AMRAAMs in its belly.}\(^8\)

As previously noted, neither Sun Tzu nor Boyd rated technology this highly, and there are several potential reasons why. The first is that it is very difficult to find historical support for holding technology in such esteem. There are simply too many cases where the side with the higher technology lost. Vietnam again springs to mind. It often surprises people to learn that in World War II, the Germans tended to win when their technology lagged behind the Allies (as during the 1940 blitzkrieg against France) and lose during the era of wonder weapons. The V-2s rained down on London as Allied tanks were rolling across Europe. Fifty years later, Somali tribesmen blasted high-tech U.S. Blackhawks out of the Mogadishu skies with weapons that would have been quite familiar to the Germans of the blitzkrieg.\(^8\)

The second potential reason why “technology” may not equal “effectiveness” involves the difficulty of determining, in advance, what technology will prove effective. To illustrate, look at the hurdles aviation technology has to overcome in order to prove effective in shaping and supporting operations on land:
1. The technology must physically work and work reliably enough to be effective. That is, it must locate, identify, and destroy enemy forces, sometimes in close contact with our own forces, whether they be in desert, jungles, or cities.

2. It must overcome efforts by the enemy to counter it directly. This means that the system(s) must be able to achieve their acceptable level of effectiveness despite efforts by potential adversaries to defeat it – through hardening, decoys, signature reduction, or other methods that we may not discover until we actually engage in combat. Given the development cycles of U.S. weapons, potential opponents have plenty of time to figure this one out.82

3. Potential enemies must not be able to indirectly counter it by attacking the deploying platform, if any. Conversely, its effects on the deploying platform should be minimal, that is, it should not increase its signature, decrease its performance, or require it to operate in such a way as to make it more vulnerable. Early Maverick air-to-surface missiles, for example, required the attacking aircraft to maintain line of sight to the target until the missile could obtain a lock-on. This also includes attacks on wherever the deploying platform is based.

4. It must prove tactically robust. That is, it must withstand efforts by the enemy to render it irrelevant or to degrade it by, for example, engaging in more frequent but shorter attacks that have ended before the new technology arrives.

One might notice that all four of these hurdles are assumed away in the F-22 justification above (“His Advanced Medium-Range Air-to-Air Missiles need no further guidance and autonomously find and destroy intended targets.”) In a sense, this represents a type of intellectual arrogance. The U.S. military is informing potential enemies at least five years in advance and daring them to do something about it. Sun Tzu emphasized that such fables are unnecessary and even misleading, primarily because one cannot predict what opponents will do:

*The victory of a military force is determined by the opponent.*

*The ability to gain victory by changing and adapting according to the opponent is called genius.*83
There are many examples of new technology failing to have its intended effect because either the people factors or the doctrine were not ready to use it effectively. Cambrai is not one of the decisive battles of World War I precisely for this reason. In fact, it was the Germans in the next war that successfully integrated the tank with their largely existing organizational climate and infiltration tactical doctrine to produce the blitzkrieg.\textsuperscript{84}

This is not to say that technology has no role to play in improving tactical aviation for maneuver warfare and 4GW. It does illustrate that one cannot predict beforehand how effective such a system will prove in actual combat.\textsuperscript{85} Tactical air is not unique in this regard. A similar list would apply to any attempt to make technology the focus of efforts to improve the effectiveness of a military force. To place technology in its proper place in a Sun Tzu / Boyd assessment, one must stay with the concept of a military force – people, ideas, hardware, in that order. Technology can make a difference only if it is integrated into this scheme. That is, given a well-trained, cohesive, motivated force using maneuver warfare / 4GW tactics, technology appropriately tested and evolved can provide them with better tools to do the job.

Neither Sun Tzu nor Boyd denigrated the role of technology, but neither would they have given it the primary role in determining the effectiveness of a military force. It could be argued that Sun Tzu simply did not have this option, that it was impossible to gain a technological advantage in that era. However, a closer examination shows that his was also an era of technological change, with the crossbow, for example, rendering the chariot obsolete, better grades of iron (and even early steels) becoming available, and the first known appearance of gunpowder. Yet nowhere does Sun Tzu suggest that the path to victory for either a general or a ruler involved who had the stronger crossbows or the hardest iron or even had figured out how to make a weapon from gunpowder.

In “Conceptual Spiral,” Boyd concluded that the OODA loop could be applied to technology as well as to strategy and tactics. The process of developing, testing, and using technology is iterative, and the process of iterating must move through the people and doctrine elements, which in the Sun Tzu / Boyd formulation are decisive and must always remain the focus. As Boyd’s “Patterns of Conflict” demonstrates, there are many examples of the side with the superior organizational climate and doctrine prevailing over the side with the superior weaponry. In fact, it would not be too facetious to suggest a new law of combat effectiveness: The side with the most expensive weapons loses.
This is not a coincidence. In one of the few instances where Boyd addresses hardware directly, he notes that:

*Complexity (technical, organizational, operational, etc.) causes commanders and subordinates alike to be captured by their own internal dynamics or interaction – hence they cannot adapt to rapidly changing external (or even internal) circumstances.*

The effects of this internal focus were noted above: confusion, disruption, disintegration – the very effects one should be trying to create in the enemy.
Creating Forces

Although the strategies of Boyd and Sun Tzu may seem complicated, with numerous lists and in Boyd’s case, hours of briefing slides, much of this, including practically all of Sun Tzu, provides guidance for employing forces and only indirectly affects their creation. At the very beginning of “Patterns of Conflict,” however, Boyd did suggest four elements that would enable a force to function effectively in maneuver conflict and 4GW. Two of these are external and two internal:

<table>
<thead>
<tr>
<th>It is advantageous to possess a <strong>variety</strong> of responses that can be applied <strong>rapidly</strong> to gain sustenance, avoid danger, and diminish an adversary’s capacity for independent action.</th>
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<tr>
<td>The simpler organisms – those that make up man as well as man working together with other men in a higher level context – must cooperate or, better yet, <strong>harmonize</strong> their activities in their endeavors to survive as an organic synthesis.</td>
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<tr>
<td>To shape and adapt to change, one cannot be passive; instead one must take the <strong>initiative</strong>.</td>
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A look back at Boyd’s “organizational scheme” on p. 40 illustrates one way to satisfy these four criteria. Organic structures in general and military forces in particular that possess these qualities gain great competitive advantage:
they can operate with quick/inconspicuous/irregular OODA loops, they can play the *cheng / ch'i* game, and they can generally shape the course of the conflict, responding as necessary to moves by their thinking human opponent. The rest of this paper will apply these four qualities, along with the other insights of Boyd and Sun Tzu, to the (re-)creation of U.S. military forces (people, ideas, and hardware).

In creating forces and assessing them, one needs to ask:

- **Do they offer the requisite variety?** Do they present a wide range of options to the people actually conducting the conflict? Do they facilitate the creation of *cheng / ch'i* situations? As noted above, Boyd placed a premium on selecting the option that would be least expected by the enemy, not necessarily the one that is predicted to be the most effective, and a wide variety of options from which to select is a prerequisite.

- **Can commanders rapidly shift the focus if required?** When a decision is made, are forces structured and trained so that it can be rapidly carried out? Is this capability being tested and exercised under a variety of circumstances? When selecting between quickness and predicted effectiveness, is there a strong bias towards quickness?

- **Are people and forces being trained to act in harmony?** Are organizations formed to foster harmony? Is this quality exercised in a variety of circumstances and are those who prove adept in its employment promoted?

- **What is being done to ensure that people at all levels will take the initiative in harmony with others in the force to achieve objectives?** In particular, are all commanders trained to issue mission orders?

Although effectiveness on the battlefield depends on people, ideas, and hardware in that order, when creating forces there can be advantages to starting with ideas. There are instances where superbly trained and led troops have been defeated because of flawed doctrine. The bloody and indecisive battles of World War I immediately come to mind. But more important, different ideas, strategies, and doctrines make different demands on people. They answer the question, “training to do what?” for example. So although people will predominate once in combat, this paper will begin with the ideas element of Boyd’s trinity.

Instead of detailed tactics, followers of Sun Tzu evolved what might be called a way of thinking about conflict. This paper has previously noted its
applicability to guerilla warfare by Mao Tse Tung. That guerillas should be using Sun Tzu is not surprising, given his emphasis on deception and formlessness, since guerillas that become predictable are quickly eliminated. As the world moves into the 21st Century, such forms of highly irregular and unpredictable conflict are becoming the only way for many opponents to confront U.S. military forces. The prediction is that “fourth generation warfare,” which is in a sense “asymmetric” conflict pushed to its limits, is what the U.S. military will have to face in the future.

As the originators of the term noted, 4GW is nothing especially new and may represent the oldest form of organized conflict between groups of humans. Sun Tzu has been recommending asymmetric conflict for 2,500 years, although he did not draw any distinction between what today would be called highly irregular, 4GW and any other type. When applied to large-scale “conventional” conflict, that is, where both sides have large forces and roughly equal levels of technology, the result is often known as “maneuver warfare” or “third generation warfare.”

**Maneuver Warfare**

When confronted with a well-armed opponent in conventional formations, the temptation might be to try to engage and defeat him in a decisive battle, under the assumption that if one wins and enough of one’s forces survive, one can then have one’s way with his country and people. This notion of “bringing the enemy to battle” and defeating him as the goal of war characterizes first and second generation warfare (the difference primarily involving how it is done). One only has to envision the monstrous battles of the U.S. Civil War, World War I and most of World War II to realize that this method, even when successful, leads to high casualties and enormous destruction, clearly what Sun Tzu had in mind when he cautioned that:

> The general rule for the military is that it is better to keep a nation intact than to destroy it … Therefore those who win every battle are not really skillful – those who render others’ armies helpless without fighting are the best of all.\\(^9\)

Although few would argue this, at least in political circles, many people continue to regard it as an unobtainable ideal if not simply a fairy tale. Interestingly enough, however, there have been any number of successful com-
manders who operated exactly according to Sun Tzu, even during the bloodiest of wars. Between leaving Chattanooga on May 1, 1864, and entering Savannah over seven months later, Sherman initiated a grand total of one major battle against a prepared Confederate position – Kennesaw Mountain, June 27, 1864 – which he lost. Other than that, the entire Atlanta campaign was one cheng / ch’i operation after another. Certainly Sherman was an adequate tactician, capable of fighting battles should they be forced upon him, but that was not his strategy. Sherman so befuddled the Confederate leadership that they replaced Joe Johnston (who had a good idea of what Sherman was up to) with John Bell Hood (who hadn’t a clue). Hood proceeded to launch four bloody battles and lose them all, thereby handing Atlanta (on Sept. 3), the upcoming 1864 election, and most probably the Civil War to Lincoln and the Union.

Maneuver warfare follows Sun Tzu’s admonition that:

*The condition of a military force is that its essential factor is speed, taking advantage of others’ failure to catch up, going by routes they do not expect, attacking where they are not on guard.*

As encapsulated by one of its creators, the essence of maneuver warfare is:

*Warfare directed towards destroying enemy cohesion as opposed to seizing real estate; at taking the enemy force out of play decisively instead of wearing him down through slow attrition; high tempo war; fluid war that has no defined fronts or formations; decentralized armies where troops act on their own with high initiative as opposed to centralized command structures where troops ask permission and wait for orders; war designed to place the enemy in a dilemma, to suck him in to traps of his own creation, taking advantage of his stupidities and weaknesses and avoiding his strengths; war where soldiers act on judgment not on rules; war without rules; war that seeks to penetrate the enemy rather than push opposing lines backwards and forwards; war waged by a cohesive team that is like a family or tribe with a common culture and common outlook; a willingness to fight close, not just applying firepower from a long standoff, but infiltrating when the opportunity arises, as did 1st. Marine Division in Desert Storm.*

Or, as expressed by a contemporary U.S. Army theorist,
“In maneuver warfare, we attempt not to destroy the entire enemy force but to render most of it irrelevant.”

Interested readers can find detailed descriptions of maneuver warfare in the *Maneuver Warfare Handbook* and in the various U.S.M.C. doctrinal publications, especially MCDP 1, *Warfighting*. Although 4GW concepts are still evolving, Boyd and Sun Tzu certainly believed that the mental agility, rapid tempo of operations, and consideration of mental and moral effects demanded by maneuver warfare would also carry over to what we now call fourth generation warfare.

**People Issues in Maneuver Warfare**

Although people issues are not glamorous like new ships and fighters, and do not provide the opportunities for political engineering and simple pork-barreling inherent in large weapons programs, no credible strategist argues that they are not the heart and soul of an effective military force. There are just too many cases of poorly trained and led soldiers clambering out of their shiny new weapons to escape capture or death. It follows that any “defense review” should focus the bulk of its efforts on these issues.

Both Sun Tzu and John Boyd insisted that people and cultural factors were the keys and would have put the vast majority of their emphasis on these areas. In fact, it is unlikely that Sun Tzu would recognize the U.S. Defense Department as a military force. We now have nearly 300,000 people working in acquisition, for example, compared to 42,000 in combat arms battalions. Personnel are shuffled constantly so that cohesion (the single largest component of force effectiveness) is impossible.

Recent experience shows that the current Army personnel system, which was created in the late 1940s to mobilize massive armies to fight a war with the Soviet Union, cannot deploy rapidly enough to deal with flare-ups like Kosovo. When forces do reach the field, they lack the cohesion that would come from years of training together and the trust this engenders. As both Sun Tzu and Boyd insisted, these virtues are the foundation of success for any military force.

Comments from top-performing junior officers reinforce an impression of increasing mistrust and lack of cohesion:
“The Army’s senior leadership has a definite credibility problem. There is a lack of trust.”

“Until an officer corps that possesses impeccable character and leads by inspiration is developed, you will continue to see a mass departure of junior officers.”

“Even though we have completed the draw down, I still feel that many officers are so worried about their careers that they still back stab. Again, I think this is what many did to get through the draw down. It is now ingrained in these officers.”

“Senior officers are willing to throw us under a bus if it would advance their careers.”

“We talk about initiative and agility, but we reward officers who follow a rigidly prescribed path to success; being innovative will get you fired unless your results are so outstanding that your boss can’t slam you. Forget about taking risk; we don’t reward risk takers.”

Perhaps the best single indicator of problems in the personnel system is the rate at which the Army’s fastest burners are turning down chances for a general’s star. By the time they qualify for retirement, at 20 years service, many of the Army’s best are declining the opportunity for the command slots that would qualify them for senior rank. As Figure 4 shows, these declinations have escalated to unprecedented levels. Readers should understand that these officers have devoted their entire working lives to the Army and by virtue of their selection to this level of command, had a legitimate opportunity to achieve the pinnacle of their profession, general officer rank, in due course.

FIGURE 4: Command Declinations

<table>
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<tr>
<th>FY92</th>
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<td>22</td>
<td>39</td>
<td>32</td>
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Year to Date

Cohesion
According to Sun Tzu, The Way of military operations winds through unit cohesion:

Those whose upper and lower ranks have the same desire are victorious.¹⁰⁰

Logs and rocks are still when in a secure place, but roll on an incline; they remain stationary if square, they roll if round. Therefore, when people are skillfully led into battle, the momentum is like that of round rocks rolling down a high mountain – this is force.¹⁰¹

Therefore good warriors seek effectiveness in battle from the force of momentum, not from individual people.¹⁰²

Cohesion works because it creates and in turn depends on trust.¹⁰³ Boyd as noted above stressed harmony as an essential element of any successful organism, and put “mutual trust,” translation of the German einheit (literally, “oneness”) at the top of his “organizational climate for operational effectiveness.” He concluded that:

Harmony in operations is created by the bonds of implicit communications and trust that evolve as a consequence of the similar mental images or impressions each individual creates and commits to memory by repeatedly sharing the same variety of experience in the same ways.¹⁰⁴

Throughout history, cohesion/trust is the one constant among successful, highly effective units. It has been called the “lubricant for friction” in military operations.¹⁰⁵ This strongly suggests that the first item in any defense review by Sun Tzu and Boyd would be to stop doing those things that erode cohesion and mutual trust. In his epochal study, The Revolution in Human Affairs,¹⁰⁶ U.S. Army Maj. Don Vandergriff describes specific changes that could be made:

• Pass a new Defense Officer Personnel Management Act.
  - Replace “up or out” with “up or stay” for O-3 and above.
  - Reduce the size of the officer corps in the land forces to 5 percent over 10 years.
  - Replace the “all or nothing” retirement system with a “Vest at 10, collect at 55” approach.
• Design the land forces structure around a regimental system (for cohesion).
  · Flatten the force structure, eliminating many HQs above brigade.
  · Integrate reserve and active components into each regiment.
• Empower leaders (note: Boyd’s “mission concept,” derived from the German auftragstaktik).
• Change the personnel management system.
  · Accessions and entry.
  · Education.
  · Decentralize management and promotion policies.

The remainder of this 107-chart tour de force supplies the historical background, comparisons with other countries’ military systems, and detailed recommendations for implementation. Those charged with improving the effectiveness of U.S. military forces would get more benefit from studying Vandergriff’s work than from any of the institutional “defense reviews” now underway. The entire briefing is available at Defense and the National Interest, http://www.d-n-i.net.

Even a brief analysis of Vandergriff’s recommendations demonstrates that not only would they greatly increase the effectiveness of U.S. military forces, they would actually save money. Obviously, officers are more expensive than enlisted, so reducing the percentage of officers not only improves the force by devolving increased responsibility downward, but it also lowers cost. Similarly, eliminating “up or out” provides a higher return to the nation on the training and experience for which it has paid.

So the very first step Boyd and Sun Tzu would probably take in their review would be to recommend measures, such as a return to the regimental system, to improve cohesion. In addition to Vandergriff’s proposals, defense leaders might wish to study the recommendation first made by management theorist W. Edwards Deming to eliminate the annual merit review (officer and enlisted performance reports). These reports, especially when ranked, pit one individual directly against another and provide strong incentives that work against unit cohesion.

**Training**
The “people-ideas-hardware” orientation suggests that training needs to be robust, even at the occasional expense of procurement. One of Boyd’s four
principles for operational effectiveness (p. 40) was “intuitive competence,” which can only come from increasingly rigorous training of individuals and units at all levels under a variety of conditions as closely related to real conflict as possible.

Unit training, particularly free play exercises, not only improves proficiency, but it creates cohesion and mutual trust among its participants. Exercises can also be a laboratory for evolving the ideas that will win in the theater of operations. Some measure of the German success in the blitzkrieg rests on the doctrine and relationships that were created, ironically in Russia, by the future leaders of the German Army testing their ideas in the 1920s and early 1930s. Had the allies allowed the Germans a normal military establishment, it likely would not have been as effective.

One can safely conclude that Boyd and Sun Tzu would carefully review training programs to ensure that they provide the preparation necessary for success in conflict.

Leadership
As one reduces the percentages of officers, eliminates intermediate headquarters, and uses performance in the field as the primary criterion for promotion, one should naturally improve leadership.107 Although bandied about for years by management theoreticians, “leadership” in the military carries a heavy load. Boyd defined it as:

*The art of inspiring people to enthusiastically take action toward the achievement of uncommon goals.*108

Assessing leadership is subjective, but it need not be arbitrary. Free play exercises, for example, can provide a tool. A person should not be selected to command a battalion, for example, until he or she has demonstrated in a series of these exercises proficiency in running a company. In fact, free play exercises in some form should become the largest single component of selection for promotion, unless overridden by performance in actual combat. If one combines such exercises with elimination of the automatic “up or out” promotion system, commanders will gain the confidence to develop their skills and those of their subordinates through experimenting and learning. Of course, commanders who do not develop such skills will either be assigned to other duties or retired.
This is one area where funding will probably have to be increased. Free play exercises must be carried out frequently enough so that new commanders and their units can experiment as they are learning their jobs. Not only must the exercises themselves be funded, but costs of the depreciation on the equipment also must be covered, since to be effective in developing leadership and doctrine, these exercises must be as frequent and as realistic as possible.109

Under this system it would be performance – in exercises but also in actual operations – that primarily select for promotion. Attendance at service schools such as the Command and Staff and War Colleges would have no direct impact. Service members who aspire to the higher ranks will need a broader education. They may choose to attend these if they believe that it would improve their performance enough to justify the time spent. Credential-ism counts for little in high-performing civilian organizations, and there is no reason it should continue to exert such strong influence in the military.

The Officer Corps
Boyd and Sun Tzu put considerable emphasis on the importance of leadership, and Congress and U.S. national command authorities should do likewise, especially in the area of commissioning officers. In the British Army, from which the U.S. system largely derives, officers held the King’s (now Queen’s) Commission. This allowed them to act in the name of the monarch, in particular, to issue orders that held the force of law. Disobeying such an order was tantamount to treason and could result in execution. In the U.S. military, commissions begin with “The President of the United States …” but other than that, little has changed. Commanders, who must be commissioned officers, can still issue life-and-death orders and can, when necessary, invoke the Uniform Code of Military Justice to ensure they are obeyed.

This is a somber, awesome responsibility and as Vandergriff has noted, should be awarded sparingly, and only after a rigorous training and selection process. Most jobs in the military do not require commissioning and could be performed as well by enlisted, NCOs, warrant officers, or civilians. It is not clear, for example, why one must be commissioned to operate an aircraft in the Air Force, Navy, or Marine Corps, but not in the Army.

Once the percentage of officers has reached a target of around 5 percent, defense leaders should review commissioning programs. To generate the much smaller numbers of new officers that will be needed each year, it may be
desirable to eliminate service academies and Reserve Officers Training Corps (ROTC), and commission entirely through officer candidate schools, after a period of evaluation in the enlisted ranks. If a college education is required for certain positions, the nation has more than 1,500 accredited institutions of higher learning from which to choose.\textsuperscript{110}

**Equipment and Organizations for Maneuver Warfare**

It is certainly possible to execute maneuver warfare and 4GW with the equipment the U.S. military has today and has planned for the future. As the 16th Century samurai philosopher Miyamoto Musashi insisted, a warrior using this strategy and armed only with a fencepost can take on a fully outfitted samurai and defeat him as Musashi in fact did.\textsuperscript{111} Three hundred years later, blitzkrieg warfare achieved its greatest success, against France and England in May 1940, when German tanks were generally inferior to their allied counterparts in quality and in numbers.

However, the question is whether, by applying the principles outlined by Sun Tzu and John Boyd, one can produce a force more attuned to the challenges of the modern post-Soviet world, and perhaps reduce the burden of defense on the national economy. The people and ideas portion, which relates primarily to harmony, initiative, and rapidity of decision, was considered in the previous sections. This section will look at the more visible part of military forces – hardware and organizations – and will begin with an assessment of the demands that maneuver warfare and 4GW make on them.

First, military hardware and organizations must possess the inherent variety of action to facilitate \textit{cheng} / \textit{ch‘i} maneuvers. To belabor a point, in the Boyd / Sun Tzu scheme the estimated effectiveness of the force to perform any given option is important, but not the dominant element of victory. Of much greater weight is the range of options the force offers and the rapidity with which it can switch between them. This weighting reflects the fact that a clever and motivated enemy can develop counters to any particular capability. One force will win because – through training, cohesion, and leadership – it can create options for itself and dilemmas for the enemy, and switch between them more rapidly, more inconspicuously, and with more irregularity than the enemy can cope.

What the U.S. military must ask of hardware and formal organization is that it facilitate this \textit{cheng} / \textit{ch‘i} process or at the least not hinder it unduly.
Ponderous though highly lethal forces will constrain options for commanders, since they are most suited to cheng roles.\textsuperscript{112} Also, it is a challenge to become formless with such a force, and its attendant logistical tail.\textsuperscript{113} Great armored sweeps through the desert and the 31-hour missions of the B-2 bomber in the NATO-Serbian War come immediately to mind.

Once an option is selected, performance of it does come to the fore. Maneuver warfare requires that forces must be able to sustain a high operational tempo so that when a vulnerability (“gap”) has been created or discovered, it can be exploited.\textsuperscript{114} Since the enemy is a clever and determined human being, one must assume he will find and close gaps as rapidly as possible, or, even more insidiously, change them into traps, or convert some of them into chengs of his own by attempting to create and exploit gaps in one’s own forces. If he can do this more rapidly than friendly forces can cope, he can create Boyd-type effects: panic, confusion, and chaos, leading to collapse.\textsuperscript{115} This suggests that forces with mission cycles measured in days, or in some cases even hours, will find it difficult to function as the ch’i component of maneuver warfare, thus limiting the options for commanders.

Logistics and support requirements also play a role in sustaining high operational tempos. In the worst case, a force will self-attrite if its equipment breaks down or takes too long to repair, or it may simply grind to a halt if it runs out of fuel. Any of these obviously interfere with the ability to maneuver and create and exploit gaps. Systems that require extensive logistical support also tend to focus commanders’ attention inward. During the 19th and early 20th centuries, for example, it was the rare commander who could envision how to break free of the railroads that were providing his sustenance. Part of the genius of both Grant and Sherman is that they were able to convert this obvious dependency into a cheng, that is, fool Confederate commanders into attacking “lines of supply” while they launched out cross country: Grant towards Jackson and Vicksburg, and Sherman towards the sea.\textsuperscript{116}

There is also the complexity issue. As Boyd warned (p. 48), complex hardware and systems tend to focus organizations inward, which can accelerate the trend towards confusion, disintegration, and collapse. However, technical complexity \textit{per se} is generally not the most severe issue, since it generally “just” degrades how often the system is available for combat. This is bad enough, and can push the focus inward, but in the hands of a skillful commander can also be mitigated or even used to deceive the enemy, in the man-
ner of Grant and Sherman. Organizational complexity, however, is much more debilitating and is the key component in Clausewitz’s famous friction. 117 It represents organizational entropy that dissipates energy and converts it into chaos, without having to wait for the enemy to do it. In particular, the OODA loops of complex organizations can degrade very quickly in such an environment, making them vulnerable to cheng / ch’i maneuvers by the other side.

Because of this slowing of OODA loops, complex organizations typically become predictable. Through great effort, they master a small number of options, and they execute these over and over again. Perhaps the most familiar example is the practice of flying “route packages,” the same bombing routes on every mission, which allows even a Third World opponent to set up flack alleys and MiG orbits. Serbia used the U.S. military’s predictability to shoot down one of the previously-thought invisible F-117 stealth fighters.

The real problem with very complex equipment is that it spawns complex organizations to operate, support, and maintain it. In other words, technical complexity tends to generate organizational complexity.

**Force Structure Options**

If hardware is tertiary, why not just stick with what the U.S. military already has? The problem with this alternative is that it requires spending at Cold War levels on Cold War equipment, but without a Cold War threat. It also turns top leaders’ attention away from creating effective forces and towards lobbying for hardware programs. The issue is whether the United States could carry out a maneuver warfare strategy by using fewer resources, do it better, and in the process avoid some of the problems caused by continuing an enormously large defense establishment (Eisenhower’s “military-industrial complex”) now that the Cold War has ended. 118

Although obtaining a more useful force for less money may seem paradoxical in an era when senators are proposing (apparently seriously) to increase defense spending to nearly $350 billion per year in order to protect the United States from countries with combined defense budgets of around $100 billion, it will seem perfectly plausible to anyone who has studied other implementations of Sun Tzu, especially in the commercial world. 119

Japanese auto-makers, for example, evolved ways to build cars with a fraction of the quality problems of their U.S. competitors, and do it for lower cost and in less time. It turns out that by installing such a “lean production” sys-
tem, they can not only respond better to changing customer preferences, but they can actually help shape those preferences, exactly as Sun Tzu predicted.120

In particular, implementing lean production forces an organization to eliminate waste, thereby reducing cost while simultaneously improving quality, efficiency and time to market.121 Enterprises that successfully employ lean production routinely take market share from those who do not, and, because of their lower costs, generally post far better bottom lines. It should also be noted that improving mutual trust is a key element in implementing lean production, and that coincidentally, the people who invented lean manufacturing were careful students of Sun Tzu. To see the power of Sun Tzu’s strategy applied to business, one need only note that between 1980 and 1990, General Motors’ share of the U.S. market declined from 52 percent to less than 30 percent, largely driven down by the inroads of Toyota, Nissan, and Honda.122

To summarize the guidelines for constructing a Sun Tzu / Boyd force following the discussion above:

1. Military force is a key component of furthering national interests, but it is not the only component or in many cases even the primary one. It should always be used sparingly.
2. Military forces, when they are used, should obey Sun Tzu’s dictum: end the conflict in the quickest possible time with the least possible damage to either side.
3. Military operations against conventional forces, for example, to assist an ally under conventional attack, must be conducted as maneuver warfare. That implies a substantial capacity to play the cheng / ch‘i game against any potential opponent.
4. Military operations in 4GW must be carefully measured so that, by their very success, they do not strengthen the hands of opponents. It truly is not necessary to destroy the village in order to save it.

As noted above, maneuver warfare provides a framework for implementing such a force and history suggests that there are some characteristics of a force that can reinforce its capabilities for maneuver warfare in the post-Cold War era. The table on the following page is from a recent book on maneuver warfare123 by experts on the subject from all four armed services and the Office of the Secretary of Defense (reflecting their personal views, not official policy).
1. Increased focus on littorals (regions within a hundred miles of the sea), where most of the world’s people, wealth, commerce, instabilities, and U.S. interests are concentrated.
2. Decreased need for large standing land and air forces, and an enhanced role for reserve forces.
3. Decreased need for heavy naval forces configured for global war at sea and heavy bombing forces, with a concurrent shift to maintaining control of littoral regions in support of interventions.
4. The need for intervention and extraction capabilities to protect lives, property, commerce, and other interests, with an emphasis on high-speed lighter forces configured for autonomous operations in hostile regions.
5. The rise of fourth-generation warfare, resulting in an increased need for irregular war-fighting skills/capabilities in close-quarters combat and small-unit operations among state/non-state actors. Characteristic of this are the following:
   a. Decreased reliance on firepower/attrition in ground warfare.
   b. Decreased reliance on deep-strike/interdiction/strategic bombardment of “infrastructure” in air warfare.
   c. Increased reliance on fast-transient littoral penetration operations, info-war operations, Special Forces operations, political-military operations, counter-drug/antiterrorist/antinuclear operations, and increased occurrences of urban/suburban combat.
   d. Increased resource constraints resulting in internal competition for resources.

With this in mind, let’s construct an alternative defense capability. Please keep firmly in mind that neither Boyd nor Sun Tzu ever built such a force, so the recommendations are solely those of the author. The other caveat is that if this paper is successful, the force represented below will satisfy the requirements of maneuver warfare, but that is not to suggest that it is the only force that will do so, or even the best that could ultimately be attained by continuing to experiment and select.
**Strike Forces**

First, the U.S. Marine Corps provides all the conventional ground warfare capability needed to engage the land forces of any Third World country. The three active duty U.S.M.C. divisions provide a range of capabilities, including heavy armor, light armored vehicles, organic artillery, air support, infantry, and so on. In addition, the Marine Corps, beginning with its 1989 edition of *Warfighting*, is the farthest along in adopting maneuver warfare concepts. Using them, the Marines liberated Kuwait in two days and probably could have done it as early as the end of September 1990. Once the rout began, there was nothing to stop a Patton-esque penetration—properly supported from the air (as Patton’s was) and logistically (as Patton’s was not)—from continuing straight on to Baghdad. The big hook around the left flank was at best *cheng*, perhaps unnecessary, and in any case, failed to accomplish its stated objective, since the bulk of the capable Iraqi forces escaped over the Euphrates and are still enforcing Saddam’s regime. This paper will use the existing Marine Corps structure to provide the backbone for conducting maneuver warfare.

The United States then can simplify its defense establishment by eliminating active Army armor and mechanized infantry divisions, and all of their supporting units, higher headquarters, commands, the Department of the Army, etc., representing a sizable savings and a great simplification of the U.S. defense establishment. A certain amount of additional heavy capability can be maintained in the Guard and Reserve, and exercised frequently with the legacy U.S.M.C. conventional components. If done properly, transferring these missions to the Guard and Reserve could actually increase their effectiveness in the rare cases when additional heavy combat capability is needed.

Active Army “unconventional” forces, including Ranger, Special Forces, and Airborne units, will be retained, which have the unique capability among Army units of actually being able to reach the fight while it is still going on. In addition to being major players in 4GW, they can participate in *cheng / ch’i* combinations against both the conventional and unconventional forces of Third World armies. The idea would be to combine them with the Marine Corps into a new “Strike Force.” It is not that these unconventional forces will be the *ch’i* to the Marines’ *cheng*. Enemies would react to that pattern and exploit it. It is that combining these two elements provides a wider range of options for commanders.
This force should provide the requisite variety for carrying out cheng / ch’i operations against any threat it is likely to face on the ground during the next 15 or so years.129

The U.S. military does need to continue research and development to support land forces, particularly in areas that increase tempo of operations and reduce logistical requirements. A large number of ideas for these initiatives will come from – and be tested in – the free play exercise cycles.130

Fire Support
In order to make the land forces more effective, particularly when engaged against conventional opponents, it is necessary to ensure adequate fire support. In keeping with an increased focus on the littorals, one way to provide this in the near term would be to recommission two battleships and modernize their main armament and fire control systems. The battleship provides an invincible platform for delivering effective fire support in the littorals, 16-inch rounds being difficult to counter. Also, the battleship can carry an enormous number of cruise missiles for use against known, fixed targets. The psychological effect of these behemoths, which unlike aircraft carriers can safely steam close enough to shore to be seen, heard, and felt by the inhabitants, is a capability worth keeping. Since they get everybody’s attention, they personify cheng. Paint giant American flags on the side.

To cause enemy formations to stop moving to engage land forces ashore, the new force would need an effective close air support and air interdiction capability. This would facilitate maneuver warfare in littoral areas outside the battleship’s range, and it could also provide fire support and interdiction in conjunction with unconventional forces operating much deeper – perhaps in a thrust / feint towards the capital or ruling junta’s residences, weapons of mass destruction storage / launch facilities, etc. In order to support high operational tempos and interfere with the enemy’s, an aircraft must be developed capable of operating from carriers, as well as far forward from austere bases, and of generating very high sortie rates. Such considerations suggest a short take-off and landing (STOL) aircraft with high system redundancy, very low vulnerable area, low visible signatures, and high loiter capability. Particular attention should be paid to allowing it to operate successfully in an environment infested with man-portable air defense systems (MANPADS – typically shoulder-fired infra-red missiles), of which there are upwards of...
500,000 in the world today, and which have accounted for roughly 2/3 of all aircraft destroyed by ground fire over the last 15 years.\textsuperscript{131} This implies a very low infra-red signature, perhaps less than one-tenth that of an F-16, which is itself some 35 times that of an AH-64 Apache helicopter.\textsuperscript{132} It should be designed to rain enough chaos from the sky to cause Third World troops to rapidly leave their vehicles and not return for an appreciable time.

The Marines have the AV-8B Harrier, but it is expensive, complex, and overly vulnerable to ground fire. U.S.A.F. studies in the mid-1980s demonstrated the feasibility of developing a simpler and more rugged aircraft to meet these requirements. Armed helicopters would largely be retired, since they were developed because the Army was not allowed to have fixed-wing combat aircraft. They are slow, vulnerable to ground threats, and require logistics out of proportion to their effectiveness, as was demonstrated by Task Force Hawk in Albania.\textsuperscript{133}

Since this force is depending on maneuver warfare, there is a need to ensure that enemies cannot use their own air forces to significantly inhibit the ability of U.S. forces to maneuver. This implies at least local air superiority and a robust organic air defense capability. American fighter pilots, flying continually improved versions of current air-to-air platforms – the F-15, F-16 and F/A-18 – are more than capable of engaging any conceivable enemy air forces and keeping them away from on-shore troops. They can operate in conjunction with cruise missile and unconventional attacks against enemy air bases. The force should retain a small number, perhaps 6, modern aircraft carriers (CVNs) to provide protection from enemy air forces until bases can be established ashore and for operating the more vulnerable intelligence, electronic warfare, and command-and-control platforms. It also should keep a robust research and development program in this area, including MANPADS and other highly mobile, logistically simple means of air defense and improvements to our air-to-air fighters. The Strike Force should establish on-going prototyping initiatives and use the series of free play exercises to test their effectiveness.

All systems to support the land forces, including tactical fighter, attack, and reconnaissance aircraft, would belong to the Strike Force, in harmony with the concept that the legacy U.S.M.C. forms the backbone of conventional land force capability. This would put the onus on the land forces, who are going to have to live with the effects of their decisions, to determine the balance among options for air defense and for fire support.
**Strategic and Mobility Forces**

As for the Air Force, its mission would become purely strategic. There are still thousands of nuclear-tipped missiles in the world, and more countries are joining this club. Part of the Air Force’s mission would be to deter anybody from ever using them. All strategic delivery systems, including submarines and unconventional methods, would belong to this force, as would any eventual strategic defensive systems. Combat missions in space would also belong to this new force.

Tactical aircraft from the Air Force and the Navy would be transferred to the Strike Force. Intra-theater, or tactical transport by whatever means, including C-130, helicopter, or ground, would belong to the Strike Force, which would have to determine the balance between transport by air and by other means in the vicinity of operations on land. Inter-theater transport aircraft, such as the C-5 and C-17, would be transferred to the Navy/Mobility Force, whose mission would become to move and support the Strike Force anywhere in the world.

Strategic bombers, if they are kept, would be just that: strategic. Their long mission cycles mean they are basically airborne trucks, hauling weapons that will attack either stationary targets or those that move VERY slowly. To the extent that these types of targets figure in maneuver warfare, with its emphasis on rapid creation and exploitation of vulnerabilities, they can be already engaged with cruise missiles from offshore or with stand-off weapons from existing fighters. Large-scale attacks on “infrastructure,” of the type carried out by B-2s in Serbia, almost always have an effect on civilians and so can solidify support for the enemy regime.\(^{134}\)

**Assessing Effectiveness**

The proper way to assess such a force is not by its numbers or its Lanchester coefficients or results of computerized models or by any other measure of predicted effectiveness.\(^{135}\) As paradoxical as this might seem, it rests on the fact that if one can perform these calculations, so can one’s opponents, and they will take pains to ensure that one encounters something different on the actual battlefield. The measure of this conceptual force is its ability to engage in maneuver warfare, to play the orthodox against the unorthodox, to shroud itself in ambiguity, to execute the response that is least expected, to cause the maximum amount of confusion and then exploit it, and so to win before the battle is fought.
An examination of this force shows that the need for “jointness” is vastly reduced over today. The Strike/Land Forces “own” all combat on land, including all fire support. Similarly, the Mobility Forces own all assets for moving the strike forces into the theater, and the Strategic Force has all the wherewithal for launching weapons of mass destruction and countering those launched by an enemy. The net result will be a breathtaking reduction in the complexity of the defense establishment.

In constructing this force, this paper has concentrated on Third World opponents. Doesn’t this leave the United States vulnerable to other threats? A look at the globe shows that as of 2001, the only other countries that could even potentially threaten the United States conventionally (i.e., other than with nuclear weapons) would be China and Russia. This paper has not used either of these as a justification for sizing conventional forces for several reasons:

1. Neither has shown any sign that it is intending a conventional attack against its neighbors, with the possible exception of China against Taiwan.
2. Both face massive internal problems that limit the resources they can devote to military programs. The same week the Chinese impounded our EP-3 on Hainan, 26 more Chinese refugees were discovered in a shipping container in Los Angeles.
3. Both have thousands of miles of borders with countries that could pose threats. The newly independent states in Central Asia, for example, are experiencing insurgencies involving religion that could spread to China and Russia.
4. The United States alone already outspends China and Russia combined by a factor of three, and much of the spending that these two countries do undertake is wasted in corruption and inefficiency. Although spending is a deeply flawed measure, such disparities do underline how poorly China and Russia now serve the role of “Major Threat.”
5. Both countries maintain only a marginal military capability in anything other than size. Russian pilots, for example, average around 10 flying hours per year, compared to the over 20 per month considered a minimum for U.S.A.F. pilots. Roughly half of their 2,000 aircraft are unserviceable and many fighter regiments get no flying hours at all. Recent detailed analyses by Western think tanks do not rate the Chinese much higher. Chinese pilots, to cite one instance, typically train only for
one-on-one tail chase intercepts. The Chinese strategic capability consists of around 20 nuclear weapons.  
6. For the United States to engage either of these countries on the ground, at least in the foreseeable future, it would have to go to them.
7. Any scenario that envisions U.S. forces alone confronting Russia or China on the ground would represent a massive failure of grand strategy. Where are the allies? If the United States is the only country in the world that believes that armed combat is the solution in this case, then perhaps that is a sign the strategy is flawed. Otherwise, it is necessary to add the assets of NATO and other allies into the equation.
8. All this could change, but it will take time. The United States can influence events as they unfold with an active grand strategy, combined with effective intelligence and selective use of other instruments. If the U.S. government and public are unwilling to stay so engaged, then it is truly only a matter of time until the nation becomes isolated – physically, mentally, and morally – and is inflicted with the confusion and internal disorder Boyd predicts.

**Intelligence**
Since both Sun Tzu and Boyd believed that an ounce of intelligence in the hands of a capable general is worth several pounds of combat, the U.S. military must improve its ability to operate as open systems and pull in information. The best way to do this, as Sun Tzu noted, is to accord successful performance in intelligence the same high honor as one does successful performance on the battlefield proper. In other words, the changes needed involve people and culture. Consider:

1. The highest-ranking officers actively involved in intelligence are the directors of the National Security Agency and the Defense Intelligence Agency. Both are 3-star assignments. Neither is considered a pathway to a fourth star.
2. In the Air Force, intelligence is now a directorate within Operations. The head of Air Intelligence is a 2-star. Air Intelligence Agency is now a subordinate unit under Air Combat Command.
3. With rare exception, highest rank is earned from a successful career in operations. In the Air Force, this means as a pilot (originally bombers
but now generally fighter) with command of successively larger flying units, and then head of a major command (Air Force Materiel Command, Air Combat Command, etc.) or as a regional commander in chief. Similar situations hold in the other services.

4. The heads of the service support commands, e.g., Air Force Materiel Command, outrank the senior officer involved with intelligence in the entire U.S. defense establishment.

5. Even at the lower levels, intelligence is rarely considered a plum assignment, on a par with leadership or command of a combat arms unit or a flying squadron or a ship.

Within DoD, intelligence must be raised to a level co-equal to operations.

• Promotion rates all the way to 4-star should be just as good for intelligence as for flying F-15s or commanding infantry units.

• Assignments in human source intelligence (HUMINT), especially overseas in designated regions, should be considered as combat tours. This is spying, pure and simple, and it can be deadly, even in “peacetime.” Most target countries are not known for their respect for human rights in general, and they have limited senses of humor when it comes to spies.

• Developing an effective HUMINT capability is difficult and requires years of experience, both in “tradecraft” and in knowledge of the people and regions of interest. Nowadays this is practically the whole world: How many people, even in intelligence, could have found Kosovo on a map before, say, 1994? However, the time needed to develop this capability, and the secrecy required, seem always to lead to inbreeding, inward focus, and bureaucracy, as has been seen over the last several years with the Central Intelligence Agency (CIA). Somehow this paradox must be solved.

• The CIA should become just that, a data gathering and intelligence-generating agency. DoD should have responsibility for covert operations for other purposes.

• To the extent possible, competition is good, especially in interpreting raw data and information. In the case of most “intelligence failures,” post-mortems show that the facts on the ground were known somewhere in the intelligence community, but the correct interpretations did not reach senior leaders in time. Rarely is the situation so clear and
moving so slowly that a fully coordinated intelligence document will do any decision-maker any good.

- The rule for intelligence is the more it is used, the better. People selecting combat arms might go their entire career without firing a bullet in anger, but intelligence operatives will have plenty of opportunity to practice and therefore be assessed on their performance in the real world. This should help attract a larger number of highly dedicated and trained “fast burners” into the field.

In the Sun Tzu scheme, the commander is his own director of intelligence. He strives to develop a fine sense for the physical, mental, and moral state of the enemy force. He is constantly probing the enemy for information by recruiting agents of his own and turning enemy agents, and he uses his agents to sow confusion and mistrust in the enemy camp. On rare occasions, he may also engage in combat operations (“to win without fighting is best”). If we try to make maximum use of Sun Tzu’s advice today, we might conclude that it would make more sense to place Operations under Intelligence.

**Application: National Missile Defense (NMD)**

Neither Sun Tzu (of course) nor Boyd addresses this area directly. There are, however, some ideas one might be able to apply. Most concepts for missile defense are explicit and expensive. That is, they rely on development of complex systems to physically destroy enemy missiles during various stages of their flight. To achieve any degree of confidence, it would probably be necessary to develop and deploy some combination of systems. Also, U.S. leaders and the public need to be convinced that these systems will work first time against all enemy attempts to deceive, decoy, elude, overwhelm, or otherwise counter them. So NMD is not simply an engineering problem of “hitting a bullet with a bullet,” although this is proving difficult enough.

Finally, once all these problems are solved, one must find ways to detect and destroy nuclear devices delivered by any number of other means. According to a recent study, there are some 80,000 cruise missiles, with ranges starting at 100 kilometers, deployed by 81 countries around the world. Although 90 percent of these are anti-ship missiles, the study concludes that it would not be difficult to convert them to the land attack mode. Adding to the ways of delivering a weapon to U.S. shores are the limitless number of
pilotless or kamikaze (martyr) aircraft, commercial freighters (which could provide a platform for launching a salvo of short-range cruise missiles), rental trucks, and … well, let your imagination run wild. In summary, explicit missile defense represents contracts for the defense industry into the dim and distant future, but doesn’t appear to offer much hope for true security against attack by weapons of mass destruction.

When “solutions” become more complex than any conceivable threat, something is wrong. From the standpoint of Sun Tzu and Boyd, one could note:

1. All these concepts surrender the initiative to the attacker. This is something that neither Sun Tzu nor Boyd would ever do. Ever.146
2. By trying to prepare a defense against every possible point of attack, one would seem to be violating one of Sun Tzu’s primary maxims: “Preparedness everywhere means lack everywhere.” This is also known as the “Maginot Line Syndrome.”147
3. Both Boyd and Sun Tzu insist on attacking the mind of the enemy first. Both rate attacking alliances higher than direct military action.
4. Both value ambiguity. Our explicit schemes and long development cycles clear any ambiguity from the attackers’ minds.
5. Both see military means as only one tool in the art of war, even after recourse to war has been selected.

Putting all this together suggests a strategy for national missile defense – and for protection against weapons of mass destruction in general – something like the following:

- At the grand strategic level, sell the idea of “rogue states” (or whatever is the currently acceptable term for Third World countries the United States does not like) to allies and other strong powers such as Russia and China. One could remind these powers that likely new entrants to the weapons of mass destruction club, no matter how friendly they may seem today, are much closer to Europe and Asia than to the United States. It is much more likely that potential new users of mass destruction weapons, such as the Taliban and its admirers and allies, will seek to expand their influence and control into North Ossetia than into North Dakota, at least for the next several years.
• Also at the grand strategic level, sell the notion that the United States, its allies, and others potentially threatened have a moral right to ensure that they are not attacked by weapons of mass destruction. Do not specify the ways this can be done. Sell the notion that development of such weapons outside the group mentioned above is a “crime against humanity” (or some such).

• There are at least three options for dealing with the threat: deterrence by for example certainty of massive retaliation, elimination of the capability prior to use, or destruction of the weapon itself once it is launched or otherwise employed. Given Sun Tzu’s and Boyd’s preference for ambiguity and Boyd’s insistence on a variety of options in any circumstance, one would probably want potential opponents to believe that all three of these are possibilities.

• Publicize a number of programs, some in conjunction with allies or others threatened by rogues with mass destruction weapons, to develop countermeasures. Although one does not need to spend into deficit on these projects, they will also provide a stream of funding to help sustain U.S. defense R&D capabilities and might produce useful spin-offs.

• Greatly improve intelligence efforts directed against countries that appear to be developing (or even could develop) nuclear weapons or other weapons of mass destruction. More effectively exploit the assets of U.S. allies, many of whom have historical ties to the target countries.

• Engage in selective covert measures to retard development of weapons of mass destruction, and to send a personal signal to those involved in such development that they are playing a dangerous game. Train selected forces specifically to rapidly penetrate a threat country, destroy nuclear/biological/chemical weapons and facilities, and perhaps arrest the people involved and even the country’s leadership. Deny the existence of this capability or fabricate cover stories that don’t work very well.

• All measures must be harmonized with U.S. grand strategy so that they are generally supported by allies and by the uncommitted around the world.
The force illustrated above is purely the author’s own creation and not anything Boyd ever proposed. In fact, as noted in the paper, after he retired from the military, Boyd spent very little time or effort on specific hardware or force structure alternatives. I am not willing to make any prediction of whether he would have approved, and people who have reviewed this paper and who are familiar with both Boyd and Sun Tzu are all over the map: There is hardly a single recommendation in the force structure section that does not have both defenders and detractors among this group.

I am much more confident in the people and ideas sections since Boyd did offer prescriptions in these areas, and I have tried to follow them as faithfully as possible. Even if the U.S. military were to leave its current hardware spending plans intact and just implemented the people and ideas sections, it would make major improvements in the effectiveness of forces (and save some money, although that is not the primary purpose). However, I also believe that if the United States had a military composed of people trained and selected on their demonstrated abilities to carry out maneuver and fourth-generation warfare, they would demand weapons more suited to these missions. The military-industrial-congressional complex as constituted today could not stand without its military component.

What sort of force would such newly trained military personnel come up with? It cannot be known at this time. If it could, potential enemies would react to it, thereby causing the U.S. military to do something else. This idea of action / reaction or shaping / being shaped is central to Boyd’s philosophy, which reflects his remarks in the beginning of “Patterns of Conflict” that the theory of evolution by natural selection is one of the two pillars of his study.
of conflict, survival, and conquest (the conduct of war is the other). This strongly suggests that one should not worry too much about what the “final” Boyd / Sun Tzu force will look like, but that if we get the people and ideas parts right, the force structure will naturally evolve by a process of experimentation, selection, and rejection.

What I have tried to do in this paper is show that the set of possibilities is not empty – there is something the current U.S. force structure can evolve towards that is better than that of today in carrying out a strategy focused on maneuver warfare and 4GW. But it is likely, indeed certain, that even if it were adopted, it would be merely a way station along the path to something vastly different and better, that is, assuming we get the people and ideas part right.
1 Blumenson, Martin, *Patton: The Man Behind the Legend, 1885–1945*, Berkeley, 1987, p. 156. Patton was very much in the Sun Tzu tradition and was considered our most dangerous general by many German officers.

2 For Grant, see J.F.C Fuller’s *Grant and Lee; A Study in Personality and Generalship*, Eyre and Spotiswoode, 1933 (widely available in paperback). For Patton, one might start with Blumenson, *op. cit.* General Fuller was one of the primary authors of the Blitzkrieg and one of the first major strategists to rehabilitate Grant. Boyd’s own “Patterns of Conflict” is probably the best summary of the power of maneuver warfare (available at http://www.d-n-i.net).


5 I wish I could take credit for this observation, but it was Basil Liddell Hart who commented that having spent so much money on the Maginot Line, French doctrine just had to support it. See *History of the Second World War*, Da Capo Press, 1999 and *Strategy*, Meridian Books, 1991.

6 “During those years (1909-1916), I had, as the boys in the back room would say, a swell racket. Looking back on it, I feel that I could have given Al Capone a few hints. The best he could do was to operate his racket in three districts. I operated on three continents.” U.S.M.C. Major General Smedley Butler on his operations in Central America (a longer selection from this 1933 speech is available at http://www.fas.org/man/smedley.htm). Smedley Butler was, as far as I know, the only Marine officer to win the Medal of Honor twice.

7 Huang (see next note) 27 places the life of Sun Tzu from 534 B.C. to possibly 453 B.C., although he notes that the book may not have been written in his lifetime. Griffith places the date of its writing at between 400 and 320 B.C. Cleary merely places it during the Warring States Period (5th – 3rd Centuries B.C.)

8 For this paper, I have primarily used the translation by Thomas Cleary (Boston: Shambhala, 1988) and citations without any other identifier refer to this edition. I have crosschecked certain passages with the classic translation by retired Marine Brigadier General Samuel B. Griffith (Oxford, England: Oxford University Press, 1971 paperback) and these will be identified as “Griffith,” and with the heavily annotated translation by J. H. Huang (New York: William Morrow, 1993), indicated by “Huang.”
In 1972, near the town on Linyi in Eastern China, Chinese archeologists uncovered a set of 200 bamboo slats containing a version of Sun Tzu dating from roughly 100 B.C. Although very close to later versions, there are some differences that have caused translators to revise certain passages. For more information, see Huang, 21.

The basic classics of Taoism are usually known in English as the *Tao Te Ching* and the *Chuang Tzu Book*. Both are widely available in translation. A very approachable introduction to Taoism is Alan Watts’ *Tao, The Watercourse Way*, Pantheon 1975. For a readable discussion of the complex relationship between Taoism, Buddhism, and Zen, see Ray Griggs’s *The Tao of Zen*, Alva Press, 1994.

The period of nearly continual warfare known as the “Warring States” began with an attack by several states on another in 453 B.C. – Griffith’s date, although other historians use dates as late as 404 B.C. – and ended with the rise of the Qin dynasty in 211 B.C. Two of the eight large states did not participate to any great degree. By the end of the period all of the minor states had disappeared. This period of constant experimentation in warfare among a myriad of smaller players resembles the situation in Italy which inspired Machiavelli’s *Art of War* or in what is now Germany in the late 18th and early 19th centuries, which led to Clausewitz’ *On War*.

“Quickness” is often translated as “speed.” However, it is important to distinguish between the physical property of *velocity*, which is simply distance divided by the time it takes to traverse it, and the quality advocated by Sun Tzu, which is more like mental agility, rapidity in operational tempo. The ability to move rapidly over the ground can be a valuable tactic in certain situations, but nowhere does Sun Tzu advocate training the troops to march faster or developing faster chariots as the paths to victory.

Again, many translations available. It should be noted that Clausewitz died before his book was finished and so he may well have revised his final conclusions.

Boyd’s works have never been “officially” published. The page numbers refer to his 1986 version of the *Discourse on Winning and Losing*. Each presentation within the Discourse is separately numbered. Citations in this paper use the following system: POC refers to “Patterns of Conflict,” SG to “Strategic Game of ? and ?,” and OD to “Organizational Design for Command and Control.” These can all be downloaded from http://www.d-n-i.net. Boyd’s comments on Clausewitz appear at POC 42.
20 Huang, 112.
21 Musashi has a strong Zen orientation. Unlike Sun Tzu, Musashi does not dwell on the dynamics of people in groups but concentrates on the Zen concepts of “empty mind” and intuitive knowledge. However he is very much in the Sun Tzu tradition by insisting that the spirit of the enemy is the true focus of effort and that the enemy must be defeated mentally and morally before one risks an attack with cold steel. His book gives specific advice on how to accomplish these goals. Boyd’s favorite translation was The Martial Artist’s Book of Five Rings, by Hanshi Steve Kaufman, Charles E. Tuttle Co., 1994. My personal favorite is the translation by Nihon Services Corporation, Bantam, 1982.
22 Griffith, 45-56. Readers may be especially interested in Griffith’s speculation on why the Chinese appeared to abandon Sun Tzu in the latter stages of the Korean War in favor of human wave tactics (55)
23 As of this writing, the most approachable biography of Boyd is probably F. C. Spinney’s “Genghis John,” Proceedings of the U.S. Naval Institute, July 1997, also available at http://www.d-n-i.net. A professional biography by Dr. Grant Hammond of the US Air War College, The Mind of War, has just been published by the Smithsonian Institution (May 2001), and an as yet unnamed biography by author Robert Coram is scheduled for release in early 2002 from Little, Brown.
26 Boyd, SG, 42.
27 Boyd, POC, 132. These three criteria, taken together, define the phrase “operating inside the opponent’s OODA loops.” Nowhere in the Discourse does Boyd write that just executing the “observe to orient to decide to act to observe” cycle more rapidly than one’s opponent was the key to victory. For one thing, he always included “more inconspicuously” and “with more irregularity.” For another, those four arrows represent only half of the eight relationships in the “loop” and omit the Zen-like implicit guidance and control feeds that are the true keys to its effectiveness.
28 Boyd, POC, 88.
Boyd, SG, 36.

Boyd, POC, 114.

Huang, 25.


Defense and the National Interest features an extensive collection of articles on 4GW, including the paper that coined the term: http://www.d-n-i.net.

Hammond, Grant T., “Paradoxes of War,” Joint Forces Quarterly, Spring 1994. Dr. Hammond is professor of international relations and director of the Center for Strategy and Technology at the Air War College. His book on Boyd, The Mind of War, was published in May 2001 by the Smithsonian Institution.


Griffith, 39; the phrase “to one’s own side” was added for clarity.


Smith, CDI, op. cit.

One of the newest possibilities for involving US troops in a fight over vital resources is the somewhat exotic metal tantalum. Required for a variety of electronics and aerospace applications, it is found in rich deposits in Congo, Nigeria, Malaysia as well as Spain, Canada, and Australia, but not in the United States. For more information, see Vick, Karl, “Vital Ore Funds Congo’s War,” Washington Post, March 19, 2001.
51 America’s premier large fighter, the F-15, was approved for initial production in 1973. Its replacement, the F-22, should be approved for production this year (2001) but will not be available in any quantity until around 2010. The collapse of the Soviet Union, however, ensures that the F-15 will remain the dominant air superiority fighter for the foreseeable future.


58 Boyd, SG, 53ff., POC 139.


60 Interested readers may want to put themselves in Lyndon Johnson’s shoes and see if Sun Tzu’s factors would have indicated probable victory in Vietnam.

61 Griffith, 39; readers should note that this powerful assessment applies to any form of human conflict: war, business, politics, sport, etc.

62 Both lists, of five and of seven, appear in the first chapter of Sun Tzu. Huang translates the fourth point as “which side has stronger weapons and people.” This is the only place in any of the translations where the idea of “stronger weapons” is raised. Huang, 39.

63 Griffith, 66.

64 80. Although a ruler should not personally intervene in the duties of the commanders, this passage is not a license for commanders to assume they have a totally free rein while in the field. They are still very much subject to the overall control of their feudal lord. See Huang, 135.

65 Griffith, 71.

66 Griffith notes that this was a period of rapid technological change, with the introduction of hard irons (and perhaps even early steels) that could keep an edge, and particularly the widespread adoption of the crossbow. This weapon, Griffith notes, would have “made colanders of Greek and Macedonian shields” of the time, and probably ended the useful military life of the chariot. (Griffith, 36) Gunpowder was apparently known, but was not used for weapons in this era. Cavalry was introduced shortly after the writing of The Art of War.
There is an interesting new book out on intuitive decision making, Klein, Gary, *Sources of Power: How People Make Decisions*, MIT Press, 1998. If you study the OODA loop diagram, pay careful attention to the “implicit guidance and control” arrows, which represent the intuitive (and very rapid) aspects of the “loop.”

Perhaps the best introduction to Zen from the military point of view is Thomas Cleary’s *Japanese Art of War: Understanding the Culture of Strategy*, Shambhala Press, 1992. This was a personal favorite of Col. Boyd’s.

Those familiar with Col. Boyd’s presentations will note that he shortened it to simply *auftrag*. He spoke little German, but said that one of the German generals he interviewed told him it was acceptable.

This is Boyd’s translation of the German *schwerpunkt*.

Boyd, POC, 132 (“Second Impression”).

Readers might also wish to consult Griffith’s comments on cheng / ch’i (41-42) from the standpoint of a professional warrior.

Recently reiterated in our gross inability to predict what would cause Milosevic to surrender or when. Our original prediction of 3 days eventually turned into 70, and even now the reasons for his capitulation are not clear. See Brigadier General Huba Wass de Czege and Maj. Jacob D. Biever “Power Projection,” *Army*, April 2001.

Boyd, SG, 51. These effects are difficult to produce in a fully computerized “model,” although they can be induced to some extent in war games with human players.

Griffith, 39. This is from the first page of Griffith’s chapter entitled “Sun Tzu on War,” where he brings his personal experience as a military professional to bear on the interpretation of Sun Tzu.


There were reports that the Serbian forces were able to cause havoc with our anti-radiation missiles by jury-rigging microwave ovens. Whether this story is true or not, it does illustrate the type of countermeasures we may face in the future.
See particularly Boyd’s discussion of WWI “infiltration tactics” POC 56-61. He notes that these, as well as guerrilla tactics by T. E. Lawrence and the German Paul von Lettow-Vorbeck, provided a “way out” of the stagnation and enormous attrition caused by the tactics of both sides earlier in the war.

To cite one example, radar guided air-to-air missiles were justified by predicted probabilities of kill well over 50%. In actual use in Vietnam against fighter-sized targets, they achieved slightly less than 12%. See Goertz, Robert D., “An Analysis of Air-to-Air Missile Capability in Southeast Asia,” Maxwell AFB, AL, June 1968, cited in Hammond, Grant T, The Mind of War, Smithsonian Institution Press, May 2001.

Boyd, POC, 176.

Boyd, POC, 12.


66.

As one of the canonical commentators, Chen Hao, explains, “to take advantage of unpreparedness, lack of foresight, or lack of caution on the part of opponents, it is necessary to proceed quickly; it won’t work if you hesitate.” (153) This interpretation fits with the idea that it is mental quickness—as in Boyd’s OODA loop—that conveys advantage and not just physical velocity.


For Sun Tzu, as we have seen in this paper, all warfare is to be as irregular as possible. That is, he made no distinction between third generation maneuver warfare, and what is called 4GW. Boyd also noted that the same concepts underlie both, although they are applied differently. See POC 69, and 107-109.


99 Briefing by Lt. Gen. Timothy Maude, Deputy Chief of Staff of the Army for Personnel, October 19, 2000. Figure 4 is Chart 25. Available at http://www.d-n-i.net

100 81.
101 99.
102 98.

103 See, for example, Shay, Dr. Jonathan, *Achilles in Vietnam: Combat Trauma and the Undoing of Character*, Touchstone, 1995. Several papers by Dr. Shay on trust and cohesion are available at http://www.belisarius.com.

104 Boyd, SG, 18.

105 This is the title of an excellent paper by Dr. Jonathan Shay, at http://www.belisarius.com. Wyly, *op. cit.* also addresses this topic as does MCDP 1, *Warfighting*.


107 For documentation of the current state of leadership within the Army, see the Leadership Survey commissioned by the Chief of Staff in 1999 – 2000 and the report of the Deputy Chief of Staff for Personnel to the October 19, 2000 Commanders Conference. Both are available at http://www.d-n-i.net.

108 Boyd, OD, 37.

109 “Poor leadership” is a key problem in dealing with the effects of our current high personnel, operating, and deployment tempos. Adding additional free play exercises should provide a sharp razor for identifying our very best combat leaders. See the report by former US Army officer and decorated Vietnam veteran John C. F. Tillson, “Reducing the Impact of Tempo,” Institute for Defense Analysis Paper P-3508, October 1999, http://www.ida.org, also available at http://www.d-n-i.net.

110 As Gen. Krulak observes, although service in the ranks prepares superb junior officers, the focus must change as they ascend in rank. At the senior levels, they require a broader education such as that offered by the academies (personal communication, May 25, 2001). There are numerous proposals for retaining but reforming the service academies. A successful tour in the ranks, for example, could be required before admission to the academies, which, unlike officer candidate schools, would still feature a broad, four-year education.

111 “Warriors can use any weapon they choose if they understand my strategy.” Kaufman trans., 88.

112 But not always. If the enemy believes that he has discovered our plans for using heavy forces as cheng and as a result starts looking for a ch ’i attack
elsewhere, then a surprise attack by our armor could in fact be ch’i. Even a direct assault on a fortified position can be ch’i, as was Col. Emory Upton’s attack at Spotsylvania Courthouse, May 10, 1864. This is one reason for Sun Tzu’s admonition that you can’t specify these things in advance. (This is a major theme of Sun Tzu. See, for example, 55, 113, 127, 155)

113 “Be extremely subtle, even to the point of formlessness.” (109) “Therefore the consummation of forming an army is to arrive at formlessness.” (111)

114 Japanese swordsmen tried to cause an instant, which they called suki, during which their opponent hesitated and became vulnerable to a fatal strike (Musashi, Nihon trans., 31). Very high mental agility, “quickness,” was needed to sense and exploit this fleeting vulnerability, but not brute physical speed. “Speed, not being necessarily good, can only cause you to lose control.” (Kaufman trans., 98)

115 Boyd, POC, 132, 151.

116 Boyd, POC, 55.

117 “Everything is simple in war, but the simplest thing is difficult … Friction is the only conception which distinguishes in a general way real war from war on paper.” Carl von Clausewitz, On War, Penguin, 1968, 164 (based on the 1908 translation by Col. J. J. Graham). While Clausewitz was obsessed with minimizing friction on his own side, Boyd, following Sun Tzu and Musashi, was equally obsessed with creating it in the other. See POC 41-42.

118 Perhaps the most extensive collection of data documenting that Eisenhower’s warning was well founded appears in two presentations by Pentagon analyst F. C. Spinney, “Defense Death Spiral,” and “Defense Power Games.” Both of these are available at http://www.d-n-i.net.

119 “Sen. Landrieu Proposes $100 Billion Defense Spending Hike,” Aerospace Daily, March 20, 2001. The commercial analogue of maneuver warfare is generally known as “lean production.” It was created in Japan by Toyota and relies on the same Taoist / Zen framework as maneuver warfare.

120 There is a large set of data that supports this conclusion. A good place to start is George Stalk and Thomas M. Hout, Competing Against Time, Free Press, 1990, and Richard D’Avenni, Hypercompetition: Managing the Dynamics of Strategic Management, Free Press, 1994.

121 “Lean production” refers to implementation of the set of production system design principles and management practices created by Toyota in the immediate post-war years. The core ideas are to establish single piece flow within cells (as opposed to batch production), pull (just-in-time, which implies bottom-up organic control) between cells, and a management climate that encourages people to continuously improve the system. A functioning lean production system will constantly reduce production spans, defects, and costs while producing exactly at the rate customers are buying. Because of its emphasis on
using time as a weapon to shape markets, and its reliance on trust, harmony,
and initiative, lean production is the only manufacturing system that fits into a
competitive strategy based on the principles underlying maneuver warfare.

More recently, Nokia has all but driven Ericsson and Motorola out of the
cellular telephone business, and Dell recently displaced Compaq as the world’s
largest maker of personal computers. Both Nokia and Dell employ many of the
ideas behind maneuver warfare. I have recently completed a paper on lean
production and the defense industry that presents these arguments in more
detail. The paper is available from the Center for Defense Information,

Vandergriff, Maj. Donald, U.S.A., editor, Spirit, Blood, and Treasure, Presidio,
to be published June 2001. I have a chapter in that book.

For arguments that support this assertion, see “The Gulf War, Maneuver
Warfare, and the Operational Art,” by then-LtCol. G. I. Wilson, U.S.M.C.R.,
Marine Corps Gazette, June 1991. Colonel Wilson was one of the original
members of the small group that initiated maneuver warfare in the Marine
Corps.

If it were a cheng maneuver, it could have been performed much earlier and
with a greatly reduced force.

At the end of the Gulf War, seven months after the invasion of Kuwait, the
“premier Army National Guard Infantry Brigade”, the 48th Mechanized, was
still at the National Training Center in California. Air National Guard and
Reserve fighter squadrons, by contrast, are among the most ready and often
defeat their active duty counterparts in fighter competitions. Not only are they
staffed and led by highly experienced pilots, but their years of training together
often gives them tremendous cohesion and esprit. There is no reason why we
could not use this restructuring of our land forces as an opportunity to create
similar armor and mechanized infantry units. (The author, it should be noted,
is a retired Air Force reservist.)

The Airmobile units are highly mobile once they, their equipment, and their
support arrive in theater. As the Task Force Hawk episode shows, however,
deploying these elements to undeveloped areas of the Third World can be a
logistical and training nightmare. This area requires study and experimenta-
tion. We may, for example, want to keep this capability, but transfer it to the
reserve components.

To this point, I have used “land forces” in lower case to indicate that I am not
recommending that as its name. I would personally prefer something like US
Strike Force or US Mobile Force.

This interval is arbitrary, but should reflect how long we think it would take
some threat to develop a credible conventional capability.

For a highly entertaining story of how technology could assist 4GW in the
future, read The Devil’s Footprint by Victor O’Reilly, G. P. Putnam’s Sons,
1996. The weapon called “Dilger’s Baby” is real. For a true story of experimentation in today’s combat environment, see Commander (Now Captain) Dan Moore’s paper on fast OODA loops in Bosnia, “Bosnia, Tanks, and ... ‘From the Sea,’” US Naval Institute Proceedings, December 1994.


132 ibid.

133 Task Force Hawk was the deployment of 24 Apache attack helicopters from Germany to Albania in April of 1999 (during the NATO – Serbian War) to participate in some fashion in our air attack on Serbian forces in Kosovo. By the time the episode ended, we had spent at least $700 million, used 550 C-17 sorties, deployed 10,300 pieces of equipment, moved an entire corps headquarters, crashed 2 helicopters on training missions, and failed to generate one combat sortie. See Dana Priest, “Army’s Apache Helicopter Rendered Impotent In Kosovo,” Washington Post, December 29, 1999. The after-action report issued by TF Hawk’s commander, Brigadier General Dick Cody, is available at http://www.d-n-i.net.


135 The “Lanchester Square ‘Law’” was proposed by F. W. Lanchester in 1916 to describe attrition in early air combat. Roughly, it says that at any moment in time, the loss rate on each side is the product of the number of weapons on the other side times the killing rate of those weapons. After some mathematics, one can show that the “effectiveness” of each side is the killing rate of its own weapons times the square of the number of those weapons. The more “effective” side will attrite the other to zero. What this law actually describes is something like a (piece of a) Civil War skirmish line, where each soldier is in range of all the enemy soldiers and neither side retreats or maneuvers. This is about as far from maneuver warfare as one can get. Despite this, the square law, or something very much like it, lies at the heart of every computerized combat model in use today. For a thorough discussion, see Darilek, Richard, Walter Perry, Jerome Bracken, John Gordon, and Brian Nichiporuk, Measures of Effectiveness for the Information Age Army, Rand Publication MR-1155-A, 2001, http://www.rand.org/publications/MR/MR1155/.

136 Some readers may have noticed that the Strike Force also has a mission of eliminating weapons of mass destruction. Similarly, tactical aircraft operating from the CVNs present a need for joint cooperation. So the Hydra of Jointness has not been completely eliminated but should be shrunk to nuisance dimensions.


For those still determined to increase the U.S. defense budget, note that including the spending of our likely allies (NATO, Japan, Australia) would boost our advantage over a combined Russia-China-“rogue states” threat to roughly five to one. Data are available at http://www.d-n-i.net.

This “fine sense” is, of course, a vital element in the commander’s *fingerspitzengefühl*.


Despite President Bush’s Gulf War boast of being able to hit a bullet with a bullet, there is no evidence to suggest we destroyed even one SCUD warhead. A “successful” Patriot intercept meant that the SCUD warhead simply exploded in a different part of the city. Roughly 10% of our combat casualties in the war resulted from a single SCUD that destroyed a building housing Army reservists in Dhahran, 25 Feb 1991. I was in Riyadh in February 1991 during the last two weeks of SCUD attacks, and the inhabitants thought that our claims of destroying SCUDs were hilariously funny.


Retaining the initiative under any circumstance lies at the heart of Sun Tzu’s strategy. Even momentary lapses can lead to disaster. Griffith has an excellent discussion on p. 41.

108. The “Maginot Line Syndrome” refers to any belief that something will make us safe. It is the exact opposite of the title of Intel CEO Andy Grove’s book, *Only the Paranoid Survive*, Currency (Doubleday), 1996. The “something” can be physical, as in the real Maginot Line built by France between the world wars, it can be a belief in a “core competence,” a simple feeling that we’re smarter than they are (as Hitler felt towards the Soviets in 1941), a belief that spending more provides safety – anything that reduces the sense of urgency and humility that leads one to seek out problems at a very early stage (to “confront the difficult while it is still easy” *Tao Te Ching* (Mitchell), 63).