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NAVAL WAR COLLEGE REVIEW

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Cover

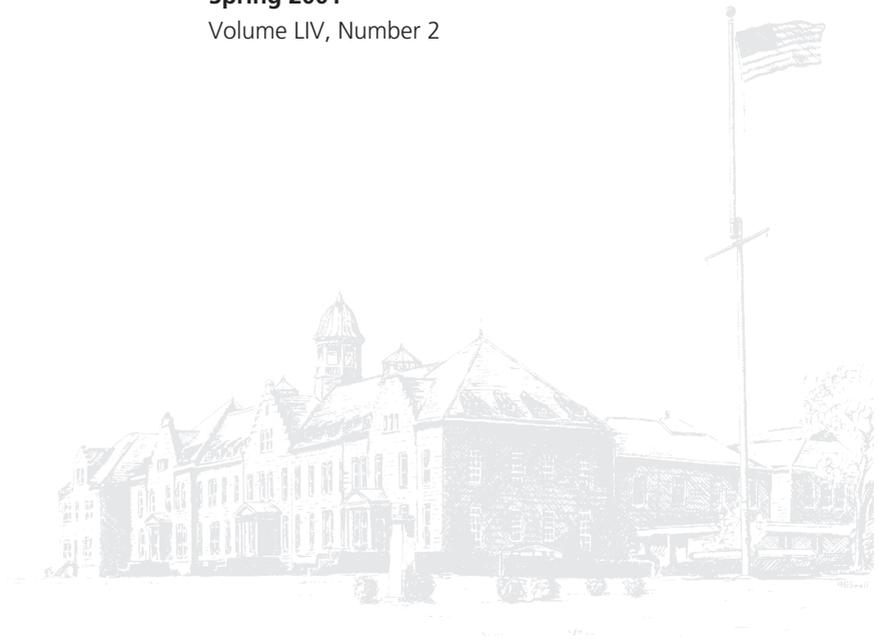
The first large-scale thermonuclear detonation—the 10.4-megaton IVY MIKE test of 1 November 1952, at the U.S. Atomic Energy Commission Pacific Proving Grounds on Eniwetok Atoll in the Marshall Islands. The test was designed to confirm, at the megaton level, the effectiveness of the newly discovered “Teller-Ulam” radiation “trigger,” an advance that made fusion explosions practicable. The explosion was unexpectedly powerful, five hundred times more so than the fission-technology FAT MAN of 1945. It left a crater 164 feet deep and 6,240 feet across where the islet upon which the device rested had been, and it wrecked the unmanned observation equipment on nearby islets. On islands miles away, where scientists had intended to examine birds and trees, etc., to measure biological effects, all animal and vegetable life was simply destroyed. Warships over thirty miles out to sea endured searing heat. The mushroom cloud rose some forty thousand feet and spread out over a hundred miles.

IVY MIKE was not a “bomb” but a test-bed; the Soviet Union made the same breakthrough the next year. Successive tests were devoted to developing serviceable thermonuclear weapons, or “hydrogen bombs,” ultimately producing the vast arsenals that are the subject of one of this issue’s themes—reductions in nuclear weapons. On page 13 begins an exchange of views between Admiral Stansfield Turner, USN (Ret.), a former president of the Naval War College, and two members of the College’s research faculty.

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Vice Admiral Cebrowski commanded Fighter Squadron 41 and Carrier Air Wing 8, both embarked in USS Nimitz (CVN 68). He later commanded the assault ship USS Guam (LPH 9) and, during Operations DESERT SHIELD and DESERT STORM, the aircraft carrier USS Midway (CV 41). Following promotion to flag rank he became Commander, Carrier Group 6 and Commander, USS America Battle Group. In addition to combat deployments to Vietnam and the Persian Gulf, he has deployed in support of United Nations operations in Iraq, Somalia, and Bosnia. He has served with the U.S. Air Force; the staff of Commander in Chief, Atlantic Fleet; the staff of the Chief of Naval Operations, on four occasions; with the Joint Staff (as J6); and as Director, Navy Space, Information Warfare, and Command and Control (N6). Vice Admiral Cebrowski became the forty-seventh President of the Naval War College in July 1998.

PRESIDENT'S FORUM

The Navy has made considerable progress in transformation: it is increasingly network-centric; its offensive firepower is more dispersed and more accurate; and its power can be projected much farther inland. But these advances represent past decisions. Transformation is the continuing process of crafting a new future, one that will find expression in new “tangibles,” used in new ways.

“CHALLENGE THE ASSUMPTIONS!” That is the oft-repeated exhortation of the Chief of Naval Operations, Admiral Vern Clark, to his admirals. From the perspective of a war college or a research laboratory, both under the aegis of academic and intellectual freedom, the task sounds easy. It is far more difficult in execution—yet it is a requirement for organizations under stress.

Before exploring the process and consequences of challenging assumptions, one should ask “Why?” What is the imperative? If the Chief of Naval Operations were comfortable with the current assumptions, if he were confident that they could produce what is required for the emerging national security environment, and if the budget environment were both predictable and adequate, there would be no compelling need to challenge the assumptions of an organization with a long history of sustained superior performance. But none of this is true. The evidence that the Navy cannot continue on its present course and still secure the interest of the nation over the long term is overwhelming. Analysts predict a procurement “train wreck,” not just for the Navy but for all the services. The growth of operating costs has been both large and unpredicted*—and personnel costs are likely to grow even if the economy should slow. It is little wonder that the Chief of Naval Operations asks his admirals to challenge the assumptions.

* For example, in the case of aircraft repair parts: 19.8 percent growth in fiscal 1998, 12.4 percent in 1999, 11.7 percent in 2000, and 14.6 percent so far in 2001.

TRANSFORMATIONAL CHANGE

In deciding which assumptions to challenge, one finds two broad categories. The least interesting assumptions involve neither significant contention nor significant money (consequently, that group almost always is selected for review). The second category represents both contention and money. Clearly, it is this second group in which we should be interested. Within it we find a further division into assumptions that can yield new ways of gaining efficiencies at the margin, and those that involve transformational change. The rest of this discussion will focus on the latter category.

Three common examples of assumptions at the highest level are:

- The national security environment will remain essentially unchanged through 2010 or even longer.
- The defense budget will be flat or increase only modestly through that period.
- The trend toward a networked joint force will continue or quicken.

We need to be exceptionally careful in our assumptions, for if they are not true our strategy will fail. The first and second assumptions should be challenged. The problem with the first is that it defies both history and current observations. The problem with the second is that if the budget falls, the Navy will become prohibitively expensive; and if the budget notably rises, we will miss opportunities, due to our insufficient attention to research and development, concept innovation, training, and acquisition capabilities. Put another way, the second assumption may cause us to “think poor,” and it stems from the first. Because the third assumption is fully under our control, it can be made to come true.

For a helpful way to think about assumptions, consider the relationship between science and technology. Science explores man’s relationship with the rest of creation. Technology, on the other hand, relates human actions to objectives. In the processes of science and technology, two things happen: observations are explained, and “things” are invented. The outcome is that the new explanations and the new things interact, creating new realities. This point gives insight into the process of challenging assumptions. A new concept flows from a new understanding of relationships, and it yields rules pointing to the creation of new tangible things. Attempting continued creation of things in response to older and increasingly discredited explanations of observations results in disharmony and waste, the stress and inefficiency of living a contradiction. Even when the creation of such things yields marginal improvements in performance, the improvements are only in relation to discredited theories and not the new realities. Since man can never fully observe or explain all of creation, this process is

continuous. It is only really noticed when truly large assumptions are challenged, as when Copernicus articulated a new relationship between man's habitat and the rest of the universe.

A modern-day example emerges from information science, best observed in the prevailing marketplace: large numbers of people with high degrees of shared awareness, responding to shifts in basic rule sets in ways not yet fully understood, constitute the modern market. The result is activity that takes us to a future where human behavior is less deterministic and more emergent, less focused on the physical and more on the cognitive, and where value is derived more from relationships than from things. For the military, the question is whether we can turn away from methods and processes that rely on building rigid paths to a predetermined future, and turn instead toward a view that is less deterministic and less focused on the physical.

This new understanding of mankind's relationship with information points us to technology choices. As we move from the industrial age to the information age, the intangibles of war will increasingly dominate outcomes. We are witnessing the "demassification" of the tools of war, with concomitant increases in speed; further, precision will be measured increasingly by reliability and predictability in coupling military operations to political objectives. The trend toward "demassification" is already apparent in the ascendance of precision strike, an information-age concept that relies on knowledgeable targeting and accurate weapons guidance rather than the mere counting of aircraft sorties and bomb tonnages dropped—industrial-age metrics. Also, the rapid targeting used both in DESERT STORM and over Serbia and Kosovo reduced the required mass. Since sources of power are increasingly associated with information, agility, and communications, categories of systems and procedures can be identified for reduction or outright elimination—those that depend on mass, reduce speed, or inhibit shared awareness.

With these examples as guides, we can explore the three avenues of transformational change available to military forces, the Navy in particular. These involve the questions of how to operate the Navy, how to size the Navy, and how to shape the Navy.

Is it possible to change how the Navy operates—or more broadly, how the Navy is used—without changing its size or shape? The principal feature of U.S. naval operations is the sustained projection of American sovereignty, frequently referred to as "forward presence." About this we need to ask, would we want to do less of it in order to save money to be spent elsewhere? Research by Professors Donald C. F. Daniel and Bradd Hayes at the Naval War College points to the importance of forward presence, while acknowledging the difficulty of expressing its value by a meaningful quantified metric. In other words, we know that to do

less is almost certainly bad, possibly disproportionately so—but it is difficult to say by exactly how much. Research by the College’s Professor Tom Barnett on economic and energy development in Asia implies a similar conclusion. Also, the joint combatant commanders clearly want more rather than less naval forward presence. But even if all of these views were wrong, a reduction in forward operations of the fleet would not yield meaningful savings unless portions of the forces themselves were eliminated.

One question, then, is whether presence levels can be maintained or increased with a smaller force level by changing the way the Navy operates. Indeed, there are proofs that the answer is yes—naval forces homeported in Japan, and the Blue/Gold crews of nuclear ballistic-missile submarines, for instance—but since presence forces are also warfighting forces, it is not clear that a smaller force would be prudent. There are ample indications that it would not be. Over the 192 crises of the past thirty years studied by the Center for Naval Analyses, naval forces on their normal deployments dealt with the vast majority. The most notable exception was Operation DESERT STORM, in which additional U.S. naval forces surged from their home ports.

The Navy’s mode of operation, its size, and its shape are interdependent. At the very least, an increase in one draws funds from the others, probably with unintended consequences. The result is that a change in one assumption that we might challenge has effects that cascade into other areas.

For instance, a navy does not hold its shape as its size is decreased: navies do not “scale” well in a downward direction. One need only look at the current U.S. fleet, in which there are virtually no small ships. The dominating cost-benefit rule has been to maximize combat power per dollar in a force of specific size. The result has been upward pressure on unit size and capability, downward pressure on the number of ships, and a general deserting of low-end missions. The result is that the fewer remaining ships have difficulty meeting forward-presence requirements. As low-end training opportunities are lost or underutilized, crews become overspecialized, aggravating the phenomenon that on multimission ships more mission capability is put at risk. The result is that the fleet tends toward tactical instability, by which I mean vulnerability of a force to an adversary that is disproportionately smaller in size and cost, and less sophisticated. A large, costly, multimission U.S. warship that neglects training in one or more warfare areas, such as antisubmarine warfare, may be defeated by a small, inexpensive, single-purpose foe, such as a conventional submarine.

The key assumption we really should challenge is that in a time of rising costs and flat budgets, the Navy must operate less, or reduce its size, or forsake capabilities appropriate for the information age—or all of the above. We should be asking instead, “Can we maintain or even increase forward presence, hold or

increase current size, *and* shape fleet capabilities for the information age, all within the expected budget?" My hypothesis is that by "shaping the force," making the appropriate choices in information-age technology, organization, doctrine, and business processes, the size, the operating levels, and the capabilities of the U.S. Navy all can *increase*.

The boldness of this hypothesis is acknowledged, but there are illustrations that indicate its merit in significant cases. One could replace some of our current and projected amphibious ships with an expansion of the U.S. Army's Theater Logistics Vehicle, employing a variant of the Royal Australian Navy's *Jervis Bay*. This force would substitute speed for mass while delivering more Marines to the objective, at high speed and low cost. Combat power delivered per unit of overhead could be reduced by an order of magnitude. Of course, this would necessitate a change in our concept of amphibious and logistics operations. A similar type of ship could be used for advance-force and special operations. Global 2000 and a limited-objective experiment with Amphibious Squadron 5 have pointed to the promise of this approach. A second example is found in a Naval Postgraduate School concept called SEA LANCE, in which the numbers of ships are sharply increased, their weapon load increases, and the crew size decreases—all within existing costs.

There are other examples. They all challenge doctrine, organization, and technologies that have been undergoing evolution and enhancement since World War II or before. Clearly it is time to look at the new ideas objectively and make the hard choices. But what are the rules by which these choices are to be made?

NETWORK-CENTRIC OPERATIONS

Over the past two years the Navy Warfare Development Command, with the aid of the Naval War College War Gaming Department, has examined and refined a Capstone Concept for the future Navy. The Capstone Concept articulates the U.S. Navy's transformation path to network-centric operations. It applies the defining tenets of joint and naval warfare to network-centric warfighting and establishes a vision of the new capabilities we must achieve. It underscores, in all its aspects, the increasing importance of information as a source of power. Information protection, knowledge management, and networked sensor employment are vitally important to future warfighters. The Navy must be able to fight for and win the information and knowledge advantage early in any crisis or conflict.

Centered on warfighting capabilities and human and organizational behavior, and enabled by evolving technology, network-centric operations can be broadly described as the process of deriving maximum military effect through the rapid and robust networking of diverse, well informed, and geographically dispersed forces. Network-centric operations primarily focus on the operational and tactical

levels of warfare, but they have significant impact across the spectrum of military operations, from diplomatic support and humanitarian assistance to strategic warfare. Network-centric operations represent an emerging theory of war that will harness the power of technological advances to dominate operational tempo and achieve warfighting aims at all levels of military operations. Four major supporting concepts—“pillars”—underpin this new theory.

To gain the information and knowledge advantage, the future joint force will fight first for knowledge superiority, building our own awareness while degrading the enemy's. Commanders have always valued a decisive information advantage over an adversary. “Surprise,” one of the great principles of war, is one generalized example; the breaking of the Japanese code before the battle at Midway is a more specific application. But the power of information in the emerging character of war has elevated the concept of “information superiority” to primacy. Awareness will be gained through multitiered expeditionary sensor grids incorporating autonomous vehicles, robotics, and microtechnology; through officers educated in the history, politics, economics, and cultures of potential adversaries; and through “red cell” networks of regional experts responding directly to operational commanders.

Assured access results from the Navy's ability to destroy or neutralize “area denial” systems, sophisticated and overlapping threats designed to keep U.S. power-projection forces from reaching positions from which they can be effective. The Navy must be able rapidly to establish control of the battlespace—on, over, and below the sea; over the land; and in space and cyberspace—to the degree needed to accomplish any mission, at any level of conflict. The emphasis here is on coping with the changing shape and technical character of the “no-man's-land.”

Effects-based operations shift primary reliance from attrition to a warfighting philosophy that relates physical effects more directly to desired political outcomes. This venerable principle will be manifested by naval forces using combinations of speed and maneuver to influence and degrade an adversary's decision processes. Toward this end, knowledge superiority enables a new era of effects-based operations that can capitalize on early war-termination opportunities that would otherwise be lost. An adversary of modest means requires a prodigious will to undertake the fight. We should expect our forces to shift accordingly from means to will.

The forward sea-based units of the Navy–Marine Corps team are our nation's most efficient, responsive, and sustainable “enabling” forces. Naval forces will continue to exploit the advantages of operating from an essentially borderless domain. Two converging trends are making sea-basing important in joint operations. First, land forces are relying more heavily on sea-based forces for increased agility, support, and survivability. Second, Navy sensors, strike assets,

access capabilities, and command capacities can be projected farther inland. Forward-deployed naval forces can shape the battlespace—by establishing a tiered sensor network; by putting their scalable, interoperable command and control networks at the disposal of joint and coalition forces; and by taking early offensive and defensive actions.

The tenets and pillars of network-centric operations are essential to fielding a Navy–Marine Corps team capable of performing the wide range of future missions necessary to maintain U.S. maritime supremacy. But the Capstone Concept is exactly that, a concept. It is more like science than technology, in that it indicates a critical change in our relationship with our environment. It points to specific requirements—the sensors, networks, weapons, platforms, and most of all, the people who will populate new generations of forces and execute the emerging doctrine. While the intangibles increasingly dominate outcomes, new tools are required to effect the transition to the new theory of war; as a 1998 RAND Corporation study concludes, a transformation requires not only challenges to the way competencies are pursued but also changes in the “tangibles.” The Navy has made considerable progress in transformation: it is increasingly network-centric; its offensive firepower is more dispersed and more accurate; and its power can be projected much farther inland. But these advances represent past decisions. Transformation is the continuing process of crafting a new future, one that will find expression in new “tangibles,” used in new ways.

If, rather than accepting limiting assumptions, we insist that we can maintain or even increase forward presence, hold or increase force size, and shape fleet capabilities for the information age, many of today’s assumptions will have to be discarded. We have only begun to take up the charge of the Chief of Naval Operations to “Challenge the assumptions!”



ARTHUR K. CEBROWSKI

*Vice Admiral, U.S. Navy
President, Naval War College*

*Admiral Turner attended Amherst College and then the U.S. Naval Academy, from which he graduated in 1946; thereafter he earned a master's degree in philosophy, politics, and economics from Oxford University as a Rhodes Scholar, and studied at the Harvard Business School. Before promotion to flag rank in 1970, he served in destroyers (including off Korea and Vietnam) and in shore assignments including duty as executive assistant and naval aide to two Secretaries of the Navy. As a rear admiral he commanded a Sixth Fleet carrier task group; from 1972 to 1974, as a vice admiral, he was President of the Naval War College, where he instituted fundamental and enduring curriculum changes. Thereafter he commanded the Second Fleet/Nato Striking Fleet Atlantic and, upon promotion to full admiral, was Commander in Chief, Nato Forces in Southern Europe. In 1977 President Carter appointed Admiral Turner as the Director of Central Intelligence, a post he held until 1981. Since then he has taught at the U.S. Military Academy, Yale University, and the University of Maryland. Admiral Turner wrote this article while serving as the Raymond A. Spruance Distinguished Fellow at the Naval War College in the fall academic term of 2000. His books include: *Secrecy and Democracy: The CIA in Transition* (1985), *Terrorism and Democracy* (1991), *Caging the Nuclear Genie: An American Challenge for Global Security* (1997, winner of the 1998 Foreign Policy Association Medal), and *Caging the Genies: A Workable Solution for Nuclear, Chemical, and Biological Weapons* (1999).*

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THE DILEMMA OF NUCLEAR WEAPONS IN THE TWENTY-FIRST CENTURY

Admiral Stansfield Turner, U.S. Navy (Ret.)

For over thirty years the United States, Russia, and others have been attempting to limit, control, and reduce the nuclear weapons in the world. These efforts have resulted in a number of bilateral and multilateral treaties, and the number of these weapons has been reduced markedly. As a result, we tend to believe we are making good progress. That is the case relative to where we were. In the absolute, however, we are doing very poorly. There are still more than thirty thousand nuclear weapons in the world; we have just seen proliferation of these weapons to India and Pakistan; the risks of even further proliferation seem high; and the nuclear treaty process is in limbo. Without both a new sense of urgency and a more imaginative approach to controlling nuclear weapons, we risk letting the world become one of proliferation to irresponsible nations and groups that could easily be tempted to employ those weapons in anger for the first time since 1945. If the two nuclear superpowers continue to need tens of thousands of nuclear warheads, as both profess to, other nations of the world will say they need them as well.

The genesis of the problem can be summarized in the numbers of U.S. nuclear weapons on three particular dates. Immediately after the attack on Nagasaki on 9 August 1945, the United States possessed no nuclear weapons; it had at that point expended the only two it had built. The nation did not know quite what to do about that situation; it even proposed to the United Nations that a way be found to prohibit the new weapons. Joseph Stalin would not even consider the idea; in 1949—by which time the United States had about two hundred nuclear weapons—the first Soviet test detonation was conducted. That began a race, a spiral that produced a peak on the American side in 1969, at some 32,500 nuclear warheads.

That had to have been an irrational process. How could Americans possibly have thought they could use 32,500 nuclear warheads? After all, there were less than two hundred cities with populations of more than a hundred thousand in the Soviet Union.

But to put the enormity of these weapons into even sharper perspective: all Americans had seen post-attack pictures of Hiroshima; they knew that some 140,000 people had died there. The twelve-kiloton Hiroshima weapon had had a blast effect alone equivalent to some twenty-five million pounds of TNT—that’s *million*. It also had, of course, other effects—radiation, heat intense enough to cause fires, and electromagnetic pulse. Further, a nuclear attack on a city causes severe societal disruption: communications that had passed through Hiroshima no longer did, affecting many other cities; products from Hiroshima’s factories never went anywhere, affecting other factories around the country.

However, the matter needs to be put in context; not all the nuclear weapons that the United States has built since then have been the size of the Hiroshima bomb (see table 1). The smallest type was an artillery shell, but even that was a hundred times as powerful in blast effect as a modern large (two-thousand-pound)

conventional bomb. Recently the Senate Armed Services Committee talked of developing a rather small nuclear device that might be useable in circumstances in which the nation would not think of using a huge weapon; the smallest one it considered would have five thousand times the blast

effect of a two-thousand-pound bomb. Today, the standard weapon in the U.S. arsenal that could quickly be aimed at Russia (both sides having “detargeted” their ballistic missiles in January 1994) is 250,000 times as powerful as a two-thousand-pound bomb. The standard Russian weapon is the equivalent of over a billion pounds of TNT—over six hundred thousand times the power of a two-thousand-pound bomb.

CONVENTIONAL THEOREMS, SPECIOUS REASONING

How in the world did this nation ever get to 32,500? The primary reason is that the United States has always treated nuclear weapons as though they were simply larger conventional weapons. More specifically, the basic mistake was to apply

TABLE 1
LETHALITY INDICATORS FOR NUCLEAR WEAPONS

Warhead (kilotons)	Use	TNT Equivalent (pounds)	Comparison to 2000-lb Bomb
0.1	artillery	200,000	100X
5	Senate proposal	10,000,000	5,000X
12	<i>Hiroshima</i>	25,000,000	12,500X
250	U.S. ICBM	500 million	250,000X
550	Soviet ICBM	1.2 billion	605,000X

Plus: radiation, heat/fires, EMP, societal disruption

certain theorems of conventional warfare to nuclear warfare, producing four misleading concepts:

- The importance of a rough parity in numbers of weapons
- The possibility of deterring an opponent from initiating nuclear war by threatening some specific set of targets
- A “window of vulnerability” for both sides
- The stated willingness, even today, of the United States to initiate nuclear war.

Numbers

In conventional warfare, numbers are important. No one wants to have fewer tanks, infantry, or airplanes than an opponent—a valid enough proposition. In nuclear warfare, however, where weapons have blast effects equivalent to hundreds of millions of pounds of TNT, it ought to be obvious that the point of diminishing returns sets in quickly.

The author once had the opportunity to ask Robert McNamara, who was secretary of defense from 1961 to 1968, how the United States accumulated over thirty-two thousand nuclear weapons. The U.S. government, he explained, would periodically receive intelligence reports that the Soviets were starting new nuclear-weapons programs, apparently with the aim of either catching up with or exceeding the American arsenal; each time, the United States would build new systems of its own to counter them. The Soviets, in turn, would learn that the Americans were building new weapons; they would start new programs to counter *them*—and on we went, spiraling upward.

Target Sets

McNamara tried to arrest this spiral by limiting the strategic arsenal to the size necessary to destroy a given percentage of the Soviet industrial capacity and population in order to deter the Soviet Union from starting a nuclear war. The percentages he chose were indicative of how far astray strategic thinking had gone; they were absolutely enormous, something like 40 percent of the Soviet Union’s industrial capacity and 25 percent of its population, between six and seven thousand targets in all. It boggles the imagination to think that in the 1960s the United States believed that it needed a destructive capacity of such size to deter the Soviet Union. Both nations had bought into a specious reasoning according to which the important thing was parity in numbers of weapons, an assumption resulting in an ultimate inventory between them of some seventy thousand nuclear weapons.

Even so, by 1969 it was obvious that something was badly wrong. American political leaders were loath simply to reduce numbers of U.S. nuclear weapons,

probably for fear of appearing weak vis-à-vis the Soviet Union. Instead, by the 1970s, they had started the nation on a path of nuclear arms control agreements.

How could Americans possibly have thought they could use 32,500 nuclear warheads?

At the same time, U.S. strategic planners began to shift away from industrial capacity and population to military targets, selecting

those they thought vital to deterrence and assigning forces to attack them in what was known as the Single Integrated Operational Plan, or SIOP.

My first encounter with the enormity of all of this came in the early 1970s, as commander of a carrier task group in the Mediterranean. I had had no experience whatsoever with strategic nuclear matters, but I now had command of a force that possessed strategic nuclear weapons. I sent for a pilot of an A-6 Intruder, the primary U.S. carrier-based attack aircraft of the time, and his bombardier/navigator. “Bring me,” I told them, “your target folder and tell me what you do if I’m ordered to order you to release your nuclear weapon in accordance with the SIOP.” The two young men came into my cabin, opened their target folder, and said, “Here is our target, Admiral.” I noticed first of all that it was in Bulgaria. *Bulgaria?* I couldn’t say so to these people who might have to risk their lives to carry out this plan, but in a major nuclear war, with thousands of warheads going off all around the world, why were we going to worry about Bulgaria?

The target was a railroad bridge across a river. The folder had a photograph of it, but all I could see was railroad tracks coming down to the north side of the river, and more tracks going away from the south side. “Unfortunately, Admiral,” the bombardier explained, “the bridge is too small to be seen in this photo.” I came away with the conviction that if we had sufficient nuclear weapons to hit an invisible bridge in Bulgaria, we were overstocked. Yet today the United States still has six thousand nuclear warheads aimed at Russia. The Joint Chiefs of Staff say two thousand is about as low as they can go. These are such enormous weapons that it is amazing people still think in such terms.

Deterrence

How should we calculate what it takes to deter? First of all, deterrence is in the eyes of beholders—what they *think* is going to happen. If they are dealing with the very survival of their societies, they have to assume the worst. The worst would be the other side hitting cities, destroying the society and its population. In that case, it makes no difference what is put in the target set. Strategic planners theorize, even agonize, over targeting, but it does not matter: the other side necessarily assumes that its cities will be targeted.

The question, then, is, how many Russian cities does the United States have to threaten in order to deter the Russians? To make a rough calculation, let us put the question the other way around: how many cities in the United States does

The United States has always treated nuclear weapons as though they were simply larger conventional weapons.

Russia have to threaten to deter us? Imagine the president of the United States appearing on television to tell the American people, “There is no longer a threat of

major nuclear war. I have knocked out the entire Russian nuclear capability—and all I lost was New York City and two hundred thousand people.” If there was ever a time when Americans might have thought that would be a suitable exchange, would they today, with Russia in the straits in which it now finds itself, politically, economically, and militarily? No. The United States is deterred by the prospect of even a *single* nuclear detonation on its soil.

Yet our nation has continued with this specious line of reasoning—that it must be able to destroy some given (large) number of targets. Does it really take six thousand warheads, or even two thousand, to deter Russia? No. It probably takes the same number as it does to deter the United States—one. But let us play it safe. Call it five or ten, or some such number—still, it will not be in the hundreds or thousands. The point is to make Russian “beholders” feel certain that if they start a nuclear war with the United States they will suffer five or ten nuclear detonations on their cities in return.

To “size” a nuclear arsenal, though, one also has to ask how large a force would be needed if one ever had to retaliate. It is difficult even to imagine what would happen—if a nuclear war begins, everyone has already lost. It will not make any difference whether we ultimately do more damage to our opponent, the aggressor, than has been done to us; the damage to our own country will have been so great that we will have lost, too.

Still, we can bound the problem, at least on the upper side. A group at the Massachusetts Institute of Technology did a study in 1987 hypothesizing 239 Soviet nuclear detonations on the liquid-energy supplies of this country—the port terminals, oil storage facilities, pipelines, and so forth. It found that two years later, 60 percent of the U.S. population would have died of starvation, because food could not be shipped. At the end of six years, gross domestic product would have been only 40 percent of what it had been before the war. Roughly two hundred warheads, then, is probably more than enough retaliation to set any society back to what we may call its point of nonrecovery, at which it can never again be what it had been.

Windows of Vulnerability

The idea of possessing only two hundred warheads, however, is very difficult to sell; many strategic planners have strong objections. The first is the familiar idea of the “window of vulnerability”—that a first strike by either side could totally disable the nuclear capability of the other side. This has always been a canard. For over thirty years, ballistic-missile submarines, SSBNs, capable of launching thousands of nuclear warheads, have been at sea, where they are virtually invulnerable. Even beyond that insurance is the phenomenon that Clausewitz called “friction”—in warfare, nothing ever succeeds completely. Even if there were nothing but land-based intercontinental ballistic missiles (ICBMs), a side that tried to knock them all out would be lucky to destroy 90 percent.

The United States once had a thousand ICBMs; a 90 percent effective strike would still leave a hundred deliverable weapons. An attack that was 99 percent effective—and no one in the military would ever imagine achieving 99 percent success in any kind of an attack—would leave ten ICBMs intact, which with three or more warheads each would be enough to deter, if we accept that deterrence at low numbers is valid.

First Use

There is still another objection to the United States limiting itself to very low numbers of nuclear weapons—that it may *want* nuclear weapons with which to initiate nuclear war. In 1952, the United States declared that it would employ nuclear weapons to defend its Western European allies against a conventional attack, if necessary. This was called “extended deterrence.” It was never a military strategy but a budgetary one: it was a way to excuse the Europeans from building large enough conventional forces to defend themselves. The Western Europeans did not want a nuclear war on their rather limited geography, so they spoke of an “umbrella,” a nuclear umbrella, over it. By this they meant that if the Soviets invaded and conventional fighting in the area protected by the umbrella went badly, the United States would launch nuclear weapons—its own weapons, firing them over that umbrella, against the Soviet Union. Thus all the nuclear devastation would be in the United States or the USSR, outside the umbrella. The Americans looked at it rather differently. “If the war goes badly inside this umbrella,” an American would have said, “and if the Europeans want us to, we’ll launch tactical nuclear weapons from Western Europe to Eastern Europe. Of course, there may be retaliation, but all the nuclear devastation will be inside Europe, inside the umbrella.”

Today, fortunately, defending Western Europe is no longer a problem. Accordingly, U.S. strategic planners have conjured up new contingencies in which the United States might wish to initiate nuclear war:

- To preclude the revival of a Soviet-type threat to Europe
- To respond to the use of biological weapons against U.S. forces
- To destroy underground headquarters, weapons, or weapon storage
- To repel a cross-Straits invasion of Taiwan by a force of massed Chinese junks
- To repel a massive Chinese ground attack on South Korea
- To respond to, and thus deter, any sort of heinous act against the United States.

There is no question that in every one of these instances—one might think of others—a nuclear response would be more efficacious militarily than a conventional one. But to consult Clausewitz again, war must have a political objective, and it must not be waged in a way that defeats its political objective. This is hard for people of the World War II generation to accept, having been raised in an era of unconditional surrender. And subsequently we learned the wrong lesson from Vietnam—that the military should never again let politicians pick targets, as Lyndon Johnson did in that war. But who picked the targets in Kosovo in 1999? The political implications of targeting in Kosovo were so clear that any military objections were very muted.

How is it, then, that planners today argue that the United States might use nuclear weapons in these six cases simply because they would be more effective militarily? This is sloppy thinking—it overlooks the fact that political objections will prevail. First, in all these instances (with the possible exception of contagious biological weapons), a nuclear response would be considered disproportionate. Second, it has been over a half-century since nuclear weapons were used; the uncertainties involved in unleashing them again would seem too great. Third, it is not melodramatic to point out that at the extreme, the survival of humankind would be at risk. That a president of the United States would take the moral responsibility of opening this Pandora's box, not knowing where events could lead, is beyond belief. Finally, and fortunately, alternatives are becoming available—in the form of precision guided munitions (PGMs), as well as such devices as remote-targeting systems that make PGMs easier to use.

If planners insist that the nation might willingly use nuclear weapons in scenarios like those above, precision conventional capabilities specifically tailored to deal with them will not be developed. Take the cross-Straits invasion of Taiwan, for instance; to land a force of the size that would be needed, the People's Republic of China might have to send waves of wooden-hulled junks. It is very difficult to sink a junk; to stop such an invasion, a specialized munition that would go through a wooden hull and kill everyone inside would be very handy.

But such a thing cannot be conjured up at the last minute. It has to be thought about in advance, beginning with the understanding that the incremental military advantage of using nuclear over precision guided weapons in such a case would not be worth the political cost.

GETTING TO TWO HUNDRED: STRATEGIC ESCROW

The United States, then, does not need a reserve of nuclear weapons to take the offensive; and something in the neighborhood of two hundred nuclear warheads will do for deterrence and retaliation. How would we safely get down to a nuclear arsenal of something like two hundred warheads? Today, the most imaginative approach is to finish the second Strategic Arms Reduction Treaty (START II), which takes each side down to 3,500 nuclear warheads (see table 2), and then perhaps negotiate another agreement that will reduce warheads to two thousand, or lower.

There are problems here. START II is stymied. The Russian Duma has passed and ratified it, but with caveats concerning American national-missile-defense

developments. There is not much chance that the U.S. Senate (which ratified the treaty in an earlier form in 1996) will accede to such reservations. Even if ratified in the same form by all parties, START II is too slow; if it went into effect today, the reduction to 3,500 would be completed only in 2007.

TABLE 2
U.S. NUCLEAR WEAPONS

Date	Number	Remark
16 August 1945	0	Two expended
1949	c. 200	First Soviet test
1969	32,500	Peak
1989	6,000	START I target
1993	3,500	START II target
2000	2,000	JCS minimum/START III

Too much can happen between now and then, as the Russian scene changes, and as the Iraqs, Irans, and North Koreas of the world aspire to nuclear capabilities.

In any case, the 3,500 figure, which is so often invoked, is phony. The treaty covers only nuclear warheads actually mounted on delivery vehicles. The United States has said that in addition to the 3,500 permitted by the treaty it would also keep 3,500 spares, which of course could be mounted on multiple-warhead vehicles, and it has indicated that it will keep 3,000 *tactical* weapons, which are not covered by the treaty at all. That makes a total of 10,000. Proportionally, if a START III treaty reduced “covered” U.S. warheads to two thousand, the nation would in fact possess five thousand. These reductions, whatever numbers we choose, do nothing significant to reduce the threat to this country. If five hundred nuclear weapons were launched against us, we would be just as dead as if two or three thousand had been.

What can be done that would be more effective? One approach is called “strategic escrow.” The president would begin by directing the U.S. Strategic Command to take a thousand warheads off its ICBMs and put them in storage not less than three hundred miles away. The president would invite the Russians to send observers—not controllers—to count what goes into storage and remain to see what goes out. Ideally, the Russians would reciprocate; in fact, they would

I came away with the conviction that if we had sufficient nuclear weapons to hit an invisible bridge in Bulgaria, we were overstocked.

have to. Most reports—including from Russian sources, borne out by a statement by President Vladimir Putin—indicate that the Russians today are nearly down to a

thousand usable intercontinental nuclear warheads. This is because since the collapse of the Soviet Union they have not been refurbishing and replacing them. It is in our interest in fact to get the size of the U.S. arsenal down to that of the Russians because a growing disparity in numbers of usable warheads could make the Russians feel so insecure that they might place their remaining nuclear weapons on hair-trigger alert. Given American initiatives and Russian reciprocation in a program of strategic escrow, in a matter of four to five years both sides could be down to something like a thousand deliverable, ready warheads.

At that point, an arrangement would have to be negotiated with the other six nuclear powers to create a “condominium” by which each of the eight states would ultimately keep no more than two hundred warheads, *all of them in escrow*—none of them ready to fire, all of them subject to international verification. Further, they would agree to work together to prevent the proliferation of these weapons to other nations, including sharing intelligence information. Under the condominium regime, there would be no nuclear weapons in the world immediately ready to fire. The international observers at the storage sites would warn if any one of the eight nuclear powers prepared weapons for use. At the same time, any of the eight could bring weapons into readiness as a threat against any other nation that acquired a nuclear capability and began threatening others with it.

The nuclear nations would move into this condominium state in a gradual way, undergoing quite intrusive United Nations inspections. These nations would not need to expose themselves to a surprise, disabling attack, even if some other nation sequestered a few hundred warheads during a transitional period. But then, squirreling away, say, two hundred nuclear warheads ready for use is not a simple proposition; it means somehow hiding the same number of ICBMs or other delivery vehicles, in addition to warheads. A nation considering doing so would still face friction; even a two-to-one advantage does not guarantee total protection.

This process could produce a very stable world. If a Saddam Hussein acquired a nuclear warhead and started threatening to use it, the nuclear nations would simply bring warheads back from escrow. By acceding to the condominium the nuclear powers would be telling each other, and the world, that though they were not agreeing to abolish nuclear weapons, because it is impractical at this point (though a condominium would be an achievable milestone on the path to that desirable goal), they were accepting zero reliance on these weapons, zero readiness for their immediate use, and zero chance of delivering a surprise attack. A condominium will not lessen the lust of rogue leaders for nuclear weapons, but it should temper the willingness of others to aid and abet their attempts to obtain them. For instance, such a dramatic move on the part of the United States and Russia would pressure third parties to put their economic interests after global security as well, by not selling materials of use in a nuclear program to rogue states. Presently, our country, with its hoard of excess weapons, does not appear serious about preventing proliferation and therefore does not get the cooperation we need.

Of course, a Saddam Hussein may still use a weapon if he has one, but he will have to take into account the hundreds of weapons poised out of his reach, able to eliminate his country if their owners so decided. That is not a guarantee that he will not deliver a nuclear attack, but it is as good as probably can be done.

If there is a reasonable alternative to a strategic escrow/condominium arrangement, it certainly is not traditional arms-limitation agreements. The START treaties are moribund; the United States has antagonized not only Russia and China but a number of its allies, and it has no national missile defense program; the United States has also expressly rejected the Comprehensive Test Ban Treaty. These actions have killed the momentum of nuclear arms control and brought U.S. leadership in this area into serious question.

A VERY DIFFERENT WORLD

There is an urgent need to move away from where we are. Why? We see a number of ominous signs. Plainly, no one can tell where Russia will be in five or ten years. So far, apparently no Russian weapons or fissile materials have leaked out, but observers are worried; there could be much greater cause for worry if conditions deteriorate further in Russia. In South Asia there is an unprecedented inflammatory situation—two nuclear powers, Pakistan and India, who from time to time go to war with each other. As for the Middle East, since December 1998 there have been no UN inspectors in Iraq. When inspectors first went there in 1991, they estimated that Iraq was only months away from a nuclear capability. How far away can Iraq be now? Finally, there is evidence that Iran and North Korea have been moving toward nuclear weapons as well.

What these developments portend is a world in which nuclear weapons proliferate into the hands of someone who will actually use them. Given Iraq's intense rivalry with Iran and animosity to Israel, proliferation to Saddam Hussein would mean the possibility of at least occasional use of nuclear weapons. This would produce a very different world than the one we now live in. The attack might not be on the United States, but it would change all the relationships between humans and between nations: all dealings between them would be clouded by the risk that a breakdown in relations could lead to nuclear devastation.

The world badly needs some imaginative approach like a condominium of the nuclear powers under strategic escrow. It will not get one without rejecting the propositions of conventional warfare that in decades past were transposed into the nuclear era. In short, it is mandatory that the specious reasoning that has underlain nuclear policies for over fifty years be corrected. The United States must lead the world in this direction to forestall an era of occasional use of nuclear weapons. After all, it was the United States that introduced these weapons. Beyond that, it is the only nation today with the stature, power, and wisdom to manage a new nuclear-weapons regime.

One hopes that at war colleges today professors are teaching, and students are learning, not simply contemporary facts but how to reason and analyze through problems like this one better than the generations before have done. The United States must deal with the nuclear problem in a much more rational way than it has. If it is to do that, military officers, whether or not their duties take them into this arcane field directly, must keep intellectually involved in this issue; the collective impact of their thinking, speaking, and opinions will have an effect in the future. The nation needs to be brought to understand that nuclear weapons are generically different from conventional weapons. They are too powerful to be used for anything but deterrence or—God help us—retaliation.



WHAT DETERS? STRENGTH, NOT WEAKNESS

Roger W. Barnett

In the turbulent years following the great Allied victory in World War II, the policy agenda for U.S. leaders overflowed. Demobilizing millions of servicemen and shifting the economy to a peacetime footing were among the vital orders of the day. Yet the Cold War was dawning, and the military services—including the newly constituted U.S. Air Force—were maneuvering for position. An entirely new strategy had to be crafted in the wake of victory and for what was to be called the “atomic age.” Scientists, military leaders, academics, civilian analysts, and politicians lined up to offer their theories about the proper place of atomic weapons in the new strategies being proposed. Everyone was sailing into uncharted waters, without benefit of stars or reliable compasses.

One could argue today that with respect to nuclear weapons and nuclear strategy American leaders got it right, or mostly right. After all, there was no nuclear war, and after a bitter struggle the nation’s major competitor, the Soviet Union, disappeared from the scene. No doubt some excesses resulted from the competition between the superpowers, but they can be understood, even excused, when one reflects on the deep hostility that existed between the two systems. Secrecy and suspicion about intentions inflamed the relationship and motivated the competitors to seek security in large arsenals of weapons, especially nuclear weapons.

Now, in the post–Cold War world, American leaders find themselves looking again for navigational aids to guide them to safe waters. In “The Dilemma of Nuclear Weapons in the Twenty-first Century,” Admiral Stansfield Turner has offered a chart and some sailing directions. Briefly, “The Dilemma” argues that:

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Nuclear weapons are extraordinarily powerful, qualitatively different from conventional explosives;

An arms race caused the Soviet Union and the United States to acquire unnecessarily large inventories of nuclear weapons;

In any conceivable contingency, however effective nuclear weapons would be militarily, their use would be too risky;

No attempt at a first strike could ever destroy enough enemy weapons to prevent retaliation, the results of which would be unacceptable, since the United States is deterred from a nuclear attack by the prospect of even a single nuclear detonation on its soil, and other states are undoubtedly deterred by the same considerations;

There are too many nuclear weapons in the world—reductions in U.S. and Russian nuclear arsenals promised by START II to 3,500 warheads are not deep enough and are too slow in any case;

“Strategic escrow”—removing ICBM warheads and storing them not less than three hundred miles from their launchers—should be initiated unilaterally by the United States, an action that in this view the Russians would be obliged to reciprocate;

In four to five years Russia and the United States would have only about a thousand warheads in strategic escrow;

The other six nuclear powers would then be invited to join a condominium in which each would place in escrow all of its nuclear weapons, no more than two hundred per country, under an international inspection regime;

The result would be a very stable world, in which the probability of surprise nuclear attack would be zero, nuclear proliferation would be discouraged, and momentum toward arms control would be restored.

The pivotal concept in this scheme is “existential deterrence.” The approach and the term were coined almost twenty years ago by McGeorge Bundy, who argued that so long as one maintained the ability to deliver a nuclear retaliatory response to an attack, deterrence would succeed.¹ The mere existence of a response, which would inevitably cause unacceptable damage to the aggressor’s homeland, would deter nuclear attack. The proposition was attractive: it implied that deterrence was stable and that it could be ensured by small nuclear forces.

The enormous power of nuclear weapons, setting them qualitatively apart from other weapons, made existential deterrence possible. The vast uncertainties of system reliabilities, accuracy, survivability, and strategies such as “launch

on warning” shored up convictions on all sides that at least one retaliatory weapon would detonate on the aggressor’s soil. No prospective attacking nation could believe that its nuclear-armed adversary could be totally disarmed as the result of a first strike; some small number of retaliatory weapons would reach their targets—and the prospect of horrendous consequences would suffice to deter.

In his review (entitled “I Exist, Therefore I Deter”) of Bundy’s argument, Lawrence Freedman called the argument “immensely seductive,” in that “forces

Even with large, ready nuclear forces, deterrence can fail. It would be the height of irresponsibility to believe, and to act on the belief, that deterrence cannot fail.

are to be judged by essentially negative criteria: they should not be vulnerable, provocative, disruptive of arms control, or prone to accidental detonation. So long as these criteria are met it does not matter

what is procured, where and in what numbers it is deployed, and against what it is targeted.”² But are such criteria—and the argument that is founded on them—valid?

If, indeed, nuclear-armed adversaries believe that a single nuclear detonation on their territory would negate any possible strategic objectives they might have, the logic of existential deterrence is persuasive. Bundy’s “Existential Deterrence” and the central theme of “The Dilemma,” however, contain five severe, even debilitating flaws: if its key assumption is wrong, this brand of deterrence could fail catastrophically; the possibility of the United States extending deterrence to its friends, allies, and those at risk of nuclear coercion would be nullified; the prospects of the use of weapons of mass destruction against U.S. and allied forces would increase; it not only weakens nuclear deterrence but *encourages* the proliferation of nuclear weapons; and if increased national security is the objective of the scheme, the proposal, by focusing on weapons—one of the *means* of warfare—addresses the wrong issue.

First, then, the question must be asked: What if the key assumption is incorrect? While the prospect of “five or ten” nuclear explosions on its territory might well suffice to deter the United States, what if adversaries have different perceptions and dissimilar thresholds of pain?

The central premise of “The Dilemma” is rooted in unabashed mirror-imaging: “I believe A; you are a rational person, so you must also believe A. The logic is so strong that I require no evidence on which to base my conclusion.” This is a curious approach from the former director of the Central Intelligence Agency. It claims that in order to infer the intentions of others, one need look no farther than one’s own. If that were true, why would the United States need the CIA, or

for that matter, any intelligence agency? If one can mirror-image in this, the most vital of circumstances, with national survival at stake, why not in all lesser cases?

The historical record indicates that belligerent states have often been able to absorb great amounts of punishment. The premise of existential deterrence is that attacks with nuclear weapons will be deterred confidently by the prospect of a small retaliatory response. But how does that square with the ability of Germany and Japan to fight on through devastating aerial bombardment in the Second World War? States have withstood levels of destruction approaching those claimed to underwrite mutual assured destruction, which “The Dilemma” cites as “something like 40 percent of the Soviet Union’s industrial capacity and 25 percent of its population.” Indeed, by the Treaty of Brest-Litovsk in 1918, the fledgling Soviet Union lost “34 per cent of her population, 32 per cent of her agricultural land, 54 per cent of her industry, and 89 per cent of her coal mines.”³ In a more recent example, “UNICEF indicates that at least 300,000 Iraqi children have died from illness, hunger, and disease as a result of the sanctions imposed after the Gulf War. . . . [O]ther sources go as high as 1.5 million Iraqis.”⁴ This carnage has resulted from Saddam Hussein’s intransigence in refusing to comply with UN Security Council resolutions; it is totally avoidable. Given these reports, can one have high confidence that the prospect of a small number of nuclear detonations on Iraqi soil would be sufficient to deter Saddam, or others like him, from a nuclear attack? Do the statements of Muammar Qadhafi—“If we had possessed . . . missiles that could reach New York—we would have hit at the same moment [of the 1986 U.S. raid on Libya]. Consequently, we should build this force so that they and others will no longer think about an attack” —indicate that he would be deterred?⁵ Does North Korea’s pursuit of nuclear weapons and long-range missiles to deliver them argue that Kim Jong-il would be deterred from using them by the prospect of a nuclear detonation on North Korean soil?

We cannot possibly know the answer to these questions. We know that potential adversaries are pursuing nuclear weapons and long-range delivery means. We know also that nuclear deterrence has not failed—but that does not mean it cannot. It might be true that “I Exist, Therefore I Deter”; but it might not. The risks are of the greatest magnitude, however, and so are the possible consequences. Existential deterrence is a prime example of a very risky and dangerous approach to nuclear deterrence—for if it fails, it fails catastrophically.

One can agree that the detonation of a few nuclear weapons on American soil would be the greatest disaster this country has ever experienced without taking the leap of faith that one’s adversaries or potential adversaries would have the same attitude. With no confirming evidence, believers in existential deterrence project their beliefs and fears on others, reaching the conclusion that all must

reason similarly. One is free to wonder, though, why the large risks involved should be deliberately assumed.

During the 1960s and early 1970s, at the high point of the superpower nuclear arsenals, the United States measured “how much was enough” by the rubber ruler of “assured destruction.” The assured-destruction criterion was

To relinquish all weapons of mass destruction would be to declare “open season” for their use against the U.S. military.

that nuclear forces had to be large and robust enough to hold a specified, significant fraction of Soviet population and industry at risk in a retaliatory strike—that is, after

having absorbed a Soviet first strike.⁶ Yet the point continued to be reinforced that the enemy’s prospect of certain loss had to be high if deterrence was to be reliable.

Moreover, deterrence is strengthened by availability. Would a prospective robber be more likely deterred by a gun pointed at him or by one upstairs in a dresser drawer? As Sir Michael Quinlan counsels, “Weapons deter by the possibility of their use, and by no other route.”⁷

Small numbers invite malefactors to find ways to nullify them. In the case of nuclear escrow, the small number of warheads would be in known locations, because they would have to be monitored. It does not take a great amount of imagination to think of ways to nullify small numbers of unusable warheads at known locations, and the payoff from doing so would be very high; the temptation to acquire the capability to negate the escrowed weapons (or their owners’ ability to unite them with their delivery vehicles) could be irresistible.

In the final analysis, “a hundred weapons are not far more acceptable politically, more virtuous morally, safer, more stable in security terms, or even necessarily many times less expensive than, say, a thousand.”⁸ The difference between the approach taken by “The Dilemma” and one arguing that deterrent weapons must be usable and numerous is that the former is based on an assumption that deterrence cannot fail, and the latter on an assumption that it can. The prudent course is clearly not the one suggested by “The Dilemma.”

The second key criticism of an embrace of existential deterrence is that it contains no provision for *extending* deterrence. Since the middle of the twentieth century the United States has provided a nuclear shield to its allies. Nato and the Pacific allies (South Korea, Australia, and Japan, for example) have been the clear beneficiaries of this policy. Further—and in direct contradiction of the claim of “The Dilemma” that extended deterrence was “never a military strategy but a budgetary one”—the United States provided the ultimate earnest of its commitment to its allies: U.S. service members stationed forward. Unless one is prepared cynically to insist that the U.S. fighting forces, hundreds of thousands strong, stationed in allied countries were merely sacrificial tokens rather than

couplings to the American strategic nuclear capability, one must consider that extended deterrence was a genuine commitment on the part of the United States to the defense of its allies.⁹ In the arrangement espoused by “The Dilemma,” where nuclear arsenals would be held in escrow and could be used only in retaliation for a direct attack on one’s home territory, extended deterrence could not function.

The third criticism asserts that if all nuclear weapons are placed in escrow, adversaries will be strongly tempted to use not only nuclear weapons but chemical, biological, or perhaps radiological weapons against U.S. forces in case of conflict. Given that American conventional forces are superior to all others in the world and that the nation appears to intend to preserve that superiority in the future, those who would engage U.S. forces militarily will be obliged to seek leverage in asymmetric ways, to level the battlespace. One such asymmetric method would be to employ varieties of weapons of mass destruction. With nuclear weapons in escrow and unusable except in the most severe exigencies, and having already foresworn possession or use of chemical and biological weapons, the United States would have only conventional weapons with which to respond to such attacks. Because the single data point on the subject—the restraint of Saddam Hussein in not using chemical weapons in DESERT STORM—suggests the value of nuclear weapons in deterring attacks by weapons of mass destruction, to relinquish all weapons of mass destruction would be to declare “open season” for their use against the U.S. military.¹⁰

In the fourth place, the argument of “The Dilemma” stands both the evidence and the logic of proliferation on its head. The claim is that “if the two nuclear superpowers continue to need tens of thousands of nuclear warheads, other nations of the world will say they need them as well.” There is, however, no evidence to support such an assertion. When the Israeli Air Force attacked Iraq’s Osirak reactor in 1981, it was not because Iraq was attempting to obtain nuclear weapons to match those of the superpowers. Nuclear proliferation to India, Pakistan, South Africa, and presumably to Israel cannot be attributed to that cause either.

What the evidence shows instead is that “other nations” argue vigorously not for large nuclear arsenals of their own but for the nuclear states to effect reductions in *their* stockpiles. Article VI of the Nuclear Non-Proliferation Treaty entreats all states to “pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to pursue nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.” In compliance with this obligation, the United States reduced its inventory of nuclear weapons by more than half during the 1990s.

If a potential acquirer of nuclear weapons scans the strategic horizon and sees super-states, with arsenals of nuclear weapons numbering in the thousands, offering security assurances to those who refrain from acquiring weapons of mass destruction, the aspirant may well be discouraged from developing or obtaining its own weapons. If, on

*It might be true that “I Exist, Therefore I De-
ter”; but it might not. The risks are of the
greatest magnitude.*

the other hand, the numbers involved are in the hundreds, the ante to join the nuclear club is low, and even parity is achiev-

able. If, moreover, the means of retaliation are locked up in escrow rather than immediately available, an adversary might look very differently on the value of acquiring nuclear weapons. In such an instance an opportunity—and therefore the temptation—to change the strategic balance decisively would have been created where none existed before. Thus, logic would indicate that rather than dampen proliferation, the proposed reductions in nuclear arsenals to very low levels would *stimulate* proliferation. Indeed, low levels of warheads could trigger clandestine programs and cheating, because of both the ease in attaining competitive numbers and the anticipated leverage that would be attained. Unlike legitimate weapons held openly in escrow, illegitimate covert weapons would be usable.

Moreover, since escrow deliberately retards retaliation, an aggressor might reason that either the condominium would significantly delay, if not prevent, the removal of weapons from escrow, or indeed, that retaliation could be forestalled altogether. If Russia and China had all their weapons in escrow, for example, would they consent to allow the United States to remove some or all of its weapons for use? Could they be certain that the United States was not scheming to coerce *them* with the now-usable weapons? Would they not insist on removing their own weapons also, thereby precipitating a most deadly crisis? Even if consent were forthcoming, an adversary might believe that the time it would take the United States to bring the weapons to usable condition might offer time for negotiation—that it could negotiate something less than a nuclear retaliatory response. Given these considerations and the absence of extended deterrence noted earlier, proliferation would look a lot more attractive than it does currently, or would even under any official approach toward the ultimate size and disposition of the U.S. nuclear arsenal.

Fifth and finally, “The Dilemma,” like many arms control proposals, is focused sharply on nuclear weapons. It laments the facts that nuclear weapons are so powerful and that there are so many of them in the world. Acknowledging that impressive strides have been taken to reduce nuclear arsenals, “The Dilemma”

nevertheless conveys impatience at the tempo of reductions and offers a scheme to render them more safe while reducing their numbers dramatically.

It emphasizes—and demonizes—the *weapons*. It renders nuclear yields, for example, in terms not of kilotons, which is the convention, but of pounds of TNT equivalent. The twelve-kiloton Hiroshima bomb is presented as having yielded twenty-five million pounds of TNT equivalent. A similar rhetorical device is used to make numbers of weapons appear shocking. The figure of 32,500 “nuclear warheads” in the year 1969 is juxtaposed against “less than two hundred cities with populations of more than a hundred thousand in the Soviet Union.” But clearly the majority of those warheads were not designed for use against Soviet cities, nor could they have been so employed—atomic mines, antisubmarine and anti-air weapons, and artillery shells come to mind.

Ultimately, however, as Colin Gray reminds us, it is not weapons but who owns them that matters: “Clear military advantage on the side of order is a force for peace. . . . For an extreme example, an Iraqi ICBM [intercontinental ballistic missile] force would not be the same as the U.S. ICBM force, no matter how similar the two forces might be in their technical characteristics and standard practices of operation.”¹¹ To which point George Will adds: “Arms control as its believers envision it—agreements making the world safer by limiting technology—rests on the notion that the threat to peace is technological, not political, that the threat is the nature of particular weapons, not of particular regimes.”¹² Winston Churchill appreciated the point also; he “unhesitatingly endorsed the Western monopoly of the atomic bomb, emphasizing his opposition to entrusting U.S. and British knowledge of its secrets to the UN. ‘It would be criminal madness to cast it adrift in this still agitated and un-united world,’ he warned. No country had slept less well because the secrets of the bomb were held in American hands, but this would not have been the case had ‘some Communist or neo-Fascist state monopolised for the time being these dread agencies.’”¹³

The focus on nuclear weapons, the *means*, devalues the more important questions: the objectives for which conflict is waged—the *ends*; and how conflicts are conducted—the *ways*. Nuclear weapons are not the enemy. By making them the enemy, the United States weakens itself vis-à-vis its real and prospective adversaries.

Ultimately, then, “The Dilemma” counsels an approach based on weakness, not strength. Responsible U.S. leaders have been very consistent on the point. President John F. Kennedy warned in his 1961 inaugural address, “We dare not tempt them with weakness. For only when our arms are sufficient beyond doubt can we be certain beyond doubt that they will never be employed.”¹⁴ His caution was echoed forty years later in the remarks of Secretary of Defense Donald Rumsfeld at his initial news briefing: “A strong military does not guarantee peace and stability in the world, but we know that the opposite is true—that weakness is

provocative, that it does invite and entice people into doing things they would otherwise avoid, and our task is to see that we fashion deterrence to fit in this new national security environment.”¹⁵ In sharp contrast, “The Dilemma” asks that the United States: forgo its strategy of deterrence based on the expectation of prompt, severe retaliation; abandon its policy of extended deterrence; and instead accept high risks, even in effect tempting the use of weapons of mass destruction against its military, or even its homeland.

Still, despite the weakness and risk that must be assumed in moving toward a nuclear posture advocated in “The Dilemma,” one can agree that the detonation of a single nuclear warhead on American soil would be a catastrophe of the

One could argue today that with respect to nuclear weapons and nuclear strategy American leaders got it right, or mostly right.

greatest magnitude. For a variety of reasons, that is a possibility today, and its probability is increasing with the passage of time. Even with large, ready nuclear forces,

deterrence can fail. It would be the height of irresponsibility to believe, and to act on the belief, that deterrence cannot fail.

The detonation of a single nuclear warhead on U.S. soil would constitute an event from which the United States might never recover. The loss of confidence by the citizenry in the ability of the U.S. Department of *Defense* to protect them would be incalculable. The bond of trust that, at the most elementary level, the people will be kept secure would be sundered. What subsequent action could redress such a betrayal? A retaliatory attack that murdered thousands of innocents in the country of the aggressor might be delivered, to deter additional attacks from the original perpetrator or others watching the drama unfold. Even that, however, would be both unsatisfying and of highly questionable morality.

If the detonation of a single weapon on American territory, then, is truly unacceptable, the appropriate strategic response is not to shrink the U.S. nuclear arsenal and place it in unusable escrow. A better risk-reducing solution is to construct defenses against nuclear attack.

Today, arms control is preventing the United States both from reducing its strategic nuclear arsenal to levels that it would prefer (the START process) and from obtaining effective defenses (the ABM Treaty). In each instance, arms control gives Russia a veto on decisions of greatest import to U.S. security. An approach preferable to that presented in “The Dilemma” might be to withdraw from the START II Treaty and the ABM Treaty—bilateral treaties with the Soviet Union, a country that no longer exists. This could be done *without abrogating either treaty*; withdrawal is provided for in both instruments, and to take advantage of those clauses is to abide by the treaties’ provisions. In any case, arms control exists to control adversarial competition in weaponry. Russia and the United

States today are not adversaries. President George W. Bush put it straightforwardly in 2000, as a candidate: “Russia itself is no longer our enemy. The cold war logic that led to the creation of massive stockpiles on both sides is now outdated. Our mutual security need no longer depend on a nuclear balance of terror.”¹⁶ Therefore, arms control between the two countries is unnecessary and irrelevant. Each should be free to pursue its own strategic agenda.

The United States does not owe Russia, China, or any other country an unopposed opportunity to kill its citizens. Arguments claiming that missile defenses “threaten” the deterrents of other states must be rebutted in plain language: such defenses threaten only the ability of others to kill U.S. citizens in large numbers by means of ballistic missile attack. An argument that missile defenses threaten the deterrent capabilities of other states must be accompanied by some sense of what actions by the United States those deterrents are seeking to forestall. In other words, why does China or Russia require the unchallenged ability to exterminate American citizens in their homes? Why should the United States specifically grant such a capability? As Henry Kissinger has argued, “Deliberate vulnerability, when technology is available to avoid it, cannot be a strategic objective, cannot be a political objective, and cannot be a moral objective of any American president.”¹⁷

A perfect “Astrodome” defense—an impermeable “roof”—is unnecessary. It is at the same time the wrong policy objective and the straw-man target of critics. Instead, by significantly complicating the strategic calculus, defenses offer important benefits *regardless of how well they might actually perform*. This is true because any adversary contemplating attacking in the face of missile defenses is obliged to believe they will work, and work well. The credibility of American defenses would be underwritten by the military and technological power of the United States. What prospective attacker would consider a defensive system built by the United States and confidently tell itself, “The U.S. defense is junk, our warheads will penetrate it”?

The U.S. strategic approach should be to reduce its inventory of strategic offensive weapons to levels that would ensure a strong, secure strategic reserve against any prospective threat, and to construct a national missile defense on a priority basis. The missile defense would seek to limit damage in the event of the failure of deterrence and to protect the United States actively against nuclear blackmail, as well as against accidental or unauthorized attack. President Bush addressed both sides of the equation in a speech on 1 May 2001: “We need a new framework that allows us to build missile defenses to counter the different threats of today’s world. . . . I am committed to achieving a credible deterrent with the lowest-possible number of nuclear weapons consistent with our national security needs.”¹⁸

In summary, rather than take the high-risk course that leads to extremely deep reductions and nuclear escrow, the United States would be far better off to maintain a secure, capable strategic reserve and construct missile defenses to protect its people. The nation needs a “shield of dreams,” as Senator Joseph Biden has derisively called it.¹⁹ With a defense in place against ballistic missile attack, no challenger would be tempted to attack. Shield of dreams? That’s right: “Build it and they *won’t* come.”

NOTES

1. See McGeorge Bundy, “The Bishops and the Bomb,” *New York Review of Books*, 16 June 1983.
2. Lawrence Freedman, “I Exist, Therefore I Deter,” *International Security*, Summer 1988, pp. 184–5.
3. Edward Mead Earle, “Lenin, Trotsky, Stalin: Soviet Concepts of War,” in *Makers of Modern Strategy*, ed. Edward Mead Earle (Princeton, N.J.: Princeton Univ. Press, 1943), p. 327.
4. Waleed Najeeb and Tom Seery, “U.S. Wrong on Iraqi Sanctions,” *Milwaukee Journal Sentinel*, 10 September 2000, available on the World Wide Web: *Early Bird*, <http://ebird.dtic.mil>.
5. Muammar Qadhafi, speech to students of the Higher Institute for Applied Social Studies at the Great al-Fatih University, 18 April 2000, trans. *FBIS Daily Reports: Near East and South Asia* (FBIS-NES-90-078), 23 April 1990, p. 8.
6. “Rubber ruler” recalls that the prescribed fractions of population and industry varied over time. In 1965, mutual assured destruction was said to require the capability to destroy a quarter to a third of the population, plus two-thirds of the industry of the Soviet Union, after riding out a Soviet first strike (U.S. Dept. of Defense, *Report of the Secretary of Defense on the FY66–70 Defense Program* [Washington, D.C.: Govt. Print. Off., 1965]). In 1967 the requirement changed to from a fifth to a quarter of the USSR’s population plus one-half to two-thirds of its industry (U.S. Dept. of Defense, *Report of the Secretary of Defense on the FY68–72 Defense Program* [Washington, D.C.: Govt. Print. Off., 1967]). Then, in 1968, it was adjusted downward to from one-fifth to one-quarter of the Soviet population plus half of the nation’s industry (U.S. Dept. of Defense, *Report of the Secretary of Defense on the FY69–73 Defense Program* [Washington, D.C.: Govt. Print. Off., 1968]). The declining fractions reflected an appreciation of the increases in the quantity, accuracy, and yield of Soviet weapons, reducing the number of U.S. weapons that would survive a first strike and thus be available for retaliation.
7. *Thinking about Nuclear Weapons* (London: Royal United Services Institute for Defence Studies, 1997), p. 15.
8. *Ibid.*, p. 54.
9. As Robert Jervis has written, “Many analysts believe . . . that allies cannot be sheltered under the nuclear umbrella and that ‘extended deterrence’ is a fiction. As I have argued elsewhere, however, both logic and the historical record indicate that this position is not true.” See his “The Future of World Politics: Will It Resemble the Past?” *International Security*, Winter 1991–92, p. 48.
10. Regarding Iraqi restraint, “In a variety of ways, including a direct meeting with Tariq Aziz, the Iraqi foreign minister, the American secretary of state, James A. Baker, warned Saddam Hussein that the use of chemical or biological weapons against allied forces would be met by ‘the most severe consequences.’ The Iraqis did not use these weapons and later said they understood the American warning to mean a nuclear response.” Michael Oreskes, “Troubling the Waters of Nuclear Deterrence,” *New York Times*, 4 June 2000, p. IV-3. Keith B. Payne put it this way: “The evidence that nuclear deterrence was necessary to deter the Iraqi use of chemical weapons during the Gulf War is not trivial. . . . Tariq Aziz has stated that

- Iraq was deterred from using its weapons of mass destruction during the war because Saddam Hussein interpreted Washington's various threats of grievous retaliation as meaning *nuclear* retaliation." *The Case against Nuclear Abolition and for Nuclear Deterrence* (Fairfax, Va.: National Institute for Public Policy, December 1997), p. 30.
11. Colin S. Gray, *House of Cards: Why Arms Control Must Fail* (Ithaca, N.Y.: Cornell Univ. Press, 1992). See also his *Weapons Don't Make War: Policy, Strategy, and Military Technology* (Lawrence: Univ. Press of Kansas, 1993).
 12. George Will, "The Arms Control Fetish," *Washington Post*, 21 September 1995, p. 31.
 13. Quoted in Spencer Warren, "Churchill's Realism: Reflections on the Fulton Speech," *National Interest*, Winter 1995/96, p. 48. Cf.: "There is no real security in being just as strong as a potential enemy; there is security only in being a little stronger. There is no possibility of action if one's strength is fully checked; there is a chance for a positive foreign policy only if there is a margin of force which can be freely used." Nicholas J. Spykman, *America's Strategy in World Politics: The United States and the Balance of Power* (1942; repr. Hamden, Conn.: Archon, 1970), p. 21.
 14. Reprinted in U.S. Dept. of State, *Bulletin*, 6 February 1961, pp. 175–6.
 15. U.S. Dept. of Defense, transcript of news briefing, Secretary of Defense Donald H. Rumsfeld, 26 January 2001 (available electronically from the Defense Technical Information Service: dltranscripts_sender@dtic.mil).
 16. "Excerpts from Bush's Remarks on National Security and Arms Policy," *New York Times*, 24 May 2000, available on the World Wide Web: *Early Bird*, <http://ebird.dtic.mil>.
 17. Henry Kissinger, quoted in "Bush's Breakthrough," *Wall Street Journal*, 25 May 2000, available on the World Wide Web: *Early Bird*, <http://ebird.dtic.mil>.
 18. "Remarks by the President to Students and Faculty at National Defense University, 1 May 2001," retrieved from the World Wide Web: <http://www.whitehouse.gov/news/releases/2001/05/text/20010501-10.html>.
 19. Quoted in Robin Wright, "Powell Puts U.S. on Pedestal, Observers Say," *Los Angeles Times*, 28 January 2001, p. 4. The allusion is to the 1989 Universal movie *Field of Dreams*, in which the main character is mysteriously urged by a disembodied voice to construct a baseball field on his property: "If you build it, they will come."

THINKING ABOUT THE UNTHINKABLE

Unreasonable Exuberance?

Andrew L. Ross

The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.

GEORGE BERNARD SHAW

Thinking about the unthinkable just ain't what it used to be. Such is the Cold Warrior's lament (that, and not having the Soviet Union to kick around anymore—after all, Russia, China, Iraq, Iran, and today's other assorted “states of concern” are poor replacements for the old bad bear). The Strategic Arms Reductions Talks (START) process is slowly but thus far surely shrinking the U.S. nuclear arsenal. Nuclear-capable bombers have been taken off day-to-day alert. Land-based and submarine-based intercontinental ballistic missiles have been “detargeted.” Nuclear modernization has been abandoned in favor of “stockpile stewardship.” Throw-weight (payload) and circular-error-probable (accuracy) calculations, and nuclear net assessments more generally, have virtually fallen by the wayside. Nuclear duty assignments, which the armed forces

once restricted to active-duty personnel, have been opened to members of the reserves and the National Guard. Now a retired four-star admiral, writing not in the pages of the *Bulletin of the Atomic Scientists* but in the *Naval War College Review*, proposes that the United States needs neither the 3,000–3,500 nuclear warheads allowed under START II nor even the 2,000–2,500 warheads envisioned under a prospective START III, but only two hundred. There is more: those two hundred warheads, along with the two hundred nuclear warheads retained by each of the other seven members of a nuclear “condominium,”

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would be placed in “strategic escrow,” subject to international monitoring and verification. Implementation of the escrow scheme would, as intended, amount to the near abolition of nuclear weapons—to the further dismay, no doubt, of the ghost of General Curtis LeMay, who led the Strategic Air Command in its glory days.

For Herman Kahn and other classical purveyors of nuclear theology, “thinking about the unthinkable” meant thinking about nuclear war.¹ Given the catastrophic consequences of nuclear war, how could they have avoided thinking about it? Not to think clearly, rigorously, and systematically about how to deter—and, if necessary, to fight and win—a nuclear war would have been irresponsible. Nuclear weapons and the prospect of their use, however remote, demanded the attention of defense planners.

Today, ironically, advocates of deep nuclear cuts and even nuclear disarmament can also lay claim to Kahn’s infamous phrase. Thinking about dramatically reducing or eliminating nuclear weapons constitutes thinking about the unthinkable no less certainly than does thinking about fighting and winning nuclear wars—and it is no less bold. Given the potentially catastrophic consequences of nuclear war, how can we not think about slashing the world’s nuclear arsenals and perhaps even eventually eliminating them? Not to think clearly, rigorously, and systematically about whether to reduce and even eradicate nuclear weapons would be irresponsible. Serious nuclear arms control (that is, well beyond START I, II, and III) and nuclear disarmament, however remote their prospects, now demand the attention of defense planners.

Here and elsewhere, Admiral Stansfield Turner has sided with those who have challenged the conventional, and original, meaning of “the unthinkable.”² Indeed, by endorsing nuclear disarmament as a “desirable goal,” he joins a small number of prominent retired officers—most notably General Lee Butler (the first commander in chief of the U.S. Strategic Command), General John R. Galvin, General Charles A. Horner, and General Andrew J. Goodpaster—who have “come out of the closet” to reveal themselves as nuclear abolitionists.³

The admiral’s essay will be greeted coolly by those who have not yet revisited the meaning of thinking about the unthinkable. His proposal to slash the U.S. nuclear arsenal to two hundred warheads and place them, along with the warheads of the other nuclear powers, in strategic escrow until nuclear abolition is practical will encounter serious resistance—when it is not simply dismissed or ignored. The nuclear force–structure implications of the admiral’s implicit assertion that usable strategic forces are composed of conventional rather than nuclear weapons are sure to be contested by the nuclear priesthood. Too few defense planners share the admiral’s quite explicit concern about the dangers inherent in the “conventionalization” of nuclear weapons—the notion that they

can be used in war as if they were merely more effective conventional weapons. Even fewer will applaud him for taking the Senate to task for failing to ratify the Comprehensive Test Ban Treaty or for his championing of an Anti-Ballistic Missile (ABM) Treaty under assault by misguided advocates of national missile defense. “Radical” is one of the more polite terms that will be used to characterize Admiral Turner’s proposal.

The admiral’s proposed course of action raises questions and poses certain risks. It would not be difficult to deconstruct his proposal, contest and parse its

The centrality of atomic fission and fusion is giving way to the collection, processing, fusion, and dissemination of information. Moore’s Law and Metcalfe’s Law rule.

assumptions, and dwell at length on its difficulties and risks. Why, for instance, has he settled upon two hundred warheads? Why not one hundred, or five hundred? Will the Russian response to a

unilateral American drawdown indeed be governed by reciprocity? How would the other nuclear states be persuaded to deposit their warheads in an internationally monitored strategic escrow and establish a condominium of nuclear powers? Will the rest of the world have confidence in international monitoring of that nuclear escrow of the UN Security Council’s five permanent members? Can we expect nonnuclear powers to welcome a nuclear condominium? Would such a condominium serve only to institutionalize further the divide between nuclear haves and have-nots? How will its members hedge against a breakdown of the envisioned regime? Might seemingly prudent hedges in fact contribute to the regime’s breakdown? How will the conflicting principles underlying a realist major-power condominium and a liberal international nuclear-monitoring regime be reconciled? Are there other, perhaps more practical, alternatives for achieving the admiral’s objectives?

Such questions deserve more attention. Details—about the dynamics of a reciprocal nuclear drawdown; the standard operating procedures for a strategic escrow; the establishment, maintenance, and management of an eight-power nuclear condominium—matter. Yet the details of the process Admiral Turner seeks to set in motion should not be allowed to obscure the grand purpose of the process and its significance. He is on the right track. The stockpiles of nuclear weapons accumulated during the second half of the twentieth century, particularly by the United States and the former Soviet Union, should be dramatically reduced, though not yet eliminated. The strategic value of nuclear weapons and their impact on international security affairs should be minimized. The call for nuclear marginalization should be heeded.⁴

DEEP REDUCTIONS

For the United States, the costs and risks of dismantling the bulk of its nuclear arsenal are minimal. The significance of nuclear weapons for the United States today should not be exaggerated. When the rest of the world looks to the United States for leadership, it does so because of the full panoply of resources the country can bring to bear and its continuing commitment to an open, liberal world order—not because of any specific regard for its nuclear prowess. Nuclear weapons are the linchpin neither of the U.S. position in the world nor of its security. America's preeminence, its status as a “full-service” superpower with global diplomatic, economic, and military reach, is not dependent on the size of its nuclear arsenal. The foundation of U.S. preeminence is a wide array of tangible and intangible (“hard” and “soft”) power resources:⁵ the world's benchmark economy—a strong, dynamic engine that outperforms all others and to which all seek access; incomparable scientific and technological capabilities; a system of higher education that is the envy of the world; a growing information, and knowledge, edge;⁶ the fundamental soundness of America's ideas, values, political and economic liberalism, and culture—and their nearly universal appeal, making them the standard against which all others are judged; and finally, but not least, an overwhelming conventional military superiority. Unilaterally reducing the nuclear arsenal of the United States to a thousand warheads and pursuing limited further reciprocal reductions would do little, if anything, to diminish the nation's preponderance. Further, it would enhance the credibility of the U.S. nonproliferation posture.⁷

During the Cold War, nuclear weapons were accorded a central role in U.S. strategy. In those years they were thought to provide an effective counter to not only the nuclear capabilities of a rival superpower but the apparent quantitative conventional superiority of that rival and its allies. The perceived asymmetrical deterrent and warfighting value of nuclear weapons contributed significantly to the nuclear buildup rued by Admiral Turner. Notably, extended deterrence, though not necessarily fundamental deterrence, relied on the idea that the United States might use nuclear weapons first—even against conventional aggression. The intended message was: These are weapons, like any other, to be used.

Less is expected of nuclear weapons today. Their role is far less central, if not yet peripheral. The appropriately residual role for nuclear weapons in U.S. strategy is deterrence of nuclear use.⁸ That is not a terribly demanding task; it requires primarily that the United States retain a nuclear retaliatory capability that is secure, credible, and essentially countervalue (i.e., aimed at social and economic targets—especially cities—rather than military forces). Such a capability need not be as large as it is today. The balance of terror, to the extent it still exists,

is not terribly delicate. Whatever the historical merits of the warfighting capabilities sought by the nuclear-utility theorists (NUTs) responsible for the

The details of the process Admiral Turner seeks to set in motion should not be allowed to obscure the grand purpose and its significance. He is on the right track.

conventionalization of nuclear weapons rightly denounced by Admiral Turner, there is little requirement for such capabilities today. The minimal requirements postulated by an assured-destruction

posture can be easily met by a thousand-warhead force.⁹ There is nothing that can be deterred with START III's proposed 2,000–2,500 warheads that cannot be deterred with one thousand.

As long as nuclear weapons remain in the U.S. inventory, their existential contribution to the deterrence of conventional and biological or chemical warfare challenges cannot be ruled out. But there is no longer reason to raise explicitly the specter of a nuclear response to conventional aggression. Whatever the deterrent merits of the threat of nuclear escalation in the past, the conventional challenges existing today do not warrant a nuclear response—and only inexcusable complacency by the United States would necessitate one in the future.

Similarly, despite the alleged advantages of a posture of calculated strategic ambiguity, the threat of overwhelming conventional retaliation should prove an effective deterrent to the use of biological and chemical weapons. Deterring attacks by these two kinds of weapons of mass destruction does not necessitate threats to retaliate with the only kind the United States has not foresworn. Explicitly leaving the door open for a nuclear response to the use of biological or chemical weapons places a higher value than necessary on nuclear weapons. That is the wrong message to convey to nuclear aspirants and others around the world.

Instead, limitations on the strategic and military utility of nuclear weapons should be emphasized.¹⁰ After all, the flexible strategic power that can actually be employed to advance and protect American interests resides less in the nation's nuclear arsenal than in its overwhelming conventional military superiority. The impressive U.S. reconnaissance-strike complex—primarily C4ISR*, precision guided munitions, and defense-suppression systems—on display during DESERT STORM and ALLIED FORCE is no less strategic, and demonstrably more usable, than the U.S. nuclear arsenal.¹¹ Continuing improvements in the precision and lethality of conventional systems promise to erode further the nuclear stranglehold on things “strategic.” The force-structure implications of this

* Command, control, communications, computers, intelligence, surveillance, and reconnaissance.

transformation were recently captured in the title of an insightful article by Andrew F. Krepinevich and Steven Kosiak: “Smarter Bombs, Fewer Nukes.”¹²

NUCLEAR-FREE VISIONS

In an implicit affirmation of the limited utility of nuclear weapons, joint and service visions of what is commonly referred to as, variously, the “military after next” and the “revolution (or less radically, transformation) in military affairs” are strikingly nuclear-free.¹³ For the Joint Chiefs of Staff, in their *Joint Vision 2020*, the key to the “full-spectrum dominance” that is to be provided by “dominant maneuver,” “precision engagement,” “focused logistics,” and “full-dimensional protection” is information, not nuclear, superiority.¹⁴ The technologies upon which the transformation foreseen by U.S. Army statements and concepts like *Army Vision 2010*, “Force XXI,” and the “Army after Next” depend include the likes of global cellular communications, smart pagers, manned and unmanned sensors, digitization, artificial intelligence, data compression, stealth, “bril-

The conventional challenges existing today do not warrant a nuclear response—and only inexcusable complacency by the United States would necessitate one in the future.

liant” munitions, ceramics and other advanced materials, micro- and nanoelectronics, electromagnetic firing systems, robotics, and directed energy—virtually everything and anything but nuclear

technology. Similarly, the twenty-first-century aerospace force posited by the U.S. Air Force’s Scientific Advisory Board would be built upon breakthroughs in unmanned combat and reconnaissance aerial vehicles (UCAVs and UAVs); high-power, short-wavelength lasers; active and infrared stealth; distributed satellite constellations; automated, reusable space launch vehicles; human-machine interactions; high-power radio-frequency-attack cruise missiles; and information munitions.¹⁵

Figuring prominently in the Navy’s vision of network-centric warfare (NCW) is an expeditionary grid of networked space, air, sea (surface and subsurface), and ground sensors, weapons, and platforms. This network is to be populated by the likes of “micro” and “nano” sensors; unmanned aerial and underwater vehicles (UAVs and UUVs) and UCAVs; and modular surface and subsurface vessels with, perhaps, virtual command posts. There are to be smart ships, all-electric ships, and fast ships. “Nuclear” appears to be absent from the NCW lexicon.¹⁶

Similarly, the nine broad technology areas identified by the National Research Council’s Naval Studies Board as forming the naval technology base for the period 2000 to 2035—computation, information and communications, sensors, automation, human performance, materials, power and propulsion,

environments, and enterprise processes—are nuclear-free. The board’s list of “exciting new technologies” also omits nuclear technology. Its examination of weapons requirements includes nuclear weapons, but it explores alternatives to nuclear weapons as well.¹⁷

Neither joint nor specifically Army, Air Force, or Navy visions feature nuclear capabilities. Instead, it is C4ISR that is technologically critical to military transformation, and at the heart of C4ISR lie information and communications technologies, both hardware and software. For military visionaries, nuclear technology is no longer where the action is. The technological future lies in digitization, intelligent software, and rapid data fusion and display; information architecture, networks, networks of networks, and systems of systems; bandwidth, and computational processing power and speed; sensors; information and cyber operations; distributed, or virtual, command posts; and self-synchronization and autonomic systems. Keeping the U.S. military edge requires little exertion on the nuclear front.¹⁸ The nuclear age, it would seem, is being superseded by the information age (and perhaps also the “nuclear umbrella” by an “information umbrella”). The centrality of atomic fission and fusion is giving way to the collection, processing, fusion, and dissemination of information. Moore’s Law and Metcalfe’s Law rule.¹⁹

AN UNREASONABLE EXUBERANCE FOR NEAR ABOLITION?

Of course, exuberant military visionaries and proponents of a revolution, or transformation, in military affairs recognize that nuclear technology will always be with us. It is, after all, now over fifty years old. They have (intentionally or not) demoted nuclear technology, taken it off its pedestal, but they have not abolished it. Nuclear abolition may well be, despite its allure, not only impractical but undesirable. Dropping to two hundred warheads by 2006, as proposed by sober critics like Admiral Turner (in his table 2), is problematical as well. Halving the force envisioned under a START III to a thousand warheads, even unilaterally, as a prelude to additional limited and reciprocal reductions, is not.²⁰

Relative numbers of nuclear warheads are indeed of little consequence at the levels attained by the United States and the Soviet Union during the Cold War and maintained by the United States and Russia since. The smaller the arsenals, however, the more that numbers of warheads are likely to matter. At a thousand warheads apiece, the United States and Russia would still be essentially immune to “breakout”—deployment of additional weapons—by the other. Nuclear breakout could be significant politically, but not militarily. Further, the United States could be confident of retaining a credible deterrent even if it reduced its arsenal to a thousand before Russia dropped to that level.

Immunity to breakout would seriously deteriorate at levels substantially below a thousand. Abolition would make the world not only a bit too safe for

Implementation of the escrow scheme would, as intended, amount to the near abolition of nuclear weapons—to the further dismay, no doubt, of the ghost of General Curtis LeMay.

conventional war but highly vulnerable and sensitive to the covert deployment of nuclear weapons. At zero, nuclear breakout would be enormously consequential, not only politically but militarily. The

perpetrator would gain an absolute, and usable, military advantage. Given the potential payoff and the likely uncertainties about the intentions and behavior of others, the temptation to break out and build even a small nuclear arsenal would be difficult to resist. This security dilemma would be operative as well at the way station of two hundred warheads, even assuming strategic escrow. At two hundred weapons, unlike the situation at a thousand, absolute advantage would be within reach—or, perhaps more importantly, perceived as being within reach.²¹

Reduction to two hundred warheads would have the additional disadvantage of lowering the bar for other actual and potential nuclear states. It is not entirely clear why the United States, or Russia for that matter, should accept parity with China, Britain, France, Israel, India, and Pakistan. Also, the potential of achieving parity with the current members of the nuclear club may only further whet the appetites of nuclear aspirants around the world. The contribution that deep cuts in existing nuclear arsenals would make to the cause of nonproliferation should be exploited, but the restraining influence of abolition or near abolition on nuclear ambitions should not be exaggerated.

UNTHINKABLE AND UNREASONABLE?

The contemporary version of the unthinkable—nuclear abolition or near abolition—should be contemplated no less warily than the original. Deep cuts are indeed warranted; an American nuclear arsenal of a thousand warheads would yield the most important advantages of a two-hundred-warhead force without its disturbing disadvantages. But deep cuts are not enough. They should be accompanied by a serious arms control agenda in Washington that: reverses the Senate's misguided rejection of the Comprehensive Test Ban Treaty; unambiguously supports the Nuclear Nonproliferation Treaty; calls for continued cooperation to prevent the accidental use of nuclear weapons and to ensure, through such vehicles as the Cooperative Threat Reduction Program, the safety of Russian nuclear weapons and fissile materials; formalizes moratoria on the production of fissile materials; offers a no-first-use pledge—either an unqualified no-nuclear-first-use pledge or a no first use of weapons of mass destruction (WMD) pledge; maintains space as a sanctuary with respect not only to WMD,

as provided for by the Outer Space Treaty, but to all weapons; urges a broadening and deepening of the Missile Technology Control Regime; and declares that the United States will not unilaterally abrogate the ABM Treaty. This agenda would contribute to both Admiral Turner's objectives and the security component of an open, liberal international order.

The United States cannot seriously expect others to embrace restraint, nuclear or otherwise, if it fails to do so itself. Defense planners are necessarily attuned to the risks that may accompany restraint. Yet at times, to borrow a marketing slogan employed by a prominent insurance and financial services group, "The greatest risk is not taking one."²² Indeed, the risks of not implementing deep nuclear cuts and embracing calculated restraint are greater than the risks of doing so.

While the argument for deep nuclear cuts is compelling, defense planners will not rush to embrace Admiral Turner's nuclear-escrow scheme. They can still, however, benefit from the counsel of this most "unreasonable" and thoughtful of men. Such is the source of progress.

NOTES

1. Herman Kahn, *Thinking about the Unthinkable* (New York: Horizon Press, 1962).
2. Stansfield Turner, *Caging the Nuclear Genie: An American Challenge for Global Security* (Boulder, Colo.: Westview Press, 1997), and *Caging the Genies: A Workable Solution for Nuclear, Chemical, and Biological Weapons* (Boulder, Colo.: Westview Press, 1999).
3. See George Lee Butler, "Time to End the Age of Nukes," *Bulletin of the Atomic Scientists*, March–April 1997, pp. 33–6; "A Voice of Reason," *Bulletin of the Atomic Scientists*, May–June 1998, pp. 58–61; and "Zero Tolerance," *Bulletin of the Atomic Scientists*, January–February 2000, pp. 20–1 and 72–5. See also Henry L. Stimson Center, "Generals Speak Out on Eliminating Nuclear Weapons," *Eliminating Weapons of Mass Destruction*, retrieved from the World Wide Web: <http://www.stimson.org/zeronuke/generals/index.html>.
4. For an insightful discussion of nuclear marginalization, see William Walker, "Nuclear Order and Disorder," *International Affairs*, October 2000, pp. 703–24.
5. For a discussion of the dimensions of power and the changing relationship between hard and soft power, see Joseph S. Nye, Jr., *Bound to Lead: The Changing Nature of American Power* (New York: Basic Books, 1990).
6. Joseph S. Nye, Jr., and William A. Owens, "America's Information Edge," *Foreign Affairs*, March–April 1996, pp. 20–36.
7. That nonproliferation serves American interests cannot be seriously questioned. The hyperrealist notion that "more may be better," though an intriguing, even beguiling, intellectual construct, is not a sound basis for the U.S. stance on nuclear proliferation. See Kenneth N. Waltz, *The Spread of Nuclear Weapons: More May Be Better*, Adelphi Paper 171 (London: International Institute for Strategic Studies, 1981); Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W. W. Norton, 1995); and John J. Mearsheimer, "Back to the Future: Instability in Europe after the Cold War," *International Security*, Summer 1990, pp. 5–56. Encouraging, rather than discouraging, the acquisition of nuclear

- weapons by others, even selectively, is an experiment the nation should not want to run.
8. The military implications of nuclear technology were astutely discerned by Bernard Brodie at the dawn of the nuclear age: "Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other useful purpose." Bernard Brodie, "Implications for Military Policy," in *The Absolute Weapon: Atomic Power and World Order*, ed. Frederick S. Dunn, Bernard Brodie, Arnold Wolfers, Percy E. Corbett, and William T. R. Fox (New York: Harcourt, Brace, 1946), p. 76. A reappraisal of the issues addressed in *The Absolute Weapon* can be found in T. V. Paul, Richard J. Harknett, and James J. Wirtz, eds., *The Absolute Weapon Revisited: Nuclear Arms and the Emerging International Order* (Ann Arbor: Univ. of Michigan Press, 1998).
 9. The United States is still better off MAD (that is, adhering to "mutually assured destruction") than NUTs.
 10. As a former chairman of the Joint Chiefs of Staff, General John Shalikashvili, has noted, "Given our overwhelming conventional superiority, assigning a broader role to nuclear weapons would cause far more problems than it would solve." John M. Shalikashvili, "The Test Ban Solution," *Washington Post*, 6 January 2001, p. 21.
 11. On the elements of the reconnaissance-strike complex, see Ashton B. Carter, William J. Perry, and John D. Steinbruner, *A New Concept of Cooperative Security* (Washington, D.C.: Brookings Institution, 1992).
 12. Andrew F. Krepinevich, Jr., and Steven M. Kosiak, "Smarter Bombs, Fewer Nukes," *Bulletin of the Atomic Scientists*, November–December 1998, pp. 26–32. See also Andrew F. Krepinevich, Jr., "Forging a Path to a Post-Nuclear U.S. Military," *Issues in Science and Technology*, Spring 1997, pp. 79–84.
 13. The emphasis on other than nuclear technologies is evident as well in analytical treatments of the emerging revolution in military affairs. See, for instance, Eliot A. Cohen, "A Revolution in Warfare," *Foreign Affairs*, March–April 1996, pp. 37–54; Lawrence Freedman, *The Revolution in Strategic Affairs*, Adelphi Paper 318 (Oxford, U.K.: Oxford Univ. Press, 1998); Andrew F. Krepinevich, Jr., "Cavalry to Computer: The Pattern of Military Revolutions," *National Interest*, Fall 1994, pp. 30–42; and Michael O'Hanlon, *Technological Change and the Future of Warfare* (Washington, D.C.: Brookings Institution, 2000).
 14. U.S. Joint Staff, *Joint Vision 2020*, retrieved from the World Wide Web: <http://www.dtic.mil/jv2020/jvpub2.htm>.
 15. U.S. Air Force, *New World Vistas: Air and Space Power for the 21st Century* (Washington, D.C.: Scientific Advisory Board, December 1995).
 16. Discussions of network-centric warfare are remarkably nuclear-free. See David S. Alberts, John J. Garstka, and Frederick P. Stein, *Network Centric Warfare: Developing and Leveraging Information Superiority*, 2d rev. ed. (Washington, D.C.: C4ISR Cooperative Research Program, Department of Defense, 1999); Arthur K. Cebrowski [Vice Adm., USN] and John J. Garstka, "Network-Centric Warfare: Its Origin and Future," U.S. Naval Institute *Proceedings*, January 1998, pp. 28–35; and Committee on Network-Centric Naval Forces, Naval Studies Board, National Research Council, *Network-Centric Naval Forces: A Transition Strategy for Enhancing Operational Capabilities* (Washington, D.C.: National Academy Press, 2000).
 17. Panel on Technology, Committee on Technology for Future Naval Forces, Naval Studies Board, National Research Council, *Technology for the United States Navy and Marine Corps, 2000–2035: Becoming a 21st Century Force*, vol. 2, *Technology* (Washington, D.C.: National Academy Press, 1997), and vol. 5, *Weapons* (Washington, D.C.: National Academy Press, 1997).
 18. Note the lack of attention accorded U.S. nuclear capabilities in Ashton B. Carter and John P. White, eds., *Keeping the Edge: Managing Defense for the Future* (Cambridge, Mass., and Stanford, Calif.: Preventive Defense Project, 2000).
 19. Gordon Moore posited in 1965 that each successive generation of computer memory chip has twice the capacity of its predecessor and appears within two years of it, and that accordingly computing power rises exponentially; "What Is Moore's Law?" *Processor Hall of Fame*, retrieved from the World Wide

- Web: <http://www.intel.com/intel/museum/25anniv/hof/moore.htm>. Metcalfe's Law (named for Robert Metcalfe, founder of the 3Com Corporation and designer of the Ethernet protocol) states that the usefulness, or utility, of a network equals the square of the number of users; Charles Boyd, "Metcalfe's Law," *Management Issues*, retrieved from the World Wide Web: <http://www.mgt.smsu.edu/mgt487/mgtissue/newstrat/metcalfe.htm>. See also Alberts et al., *Network Centric Warfare*, app. A.
20. The choice is most assuredly not one, as Jonathan Schell, in "The Folly of Arms Control," *Foreign Affairs*, September–October 2000, pp. 22–46, would have us believe, of uncontrolled proliferation or nuclear abolition. There are always choices other than "all or nothing."
21. The precise thresholds above which immunity to breakout exists and below which it does not are, obviously, difficult to determine. But at a thousand warheads, we can be confident of breakout immunity; at two hundred we cannot.
22. AIG (the American International Group).

WAR GAMING IN THE INFORMATION AGE

Theory and Purpose

Paul Bracken and Martin Shubik

Over twenty years ago, a study was carried out under the sponsorship of the Defense Advanced Research Projects Agency and in collaboration with the General Accounting Office to survey and critique the models, simulations, and war games then in use by the Department of Defense.¹ From some points of view, twenty years ago means ancient history; changes in communication technology and computers since then can be measured

only in terms of orders of magnitudes. The new world of the networked battlefield, super-accurate weapons, and the information technology (IT) revolution, with its instant communication and seamless feedback, seems as far away from the mud of trench warfare in Flanders field as World War I was from the battle of Agincourt.

The present era in society, business, and warfare has been called “the information age,” and with good reason, given the extraordinary influence that the exponential advances in information technology and the increasing accuracy and lethality of weaponry have had on these institutions. But human beings and their biological data-processing, interpreting, and decision-making abilities have not changed at the rates of these impressive technologies. Indeed, they have not changed at all. Neither has the new technology changed the purposes of, or the principles behind, war gaming. It *has* added new problems, however, and it has made even more difficult the resolution of

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enduring problems that were critical twenty years ago. Notwithstanding the indisputable benefits of many forms of gaming, formal model building, and simulations, it appears that these sciences—as was the case with operations research, the behavioral sciences, and artificial intelligence (and now “complexity theory”)—were heavily oversold and their promise rashly overestimated in the 1960s and 1970s.

From their introduction by William McCarty Little in 1886, only manual war games were played at the Naval War College in Newport, Rhode Island, until 1958, when the Navy Electronic Warfare Simulator was built, heralding a new era in war gaming by tying it to the computer. Others were to develop this link to ever greater degrees. The expansion of new gaming centers at the Air War College, the Army’s Training and Doctrine Command, National Defense University, and at the Joint Forces Command (until October 1999 the U.S. Atlantic Command), along with the growth of for-profit consulting companies, helped to spread computer-based gaming and led to advances in war gaming and military operations research. These developments were not an unmixed blessing, however.

Along with the greater ability to handle complexity and administrative detail came a potential for loss of “transparency”—awareness by players of a game’s underlying assumptions—and a temptation to add “realistic features” to games, because it was so technologically easy to do so, without thinking much about whether the additions added to or detracted from the games’ underlying purposes. The push for added complexity rarely came from the people who thought games were a good way to test concepts or plans. Rather, it originated mainly from the technical community of analysts and gamers. There is now a divide between an increasingly specialized community of gamers and modelers on the one hand, and policy makers on the other; this divide is greater today than it was in the 1970s. Gamers have to market their capabilities the way any business does. There is nothing wrong with this, *per se*. But experience indicates that this marketing, and much of gaming’s development over the past twenty years, has been aimed at other gamers rather than the policy-making community. It has been aimed even less at casting light on new challenges to U.S. security management, challenges that barely existed twenty years ago.

Why has this happened? The reasons are, first, that with computer-driven games it becomes easy to hide layer upon layer of complexity behind user interfaces that few people understand; and second, that the impact on the policy process of program “modules” that are opaque to players is not considered. There is much to commend simplicity, in light of the inherent limitation of human data processing, especially when dealing with decision makers. With manual war games, it was not feasible to add “bells, whistles, and gongs”; careful thought was

required in designing every single move in the sparse abstraction that constituted a game.

Over the last twenty years, however, models, simulations, and games have merged with each other. The boundaries separating them are no longer clear, making overall assessment far more difficult. Modeling has become more complex, but thinking has not. The

The gold lies in human thought—assisted by modern communication and computers, not distracted by them.

very unreality of manual games made them real, in the sense that it forced attention to key questions. That is why simple board

games, like the *Kriegspiel*, were adopted by European general staffs in the nineteenth century. Playing them sharpened everyone's tactical and strategic sense. As Karl von Mueffling, the chief of the General Staff of the Prussian army, declared in 1824, at the very start of war gaming, "It's not a game at all, it's a training for war; I shall recommend it most emphatically to the whole army." Asked what games they like to play and what strategists they read, today's Chinese generals give an illuminating answer: they play Go and read Sun Tzu, because beneath their surface simplicity, the generals tell us, "there is great complexity."²

The advances in gaming since its inception have been large, whether we consider table games at the platoon level, tactical exercises, theater games, or political-military games up to the level of global war. But despite the greater complexity and technology, many old problems remain, and have even been magnified. The fascination with analytics and the attractiveness of trying to quantify phenomena we do not know how to describe accurately, let alone measure, suppresses many phenomena that may be of the essence in the darkness, turmoil, and confusion of real war. CNN pictures of "smart" missiles homing in on targets hardly convey the factors of morale, bravery, improvisation, trust, and the many others that weave a great armed force together.

As yet, computers do not provide wisdom. Seasoned, nonpartisan referees like Frank McHugh, military historians with the skills of a Harvey DeWeerd, and operational analysts of the quality of an Edward Paxon of RAND—all names that are likely unknown to the current war-gaming community—were once able to provide experiential depth that is still needed but is now harder to obtain than ever. A striking feature of the current gaming environment in contrast to that of two and three decades ago is the absence of generalists with an overview of both gaming technology and the decision-making process by which things actually get done. This is not just carping about the good old days: such generalist outlooks are now being applied to, and revolutionizing, a different field. Information technology is transforming business processes precisely because "e-business" has emphasized the *I* in IT—the *information*, not the technology. Managers who

understand corporate decision processes and market requirements have gotten their hands around corporate IT systems and wrestled them away from the technicians. The ongoing transformation of American business proves that this can be done and what it can achieve. A similar process in war gaming should begin.

THEORY AND WAR GAMING

The three decades after the great contributions of technology and analysis to winning World War II—contributions symbolized by the atom bomb, operations research, and cryptography—were heady, optimistic years for the application of computers to national defense. The driving idea was that a machine, the computer, would scale upward the analyses then being invented in the diverse fields of artificial intelligence, operations research, game theory, simulation, and formal organizational theory. The brave, new, modern world had dawned.

Whole new organizations were built, because the “old” ones did not get the message. Think tanks like the RAND Corporation and the Hudson Institute entered their golden ages. The first Monte Carlo (probabilistic) simulations made their appearance, and bigger and better digital models were immediately planned. The optimism was such that the Systems Development Corporation was spun off by RAND to perform simulations of unprecedented scale. The Office of Naval Research was “Lady Bountiful” to students of relevant theory. The Advanced Research Projects Agency supported consultants and researchers in management science and decision theory. The spirit of the times was that all problems would fall to analysis or simulation within the next decade.

The work of the mathematician John von Neumann on the representation of the anatomy of games by “game trees” and that of Claude Shannon on information theory provided for the first time a notation for, and understanding of, microstructure information flows, as well as a scientific method for investigating the basis of decision making. Herbert Simon predicted that the world chess championship would soon fall to a computer. The faculty at Carnegie Tech would provide business with *scientific* means for management. Robert McNamara was to do the same, first at the Ford Motor Company, then at the Department of Defense.

The progress made in those days, and afterward, was real and impressive, but the Cerebus paradox was soon encountered: every time a problem was solved, several more unsolved problems sprang up to replace it. The statement that various key problems in the decision sciences or in artificial intelligence would be solved “next year” turned out to involve, in effect, a DO LOOP where $NEXT = NEXT + 1$. A prediction in 1970 from Marvin Minsky, a pioneer in artificial intelligence, shows the point:

In from three to eight years, we will have a machine with the general intelligence of an average human being. I mean a machine that will be able to read Shakespeare, grease a car, play office politics, tell a joke, have a fight. At that point, the machine will begin to educate itself with fantastic speed. In a few months, it will be at genius level, and a few months after that, its power will be incalculable.³

Our perspective, nevertheless, is not pessimistic. On the contrary, the tools that prompted such predictions had given means to attack a vast array of basic and previously unapproachable problems. The early successes and the quantum

Notwithstanding their indisputable benefits, it appears that these sciences were heavily oversold and their promise rashly overestimated in the 1960s and 1970s.

leaps taken created a Camelot-like feeling of invincibility. A fundamental understanding of human behavior was presumed to be just around the corner. However, the early attempts to simulate check-

ers and chess, or to attach artificial arms and eyes to computers and tell them to pick up building blocks and put them on top of other ones, showed that far deeper and more subtle problems were involved than had been thought.

The same thing happened in war gaming and game theory. Far from solving all problems of human interactions, the knowledge yielded by game theory helped to demonstrate that simplistic concepts of optimal strategies and rational behavior were highly limited in application. In the new game models there was no morale; leadership had no meaning; passion and anger could not be portrayed. The simplification of the individual to a mechanistic decision maker stripped these away, and with it virtually all of the qualities that a good war college tries to instill.

Nuclear war games, for example, were built around grand optimization across the major commands responsible for these weapons, becoming giant linear-programming routines for building “optimal” nuclear strike plans. The very names of the models—such as the “Arsenal Exchange Model”—suggested mutual silo-emptyings, the launching of thousands of missiles to destroy the other side’s forces. Models were built of sufficient scale to manage such exchanges, but too much was left out that was important. The behavior of the isolated commanders with thousands of megatons under their control;⁴ the reaction of Nato allies to having World War III fought through the suburban sprawl of Europe; and whether the Polish army should be counted in the “Red” or “Blue” order of battle—all these issues were conveniently left out of models and games. These “gaps,” however, happened to be the points of greatest concern to decision makers.

Formal game-theoretic analysis has an important cautionary lesson to teach here. A simple analysis of any multistage game of even moderate complexity

(chess will do) shows us that even in so simple a case, human data-processing capacities and perceptions rule out unrestricted proliferation of information. The human being is a sophisticated but limited-capacity processor of information and can deal with voluminous input only if it is aggregated, or “chunked.” The human is a social animal, for whom “know who” counts as much as, if not more than, “know how.”

Another limitation concerns communication, the complexity of which is illustrated by an age-old military problem, the command and control of a multinational army—that is, an army composed of many national or ethnic parts. (This problem is becoming important once again, with coalition wars on the rise.) In 1918, officers of the Austro-Hungarian Empire barked orders first in German and then in four other languages in quick succession if they wished to convey to their troops what they had in mind.⁵ With differences in language come differences in cultural perceptions and in shared knowledge and customs, and considerable potential for misinterpretation. New technologies speed the transmission of symbols and facilitate computation, but they hardly influence the interpretation of meaning, the discernment of patterns, or the drawing of inferences from complex, noisy contextual data.

In terms of the future of war gaming, developments in theory bring the message that the major improvements are needed less in technology, in “newer toys for bigger boys,” than in persuasively written scenarios, assessments of why players did what they did, and postgame debriefings of what was actually learned. The gold lies in human thought—*assisted* by modern communication and computers, not distracted by them. An emerging appreciation of the complexity of human behavior has humbled the decision sciences, and it has simultaneously made them more useful, as their practitioners gain better and more realistic feelings for the scope and limits of their crafts.

ENDURING ISSUES

That there are new challenges in war gaming does not mean that all of the old challenges have been met. On the contrary, the long-standing problems of thinking through a game’s purpose and drawing lessons from it are handled no better today than thirty years ago. In some cases, this failing is made worse by the inappropriate application of new gaming technology and by failure to understand its proper uses.

One aspect of failure to think through fundamental purposes is an inability to make the basic distinction between the *explicit* game being played and the *implicit* one. The explicit game is the official event, the one presented in the briefing book and described in the orientation lecture that precedes game play. Should a new weapon system be upgraded? Will North Korea fire its weapons of

mass destruction? Illuminating such questions is an explicit purpose of war games. But very often, equally or even more important implicit games are being played at the same time. This is the game that cannot be mentioned in the official briefing, the one that asks questions that are too sensitive to pose explicitly but that savvy players recognize are the really important ones—fundamental issues of strategy and cost.

In the late 1930s, Joseph Stalin had his generals game the defense of the Soviet Union against German attack. Stalin ordered the conditions of defense precisely: massed troops on the border in a linear defense. The more perceptive Soviet generals knew that such a defense would mean disaster in the event of German

In the new game models there was no morale; leadership had no meaning; passion and anger could not be portrayed.

attack, an intuition that turned out to be correct. They also knew what defying Stalin by playing another strategy in the official game would mean. They played the lin-

ear defense in the official game, because they had no choice; however, they also held after-hours conversations about the consequences of following the official plan, and they staged informal, verbal games based on the official one but relaxing the political constraints. This is a common phenomenon known as “shadow gaming.”⁶ The most interesting questions are frequently not officially reflected in the game but are nonetheless implicitly understood and become part of the tacit knowledge that players take away. Yet there is almost no analytical attention given to the shadow game, even to its identification of issues.

Tacit knowledge often concerns what players thought they were doing and what players would have done if the game had taken another path. It is almost never mined for its full value. This is a problem that has been made worse by the nature of many decision-support systems (DSSs) used in games. In practice, most DSSs focus on explicit prospective choices without going back and retracing alternative courses of action. They overlook retrospective choices and the sensitivity of later decisions to earlier ones.

Most DSSs also stick with official rules past the point where this makes sense. Consider the target-identification problem. When a war goes badly, confusion increases, and objectives slip out of reach, the rules governing the identification of permissible targets begin to change. Fire discipline erodes. In a highly constrained war like the air campaign against Serbia, there are three things on the battlefield: friends, foes, and neutrals. But as the Vietnam War showed, once matters start to deteriorate, the boundaries between these distinct categories begin to blur, especially between neutrals and friends or foes. This is a very important issue, because that particular distinction not only forms the basis of much current strategy—victory with minimal collateral damage—but has led

militaries to acquire very expensive surveillance and targeting systems, and highly accurate weapons. The ways in which these systems could fail in circumstances in which victory seems attainable only with considerable collateral damage depend on different paths taken in a game. But these contingencies are almost never analyzed, and they are not captured by extant DSSs, whose rules stay fixed throughout a game.

In the corporate world of e-business, however, the distinction between explicit and tacit knowledge is central to knowledge management.⁷ Capturing and codifying tacit knowledge is a high priority in corporate America, because it is a major source of competitive advantage.⁸ Yet although they now use similar technologies (Groupware, Expert Systems, Neural Nets), war games achieve little payoff compared to what is taking place in business.

NEW CHALLENGES

If over the last twenty to thirty years both principles and purposes in gaming have remained the same, technology has of course changed, and so have many problems (in part because of the change in technology), problems that require new kinds of analysis in which gaming could be of great use. The greatest of these new challenges are: the revolution in military affairs; weapons of mass destruction; multipolarity, and the rise of Asian military power; the issue of the nation-state as the central actor in international affairs; information warfare; and international financial linkages and financial warfare.

Whether or not one accepts the argument that the United States is now at the beginning of a revolution in military affairs (RMA), it seems clear that technological enhancements in the form of precision strike weapons, information warfare, and systems of unparalleled interconnectedness mark a change in the nature of warfare, a change that is fundamental. It is important to assess the consequences of this change at several levels: strategic, operational, organizational, and technical.

The current art of war gaming is not up to the job. Partly this is because the problems are inherently difficult; but it is also because of an absence of professionals trained or willing to cross over into different intellectual fields. Broadly speaking, strategists and policy experts do little or no analysis whatever; they simply posit sweeping portraits of the future, basing them on the changing nature of war or the structure of the international system. On the other hand, technical people with specialized training in software and war gaming are seduced into emphasizing the use of these tools rather than focusing their attention on the real problems of a revolution in military affairs.

In practice, games that try to analyze an American RMA tend to leave out too much, such as the highly plausible response on the part of other countries of

simply accelerating their adoption of weapons of mass destruction. A case can be made that this is now taking place, without anyone acknowledging it. The high-profile use of high-tech U.S. forces against Iraq, Serbia, and others is

There is now a divide between gamers and modelers, on the one hand, and policy makers on the other; this divide is greater today than it was in the 1970s.

producing in many countries a sense that they cannot possibly compete on these terms; rather than giving up and accepting American power, they search for a “poor man’s RMA” in biological

and nuclear weapons. This is not to argue for a low-tech American approach. But it is striking that the “poor man’s” counter to high technology has not been seriously gamed, as to either its system-transforming effects or its operational ones. Fortunately, and notwithstanding the near misses of the Aum Shinri Kyo in Japan in 1995 and the Iraqi weapons programs in 1991, no use of biological or nuclear weapons has taken place. But the potentials are enormous and horrendous, and our experiential base is negligible.

The rise of Asian military power, as reflected in the adaptation of ballistic missiles and weapons of mass destruction in a connected belt of countries extending from Israel to North Korea, is a related development that cries out for broader gaming and analysis. For five hundred years the West has militarily dominated Asia by gaining control of bases on the continent’s maritime rim and by exploiting a technological advantage. It was a classic competition between the strategies of Halford Mackinder and Alfred Mahan—the former an advocate of continental land power, the latter the father of American maritime supremacy.⁹ Military geography itself is almost extinct as a subject area in the United States, replaced by a myth of the “death of distance” and an assumption that a United States able to keep its technological lead will also be able to sustain indefinitely a five-hundred-year status quo in Asia.¹⁰

There is little evidence of gaming of the competition between continental and maritime strategies. Missiles armed with mass-destruction warheads undermine the Western Mahanian strategy. Bases on which U.S. military power relies, and perhaps even the capital ships that enforce presence, are exposed to unprecedented dangers. Should the United States protect these forward bases with theater-ballistic-missile defenses? Will the cost of staying forward in Asia go up sharply as a result? These are questions that either have not been examined at all or have been looked at only in the narrow tactical context of the kill probabilities of interceptor missiles.

One of the great contributions of game theory has been to the study of the two-person game. In the Cold War, the development of the two-person, zero-sum game fit in naturally with worst-case scenarios and evaluations of

“Red” capabilities; in addition, the literature on two-person, *non-zero-sum* games brought to light many paradoxes in the estimation of threats and the role of communication. All of this work and the gaming carried out in parallel with it applied nicely to a bipolar world of the United States versus the Soviet Union. Although there were many allies involved, the “Blue bloc versus the Red bloc” supplied a good first-order approximation. Since the dissolution of the Soviet empire and the growth of the Asia-Pacific powers, this easy simplification into two-person games has become impossible. The multipolar world is far more difficult to study, from every point of view. Such problems as nuclear stability become far more complex when formally extended from two players to a multipolar world. The complications in analytics are computational and combinatoric. The complications in global strategy are more conceptual and judgmental, involving the guessing of, say, likely North Korean reactions or the future behavior of the Israelis or Palestinians.

As for the nation-state, we are all its creatures, and Americans in particular take it as an axiom that their nation is the “great melting pot.” There are Americans of many races, colors, and creeds. But the nation’s very self-image depends on trying to perfect the imperfect, the unfortunate reality of prejudice against various minorities. We cannot, therefore, dismiss the influence of communications on the “global village.” With the growth of the Internet and international enterprise, the concept of the “inhabitant of the global village,” of the citizen of the world, takes on new meaning. This is a matter not only of rhetoric and ideology but of basic social structure.

Today, a computer-literate immigrant to the United States never really leaves home. The very term “immigrant” confuses place with space. A computer programmer in Palo Alto (a place) who recently migrated from India may be in continuous touch with his family in Bangalore or with his former employers in the defense ministry in New Delhi (a space). The Dutch president of a U.S.-German conglomerate newly merged with a French-Italian-Japanese holding company may stress his loyalties to his international stockholders, but when one can no longer tell where the lines are, it is difficult to decide what side one is on. In a multi-allegiance world, an Iraqi dictator finds little difficulty in buying oil pipelines that look surprisingly like three-hundred-foot gun barrels, designed by an engineer holding a Canadian passport but whose national identity is more akin to that of Werner von Braun than that of a citizen of a single country.

World financial markets have been interlinking at breakneck speed. In many aspects of finance there is in essence a world market. A transaction in Japan can be felt in New York as though it occurred locally. There has been some concern that this interlinkage opens the door for a new form of economic warfare involving the destabilizing of markets and the deliberate creation of panics. The

evidence is not clear. Recent studies raise questions concerning the difficulties of destabilizing markets, notwithstanding popular fiction by Tom Clancy (*Debt of Honor*) and other writers.¹¹ Games that have brought in actual “inside players”—representatives of leading Wall Street banks and brokerages—seem to show that it is difficult to spread such disruption in the massively redundant marketplace.¹² Financial warfare games also show, in an unintended way, how financial priorities overtake foreign policy goals—a subject in need of much more careful analysis.

The new implications of information warfare involve misinformation and deception more than they evoke images of seamlessly functioning operations rooms with hundreds of well dressed and unflappable control personnel facing consoles and multimedia wall-display screens reminiscent of *Dr. Strangelove*. In a day when television can make nonexistent billboards (with advertisements for sponsors) seem to appear in Times Square during television coverage on New Year’s Eve, the old adage that “the camera does not lie” no longer offers the comfort it did in the days when film-doctoring was an expensive and difficult art. Paradoxically, the growth of information technology is more and more in the favor of *disinformation* technology, thanks to naive users who concentrate more on the technological wonder of the information displayed than on the context of who generated it and what it means.¹³

The theatrical aspects of military action have been grist for postmodern scholars—a literature that is unknown to the gaming community.¹⁴ Yet the close connection between visual stimulation (and manipulation) and games is well understood by Las Vegas casino operators, successful politicians, and designers of commercial video games (such as “Rainbow 6” and “Civilization”). Man is a visual animal. The imminent availability of broadband technology and Internet2[®] means that on-demand video will be as thoroughly taken for granted in the future as telephones were in the 1950s.¹⁵ This undoubtedly has many important implications for war gaming.

DANGERS PERCEIVED AND SOME RECOMMENDATIONS

The explosive growth of communication in the information age, whether in military or corporate organizations, has created a pressing need to game the bureaucratic process in its assorted pathological behaviors, jurisdictional turf battles, time delays, miscommunications, autogenerated mistakes, and propensities for random estimates, disinformation, and information vandalism.

U.S. government “estimates” of likely Boeing AH-64 Apache attack helicopter attrition in the 1999 war in Kosovo illustrate this need better than any fictional scenario ever could. In that campaign a major innovation was real-time teleconferencing, by which field commanders collectively estimated that there

would be five losses per hundred sorties for the Apache were it committed to combat against Serb military forces in Kosovo. At the Pentagon, this estimate was somehow turned into a 6-to-15 percent attrition rate; whether this growth occurred through miscommunication or reassessment using different analytical

With manual war games, it was not feasible to add “bells, whistles, and gongs”; careful thought was required in designing every single move in the sparse abstraction that constituted a game.

tools is not known. This higher number was used to brief the National Command Authorities (that is, the president and secretary of defense) on whether to employ the Apaches. At the White House the figure was again either

miscommunicated or somehow recalibrated; one senior official thought he was told to anticipate a 50 percent attrition rate. Given the political sensitivity to casualties in this operation, it was not hard to guess where this would lead. The Army had already moved twenty-four Apaches to Albania—along with fourteen M-1 tanks, two Bradley fighting vehicles, twenty trucks, and thirty-seven transport helicopters to support them—using 550 sorties of the C-17 cargo aircraft, as well as sea lift. In all, the Army had sent 6,200 troops and twenty-six thousand tons of equipment to support the Apache deployment. But when senior political leaders saw the attrition estimates (5 percent? 15 percent? 50 percent?), this immense effort went for naught. The combat mission for the Apaches was killed outright; they never flew in battle.

Strategic-bureaucracy games with a minimum of three or four teams playing the roles of different departments, with communication between them imperfect, the noise level high, and autogeneration of mistakes likely, might make a convincing case that these problems must be rectified. There are solutions. The QVC Home Shopping Network, Goldman Sachs, and other firms operate processing systems that integrate and stabilize their bureaucratic behavior, at least for mission-critical tasks. What they have done is carefully examine information, not just technology, and connect business knowledge with technical expertise.

Defense organizations, of course, face a hazard that most corporations do not—threats to security. The concern is less with the adequacy of 128-bit encryption systems than with “moles,” secretly working for opposing players. In the information age, moles can have devastating effects, because these agents work to reveal the keys to technical systems that take many years to field and that are increasingly at the heart of American competitive advantage over other countries. Consider the consequences of a Klaus Fuchs, Aldrich Ames, Jonathan Pollard, or a Ronald Pelton. Pelton, a National Security Agency technician, gave away the capabilities and coverage gaps of a multibillion-dollar U.S. surveillance

program. Inclusion of moles should be a consideration in future war game design.

There is also a need for a class of games that go beyond the traditional politico-military crisis exercise. There should be a renewed emphasis on “path games”—in which strategic decisions are made sequentially over an extended time frame, in an attempt to illuminate long-range consequences—in a collaborative effort among the war colleges, the Defense Department, and the academic community. These games should stress ten-to-twenty-year branching scenarios. At a time when the United States is the sole superpower, there is a dangerous tendency to focus only on short-term crises, overlooking the complicated and varied ways that the nation’s preeminence could be challenged. It is one thing to look at missile defenses to protect South Korea, Japan, or Taiwan against attack; the twenty-year implications of deploying theater-missile-defense systems to Asia and the Middle East are a very different matter. Such issues have not been examined even in terms of obvious measures, like the economic damage-exchange ratio of a protracted missile-antimissile competition. It would be extremely interesting in particular to run, on theater missile deployments in Asia, a twenty-year path game that included a Pelton-like mole on the “Blue” team, someone who could reveal the technical performance characteristics and vulnerabilities of the deployed antimissile system to an opposing player.

War gaming has had a distinguished past and should have an important and distinguished future. This future depends on conceiving computer games and strategy as complements to one another. There is an unfortunate tendency to conceive of them instead as substitutes. Successful IT companies do not make this fundamental mistake. Nearly all of them have obliged information technology to support the businesses, rather than the other way around.

Improvements in computing and simulation make “soft gaming,” such as the politico-military exercise, more important than ever. Because supporting information—the distance between Saigon and Seattle, or the population within a ten-mile radius of the center of Seoul—can now be obtained almost instantly, more time should be spent examining the nuances of scenarios, and more resources should be aimed at exploiting the assistance that military history, political science, and social psychology can offer.

There will always be enough money for highly computerized tactical games and simulations in the budgets of the proponents of various weapons systems. Unfortunately, the more strategic the problem, the harder it is to obtain funding to examine it. Is that because the outcomes of such studies do not look like the crisp, quantified “deliverables” of technical consultants?

NOTES

1. G. D. Brewer and Martin Shubik, *The War Game* (Cambridge, Mass.: Harvard Univ. Press, 1979).
2. Based on an informal survey by the authors, carried out in personal conversations during 1998–2000.
3. Quoted in Thomas H. Davenport and Laurence Prusak, *Working Knowledge: How Organizations Manage What They Know* (Cambridge, Mass.: Harvard Business School Press, 1998).
4. See Paul Bracken, *The Command and Control of Nuclear Forces* (New Haven, Conn.: Yale Univ. Press, 1983).
5. Istvan Deak, *Beyond Nationalism: A Social and Political History of the Habsburg Officer Corps, 1848–1918* (New York: Oxford Univ. Press, 1990), pp. 99–102.
6. See Paul Bracken, “Unintended Consequences of Strategic Gaming,” *Simulation & Games*, September 1977, pp. 283–318.
7. Davenport and Prusak, *Working Knowledge*.
8. Rob Mattison, *Web Warehousing and Knowledge Management* (New York: McGraw-Hill, 1999).
9. Paul Kennedy, “Mahan versus Mackinder: Two Interpretations of British Sea Power,” in *Strategy and Diplomacy, 1870–1945: Eight Studies* (London: George Allen and Unwin, 1983), pp. 41–85.
10. For the checkered past and present potential of geopolitics, see Mackubin Thomas Owens, “In Defense of Classical Geopolitics,” *Naval War College Review*, Autumn 1999, pp. 59–76.
11. Martin Shubik and R. L. Slighton, *The Defense Implications of the Recent Changes in World Monetary and Financial Systems* (New Haven, Conn.: 25 October 1997); and M. F. Stollenwerk, “Financial Operations: Opportunities for Inter-Agency Synergy,” U.S. Command and General Staff College, Fort Leavenworth, Kansas, 1999.
12. Economic Security Exercise, simulation played in New York City in September 1997 under the sponsorship of the U.S. Naval War College and Cantor Fitzgerald, a New York investment bank.
13. John Arquilla, *The Advent of Netwar* (Santa Monica, Calif.: RAND Corporation, 1996); and R. C. Molander, A. S. Riddile, and P. A. Wilson, *Strategic Information Warfare* (Santa Monica, Calif.: RAND Corporation, 1996), pp. 22–4.
14. Jean Baudrillard, *The Gulf War Did Not Happen* (Bloomington: Indiana Univ. Press, 1995).
15. Internet2[®] is a proposed follow-on to the present Internet being developed by a consortium of universities, industries, and government. Its primary aims are to “create a leading edge network capability for the national research community,” to “enable revolutionary Internet applications,” and to “ensure the rapid transfer of new network services and applications to the broader Internet community.” *About Internet2*, retrieved 25 October 2000 from the World Wide Web: <http://www.Internet2.edu/html/about.html>.

WAR-GAMING NETWORK-CENTRIC WARFARE

Captain Robert C. Rubel, U.S. Navy

The familiar techniques of war gaming will be insufficient for scenarios involving network-centric warfare. NCW, as it is known—with its focus on speed, downstream effects, and information flow—will require of gamers more than simply additional computational power or communications bandwidth, although these will certainly be needed. Gamers will need a new framework in which to apply these tools.

In 1886, Lieutenant William McCarty Little introduced war gaming to the Naval War College. The concept found immediate acceptance; faculty and students recognized that the war game was well suited to analyzing the characteristics of naval warfare of the time. Gaming has since been applied to all manner of warfare, in a variety of ways. As warfare has become more sophisticated,

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multidimensional, and joint, the challenges of gaming it have increased. Even the application of computer technology has not been effective for all purposes, especially in games that involve large forces. We are now facing, in network-centric warfare, a new form of conflict that will challenge gamers even more severely. In this article we will attempt to develop a framework to help us identify techniques necessary for gaming network-centric warfare.¹

A characteristic of warfare that has made it amenable in the past to simulation through gaming is its inherently structured nature. Troops operate in formations; so do ships and aircraft. Groupings of units or formations generally operate according to

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doctrine, in some specified relationship to one another. As a result, war-game designers have been able to govern and model the movements of forces and to project the results of combat with the enemy by relatively simple rules. A scenario that confines itself solely to surface ships, ground forces, or aircraft generates possible interactions and outcomes that are few enough in number for a “playable” game—one with rules sufficiently simple to allow it to be played in a reasonable period of time and at acceptable effort and expense. However, as the numbers and types of playing “pieces” grow and the flexibility of their employment doctrine increases, the difficulties of gaming by sets of rules swell almost exponentially. Today, despite the impressive increases in computing power, operational-level games involving the full range of forces (which includes space assets), even in traditional hierarchical command arrangements, must generally be controlled and adjudicated not by rules or algorithms but by the professional judgment of human umpires.²

The current state of affairs in war gaming, then, is not totally satisfactory. Still, it is possible to design and execute games that have a reasonable degree of validity. By *validity* we mean a correspondence with reality sufficient to allow useful insights to be drawn from the game’s results. Validity is achieved through careful design of the scenario and control techniques, and recruitment of players and umpires with appropriate credentials. Of course, computer models are critical, but they are usually employed “off-line”—that is, specialized models are used to support the judgment of the human umpires who ultimately decide the aggregated outcomes of complex and extensive engagements.

A BASIC GAMING FRAMEWORK

War gaming can be classified in many different ways. One common distinction is between *educational* (or training) games and *research* games. In educational games, the objective is to acquaint players with warfare situations and exercise their decision-making skills. Designers of educational games may stretch the bounds of probability somewhat in scenarios, as may control cells in move-outcome assessments, in order to ensure that players are confronted with the decision-making situations desired by the game’s sponsor—the command or entity (not necessarily the war-gaming center where it is conducted) that created the game requirement and set its objectives. Research games, in contrast, are designed to generate insights into military problems; designers and controllers attempt to inject as much realism as possible, given the inherent limitations of the medium.

Network-centric warfare would be gamed primarily for research purposes; however, of course, research games frequently have instructional value, and the proposals advanced here would apply to educational and training games as well.

War games are also classified by the way they deal with time. Some proceed in stages, known as “moves.” In each of these steps, players (or groups of players) privately assess a situation as they perceive it—on the basis of “intelligence” provided by the control cell, and within the scenario framework—and then report

Until a tactical network of units, each of them exercising a great degree of autonomy, can be simulated, it will be impossible to game network-centric war adequately.

to the controllers their intentions (force movements, dispositions, and fighting orders) for the next specified period of time. The control cell’s umpires, receiving inputs from all player cells, analyze

their interactions to identify likely combat engagements and assess their outcomes. Generally, moves cover short periods of time for tactical-level games and much longer increments for operational and strategic-level ones. In contrast to such stepwise exercises are *operational* games, which involve “moving game clocks” and present players with continuously changing situations to which they must respond. The “clocks” in such games, which are almost always computer based, typically run at four or six times normal speed. Operational games tend to be limited to the tactical level, due to the necessarily limited spans of time they can accommodate.

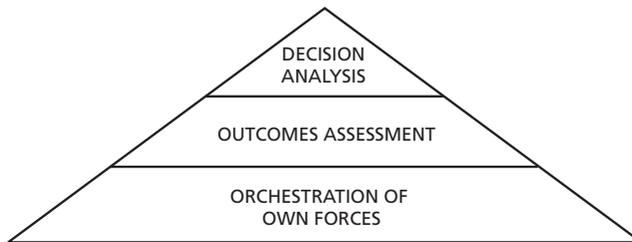
Network-centric games virtually demand moving game clocks because of the criticality of time dynamics. In other words, one of the primary benefits of NCW is that the side employing it can generate rates of change that are unmanageable for the other side’s command and control system. Because of this, a timestep-move convention would be unsuitable. A moving game clock would be sufficient for tactical-level play. However, analysts believe that NCW will produce an intermixing, or compression, of the levels of war.³ If so, it will be necessary to accommodate both short and long-term phenomena in NCW-based war games. One possibility would be composite operational and move-step games, in which “time” advances at different speeds in various portions of the game. To meet tactical-level objectives, designers would set aside periods in which players would operate against a moving game clock, alternating with move-step phases embracing much longer increments of game time. At the start of each successive operational-play session, umpires would assess the war’s progress to that point and produce a new situation for players to confront. There are probably other ways of dealing with the problem of time in network-centric games, but it is clear that traditional methods will not suffice.

In order to explore fully the needs of network-centric war gaming, however, we must go beyond traditional classification methods. The underlying structure of war games suggests a set of categories that illuminate the way in which NCW relates to traditional gaming. All war games, whether they involve fighting sail

or network-centric fleets, soldiers, and satellites, share a certain hierarchical organization. We will refer to the levels of this structure as “dimensions” (figure 1), in order to avoid confusion with the “levels of war”—tactical, operational, and strategic—which themselves form a different gaming framework.

At the bottom of the pyramid is the most fundamental dimension of gaming. If blocks representing ships are laid out, perhaps on a chart table or a grid floor, players can move them around and see directly their relationships to one another at various points.

FIGURE 1
“DIMENSIONS” OF GAMING



Similarly, the U.S. Army routinely conducts “rock drills,” in which markers (as simple as bits of stone) representing platoons or tanks are used to orchestrate maneuvers. Even complex operations, including their logistical flows, can be simulated in essentially this way, using ei-

ther physical markers or computer symbols. Many games need to go no farther. This first dimension is an extremely important aspect even of more ambitious games; the analytical or instructional usefulness of outcomes at higher dimensions of a game depends on how realistically forces are played. If tactics are used that would be impossible to execute in the real world, assessments of interactions with the enemy will be invalid.

The next dimension is assessment of outcomes, the determination of what would have happened in a confrontation of forces. Whether based upon a roll of the dice, the “crunching” of complex algorithms by a computer, or the judgment of human umpires, the outcomes form the basis for judgments of how effectively players orchestrated their forces, and for the input to be provided them for subsequent decisions. Many games stop at this dimension; such exercises are generally analytical and are meant to draw insights into the suitability of certain tactics or the efficacy of new equipment. Here again, fidelity to real-world phenomena is necessary in order to prevent distortions at the dimension of player decisions. Skewed assessments can lead to faulty analysis and to decisions that yield no useful insights.

The topmost dimension is the analysis of player decisions. Frequently the focus of educational gaming, the purpose of such analysis is to help players perceive objectively their own reactions to warfare situations. It must be emphasized,

however, that many analyses focus on aspects other than player decisions. For instance, a game intended to explore the logistics of amphibious operations might require players to develop possible courses of action; the factors affecting these courses of action might well be of more concern in terms of game objectives than specific plans produced. In order to simulate the “fog of war,” players in educational games are typically provided not the actual, precise, and complete outcome assessments—the “ground truth,” about which more below—but only those elements (or indications of them) that might realistically be observable. Research games do not often deal with this dimension, because of its indeterminate and unpredictable nature; a notable exception is the Navy’s Global War Game series.

NETWORK-CENTRIC WARFARE

Having established a baseline understanding of war gaming, we must do the same for network-centric warfare. Stripped of the jargon and mysticism that has grown up around it, NCW can be simply described as the style of warfare that is possible when individual combat units are robustly connected by information. When this is achieved, many familiar constraints disappear, and units become able to interact in many more productive ways than are possible under traditional systems of command and control. In fact, the potential flexibility is so great that centralized orchestration or management, however lightly exercised, becomes a limitation. When units know what is going on and are confident that others do as well—that is, when they have *shared awareness*—they can themselves avoid wasting efforts on enemy units that other friendly forces are engaging, or even shooting at each other. They can also render mutual support without higher-echelon coordination, fixed physical relationships to each other, or restrictive doctrine. The net effect of this new flexibility is a “swarming” warfare style that demands a fundamentally different approach to command and control than has been practiced up until now.⁴

Current U.S. practice employs layers of staffs to coordinate the efforts of command echelons below them. Plans and orders originating from a senior commander produce a series of staffing cycles in which successively junior echelons distill the orders of the next higher echelons into more focused orders for their own subordinate commanders. This cascade of planning and order writing can produce delay and confusion. In a network-centric environment, fighting organizations will be much “flatter,” because the need for intermediary coordinating layers will be obviated. However, the exact nature of future command and control requirements, should new and radical policies and techniques be adopted, cannot be determined without resorting to some form of gaming and simulation.

The principal requirements for achieving network-centric warfare are a network and shared awareness. By a *network* we mean linkage of all units and echelons of a force with all others. But merely wiring together a collection of units does not guarantee that NCW or its benefits will result; network-centric warfare is a behavioral, tactical, bottom-up phenomenon. The network cannot be achieved either merely by tuning everyone's radios to the same frequency, because voice channels alone cannot deliver the required diversity and volume of information. Nor is e-mail sufficient. We are talking about significant bandwidth, enough for simultaneous transmission of voice, video, data, and any other necessary medium of communication. All this is necessary because shared awareness is a robust phenomenon—comprehensive, responsive, adaptable, and survivable—or it does not exist at all.⁵

Shared awareness entails more than the possession of large amounts of information; in fact, flooding the network with information will guarantee that shared awareness does not occur. Some undertakings require complex graphics and a sophisticated stream of diverse media; in others, only a few words are necessary. In any case, the delivery of information is not enough; it must be absorbed and interpreted by the people within the units. Shared awareness, it can be seen, is a concept still in need of refinement by the naval warfare community. For our purposes, it is a condition in which every element of a force has sufficient grasp of its own situation and that of other friendly forces to synchronize its actions with them without detailed orders from next-higher echelons, which themselves would limit their exercise of command and control to the promulgation of broad "commander's intent."

So understood, shared awareness via networks powers network-centric warfare. In turn, the "swarming" style of warfare thus enabled will generate higher operational tempos than ever before. Because of the psychological effects of shock and paralysis that such speed promises to inflict, it may become possible to produce higher-order, even strategic, effects very quickly. It is for this reason that many writers have envisioned the weakening of the boundaries between the tactical, operational, and strategic levels of war.⁶ This compression would be furthered by information operations, which would themselves be enhanced by networking. All of this has important implications for gaming.

PUTTING IT ALL TOGETHER

Traditional war gaming employs markers, maps, and rules as substitutes for real warfare. What should gamers use to represent the network-centric environment? It seems clear that the only way to game network-centric warfare, as is the case for actually waging network-centric warfare, is to create a network of players with shared awareness. But what kind of network is needed? One of the

principal values of gaming is that it allows its practitioners to simulate warfare “on the cheap”; field exercises using real troops and ships are prohibitively expensive, especially for educational and research purposes. How are gamers to

The arena that counts in the network-centric game will be virtual, and there are as yet no adequate rules for the movement of information in that topography.

replicate a network without generating a real one? The interrelated issues of shared awareness and robust networking confound our current attempts to game network-centric warfare. Over-

laying specially designed local-area networks onto traditional command structures does not constitute a satisfactory simulation of the NCW environment. Until a tactical network of units, each of them exercising a great degree of autonomy, can be simulated, it will be impossible to game network-centric warfare adequately.

One promising line of development is *agent-based models*. These programs, fairly simple in concept but demanding considerable computer power, consist of a number of individual “agents,” virtual entities whose actions are governed by rule sets.⁷ However, merely dictating rule sets is insufficient for exploring network-centric warfare. Units in the net must be able to generate information for headquarters, and anomalous behavior on the part of a few units will be necessary in order to create realism for the players in the command center.

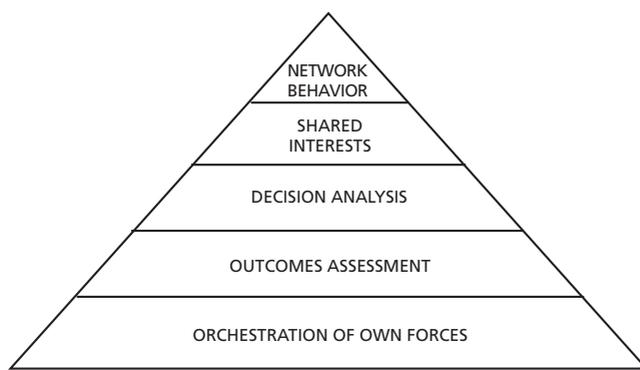
Absent a suitable model to simulate a network, an actual one will be required. To achieve that, distributed gaming will be necessary. The technology that distributes the gaming might be one that units would use in actual operations. If so, the control cell would need to generate “synthetic” forces, both “Blue” and “Red” (friendly and opposition), that would create a realistic combat environment in units’ display systems. All of this implies a much closer relationship between war-gaming centers and operational units than currently exists.

Still, a network is of no use unless players can effectively use the information it is capable of moving around. It is simply not sufficient to dump information into player cells; commanders and staffs would be quickly overwhelmed. Therefore, a prerequisite to the achievement of network-centric gaming is the development of techniques for creating shared awareness among the players. This may seem a chicken-or-egg dilemma: which should come first? However, it appears from the Navy’s experience in the latest games of its Global series that shared-awareness technology can be employed and techniques “incubated” in the context of traditional command and control structures; thereafter, they can be applied to the new network paradigm. Then, and only then, can we embark on the process of effectively gaming network-centric warfare.

A Modified Gaming Framework

With the principles of NCW gaming in mind, we can alter (figure 2) the gaming structure by adding two new dimensions, producing a framework in which the higher and more challenging dimensions rely as before upon the execution of the more basic levels. This reliance has important implications as we proceed with the development of network-centric warfare gaming.

FIGURE 2
HIGHER-LEVEL DIMENSIONS



First, as we have seen, gamers cannot ignore familiar skills and functions as they strive for more exotic applications. Errors or omissions in lower dimensions would call into question any insights derived or phenomena observed in the higher ones. That is not to say that absolute fidelity is required in all aspects; the attempt would probably result in a game that was unplayable

or too expensive. However, it does mean that designers must pay attention to the lower dimensions and find ways to simulate properly, or fix, the variables that reside there.

The alert reader may object that the two new dimensions do not belong on top of the pyramid—that they should be considered rather as parts of the lowest dimension. This objection has considerable validity, on several counts. First, it is clear that the process of getting shared awareness and networking right is akin to orchestrating the tactical doctrine of forces. Second, one might well argue that it is the analysis of human decisions that is the most difficult and complex problem in gaming. Notwithstanding, the new dimensions are here placed atop the pyramid to highlight the extensions of gaming logic that are needed to game network-centric warfare effectively.

The dimension of player decisions becomes very interesting in network-centric gaming. Since shared awareness is probably sensitive to competence of command, sponsors will have to be especially careful about whom they invite as players in NCW games. A reflexive application by a senior player of a traditional, centralized command style would probably end any hope of generating true shared-awareness behavior in a game. Moreover, players “taken off the street,” with no training in or understanding of shared-awareness theory, techniques,

and requirements will likely distort findings from games that seek to explore the various phenomena encountered.

If all this is true, several implications emerge. First, it may be necessary to change command and control doctrine before NCW can be gamed, in order to train the officers who will be the players. In other words, game designers must work closely with command and control experts to synchronize player capabilities with game demands. Second, if NCW gaming achieves any degree of validity—that is, correspondence to a future warfare environment—the education and training needed by commanders for network-centric warfare is likely to be somewhat different than is necessary today.

Third, development of NCW gaming must proceed step by step up the framework. In other words, gamers should not begin the process by lashing together a network; they need first to game shared awareness alone, in the context of current scenarios and equipment. After collecting insights and perfecting their techniques, they can move with confidence to true network gaming.

Fourth, the development of network-centric warfare war games will bring a fundamental change to the gaming environment. Traditional games, whether played on map boards or computers, are conducted by moving playing pieces around in geographical arenas; the pieces' movements and interactions are governed by rules, perhaps quite complex. In network-centric gaming, while traditional geographic displays will be used, the most important "map board" will be the human mental picture. This is not to say that a commander's situational awareness has not always been critical—it has. But it will now be especially difficult for players to keep track of what is happening in the game, because events will orient themselves around the flows of information between networked players. While game pieces (force symbols) will continue to be necessary, the arena that counts in the network-centric game will be virtual, and there are as yet no adequate rules for the movement of information in that topography. At a minimum, gamers must recognize the fundamental shift of venue and consider how it affects design, play, and analysis. For instance, whereas previously gamers would use tactical experts as umpires and analysts, in NCW gaming they may want to involve psychologists or other social scientists, as well as perhaps physiologists and physicians.

Gaming Effects

Closely paralleling the development of network-centric warfare is a movement tending to shift thinking about military operations away from input-based measures (such as sorties flown, ground gained, or targets destroyed) and toward an output-oriented focus on the ultimate effects of military actions—that which, from the commander's perspective, has been caused to happen, or prevented. A

classic, if limited, World War II example of this distinction arises from the cruiser-destroyer engagement near Guadalcanal on 8–9 August 1942: in “input-measure” terms, the result was the disaster (for the U.S.-Australian force) known as the battle of Savo Island. But because the Japanese commander, Admiral Gunichi Mikawa, focused only on the “input” measure of allied warships sunk, the tactically victorious Japanese cruisers and destroyers departed without having attacked the vulnerable U.S. invasion shipping, which had been their ultimate objective.

The desired development of effects-based measures of effectiveness will bring with it a further fusion of the three traditional levels of war. This is characteristic

It seems clear that the only way to game network-centric warfare . . . is to create a network of players with shared awareness. But what kind of network is needed?

of the emerging nature of warfare in the information age and has been predicted by many writers. It is a difficult idea to get hold of, and almost impossible if one remains tied to conventional intel-

lectual frameworks. Once again, in terms of war gaming, simply superimposing effects-based planning onto the traditional gaming approach will not be sufficient; the whole approach to planning and assessment has to change.

Presently, the same rule sets that govern the movement and engagements of “pieces” determine the consequent attrition. The strategic effects of this attrition are then extrapolated—that is, if a certain percentage of an enemy force is destroyed or a particular category of targets is hit, certain repercussions upon enemy decision makers are assumed to follow. Detailed exploration of the linkages between battlefield events and political decisions has not been a regular feature of operational-level games. Combat—the use of force itself—has been the centerpiece, and its political and moral effects usually presumed. All traditional gaming models and methods are designed according to this approach.

Some work, however, has been done on effects. The Joint Warfare Analysis Center conducts detailed and sophisticated analyses of how various types of effects can be generated through bombing and other military action. To date, most of its work has focused on what may be termed “definitive effects,” those whose mechanisms are physical—such as neutralizing an electrical generation grid or disrupting a rail transportation system. Such an effect can presumably be more easily predicted than can those that lie in the realm of belief and reason. The latter, whether catalytic or coercive, involve inducing enemy commanders or political leaders to make decisions one wants them to make. The complexities and difficulties of precipitating congenial decisions by hostile parties are self-evident. However, well-designed games might at least be able to generate useful insights into the problem.

To that end, a fundamental reorientation of the gaming process is required. Gamers must center their analyses, rules, and gaming contexts on the minds of the decision makers whom military actions are designed to influence. Models and methods must be capable of rationally depicting, assessing, and synthesizing the effects of a wide variety of events on these decision makers. In this context, the use of force is only one of an array of factors that must be considered if war games are to reflect in a valid way the influence of combat outcomes on an enemy's strategic decisions.

One way to shift gaming to an effects-centered approach is to focus on specific desired enemy decisions, to have players begin by analyzing the full range of factors, including (but not only) military ones, that might induce them. Such an approach would tend to keep players from ascribing *a priori* utility to various kinds of military actions. A sensitivity analysis might be able to identify certain types of military outcomes that would be most influential. The game proper would explore the prospects for generating those outcomes.⁸

Gaming Red

In addition to the taxonomy we have already laid out, war games can be classified as *one-sided* or *two-sided*. In one-sided games, the players are all "BLUE," or friendly; game controllers play "RED" (the enemy). One-sided games are frequently used when the sole concern is the orchestration dimension. In higher dimensions, one-sided games are most often associated with educational games; RED's actions are chosen to produce the desired decision-making situations for the players. In two-sided games, by contrast, there are both RED and BLUE players, and the opposition is free to act as it wishes; the control cell limits itself to assessing outcomes and briefing "intelligence" on them to both sides.

It might seem that if a network-centric game focused upon effects is preceded, as described above, by an analysis of factors bearing upon enemy decisions, the game itself could be one-sided, in effect a high-tech orchestration exercise. This is not the case. Network-centric warfare theory envisions that rapid operations (rapid, that is, in comparison with the enemy's ability to react) will preclude ("lock out") certain RED military options and cause the kind of decisionmaking paralysis that French commanders displayed in 1940 in the face of the German blitzkrieg. One-sided gaming could not determine if BLUE network-centric operations induced such effects. Therefore, much network-centric gaming will have to be two-sided.

In present two-sided games, RED cells typically "play" orders of battle that reflect fairly accurately those of actual states being simulated. Organizations specializing in acting as the opposition in war games (like the Office of Naval Intelligence Detachment at the Naval War College) even employ enemy doctrine,

insofar as it is understood. In network-centric gaming, however, the real key will be the accurate simulation of the enemy's command and control. Whether one-sided or two-sided, war games in which RED either is given artificially good situational awareness or is allowed face-to-face communication between all its command echelons will generate distorted outcomes. NCW game designers must ascribe networked capabilities only to player cells that would actually possess them; the RED side must be designed with realistic command and control mechanisms. Only then will players and sponsor be able to perceive the effects of rapid, network-centric operations on enemy decision making.

Ground Truth

Virtually all war games require some mechanism for keeping track of what forces actually exist (friendly, enemy, allied, and neutral), what their condition and capabilities are, where they are, what they are doing, and what they intend to do. Ground truth is, in effect, the sum of the scenario and the moves as privately submitted to controllers and mediated by umpires. Players usually are not allowed perfect knowledge and must rely on their own interpretations of the "observables" supplied to them; controllers or umpires, however, need ground truth so that they can accurately adjudicate combat results. In war games that deal solely with forces and physical geography, maintaining ground truth is a relatively simple matter; the control cells know both sides' strategies and orders, decide themselves the outcomes of engagements, and maintain a master map and status board with the true positions, movements, etc., of all forces.

In network-centric gaming, however, the focus shifts from geographic to mental terrain, and from ground, sea, and air maneuver to communications and psychology. In such a realm the very concept of ground truth, let alone plotting it, becomes problematic. It might be possible to play an NCW operational game (against a running clock) without keeping ground truth, but it would be almost impossible to analyze the play after the fact. At the very least it will be necessary, therefore, to find ways to capture each side's relative awareness and knowledge at key points. Observers might take notes in command centers, or software solutions may be found. In any case, the whole concept of ground truth will have to be reevaluated.

It is not going to be possible to game network-centric warfare by simply superimposing information technology onto traditional gaming techniques. Network-centric warfare represents in war gaming, as it does in warfare itself, a new frontier, one that will require new theory, new techniques, and new technology. It will also require new kinds of training for players, controllers, and designers.

This is not to say that traditional gaming techniques are made obsolete by the new warfare paradigm. The basic principles of game design remain largely intact. Games will still consist of players, pieces, and rules, and they must, as before, be playable at acceptable outlays of effort, time, and money. Nonetheless, game designers will not be successful in gaming network-centric warfare without adopting new approaches. It is of critical importance that they do succeed, because gaming will be vital to the adoption of this new warfare style among commanders. It will be in war games that they best learn to wage network-centric warfare and to abandon certain ingrained elements of operational and tactical art, such as fixed formations and cascading staff cycles. War gaming will be fundamental in so developing future commanders' confidence that they do not retain old methods past their usefulness, simply out of lack of trust in the new.

NOTES

1. For background on war gaming, see Peter Perla's excellent *The Art of Wargaming* (Annapolis, Md.: Naval Institute Press, 1990). For the purposes of this article, we can define a war game as a simulation of real warfare events based on: a scenario, or story, that provides the context for game moves; a playing board (either physical or electronic) that provides an environment in which the pieces can move; playing pieces (again, either physical or electronic) that represent forces; a set of rules that govern how the pieces move and interact with each other; a procedure for determining the outcome of battles; and finally (and most importantly), players.
2. The operational level is one of three levels of war commonly acknowledged by military officers. The lowest level, involving individual units up to divisions and battle groups, is *tactical*; tactics are mostly concerned with the actions of forces in contact with the enemy. The highest level is *strategy*, where the plan of war is linked to national political objectives. The *operational* level exists between the two. There, theater and joint task force commanders devise campaign and operations plans that maneuver forces so as to engage under the most advantageous circumstances, and to link the effects of their tactical actions to the attainment of strategic objectives.
3. David S. Alberts, John J. Garstka, and Frederick P. Stein, *Network Centric Warfare: Developing and Leveraging Information Superiority* (Washington, D.C.: C4ISR Cooperative Research Program, Department of Defense, 1999), p. 69; see the program site on the World Wide Web: <http://www.dodccrp.org>.
4. For more depth on the "swarming" style of warfare, see John Arquilla and David Ronfeldt, *Swarming and the Future of Conflict* (Santa Monica, Calif.: RAND, 2000). This publication is available on the World Wide Web: <http://www.rand.org/publications/DB/DB311>.
5. "Shared battlespace awareness emerges when all relevant elements of the warfighting ecosystem are provided with access to the COP [common operational picture]." Alberts, Garstka, and Stein, *Network Centric Warfare*. This is the seminal book on the subject.
6. The phenomenon of compression of the levels of war has been widely discussed in the literature. For one of the first examinations of it, see Douglas A. MacGregor, "Future Battle: The Merging Levels of War," *Parameters*, Winter 1992–93, pp. 33–47.
7. An example of an agent-based model is SWARM, developed by researchers at the Santa Fe Institute. Agent-based models have been found useful in researching complex phenomena. See the Santa Fe Institute Website, <http://www.santafe.edu>, and the SWARM Website, <http://www.swarm.org>.

8. One computer-based tool that shows promise in facilitating this type of analysis is the “Influence Net.” It is based on Bayesian inference, a mathematical technique that calculates the relative influence of one set of factors upon another. The model is applied to particular decisions to be gamed (for instance, an Iraqi decision on whether or not to use chemical weapons). Game designers would, with the help of a virtual web of outside experts, populate the model with the encyclopedic data necessary for its proper functioning.

During the game, certain cells would play combat events in a traditional manner; the outcomes would be supplied to a wider net of players who are each responding to the others’ inputs. The output of the model would indicate the proclivities of the targeted decision maker at the end of the move. For a basic description of influence nets see <http://www.inet.saic.com/inet-public/>.

GLOBAL 2000

Kenneth Watman

The focus of the twenty-second Global Game, played at the U.S. Naval War College in the summer of 2000, was to explore ways to implement network-centric operations.¹ Since its inception in 1978, the annual Global Game in Newport, Rhode Island, has been among the preeminent analytic resources of the U.S. national security community. Throughout its history it has represented “an opportunity to investigate ideas and concepts that may vary from current strategy or policy wisdom.”² From its inception, the game series has confronted defining issues: the first five years constituted a “test bed or crucible for an emerging maritime strategy,” a strategy that was to be the U.S. Navy’s fundamental concept of global warfare until the dissolution of the Soviet Union.³

Global 2000, conducted by some six hundred invited players and guests, plus gaming staff, in the College’s new McCarty Little Hall from 14 to 25 August 2000, grappled with an issue—network-centric warfare—no less crucial to the Navy’s future than was power projection in 1978–83, and it focused upon an

“emerging” document likely to shape the twenty-first-century Navy as fundamentally as did the Maritime Strategy the fleet of the 1980s and nineties—the *Capstone Concept for the Navy after Next*, being prepared by the Navy Warfare Development Command, Newport, Rhode Island. This article will examine the observations that emerged from that exercise, the directions further research should take to assess those observations, and some more general issues that arose concerning the gaming of futuristic operational concepts and combat systems.

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CONCEPTS AND PURPOSES

“Network-centric operations” are military activities undertaken by forces that are thoroughly interconnected, or netted. Such interconnection permits complete and rapid sharing of information, plans, and assessments. Given a fully functioning network, what one part of the force “knows” about the adversary or battlespace, the entire force knows; what one part “sees,” all parts see; and what one part “thinks” is available to the whole force. This is not simply a matter of efficiency and convenience: the anticipated payoffs include greatly accelerated and rapidly adaptable military operations, indeed to such an extent as to render an adversary effectively paralyzed, “locked out” of the battle. Today, however, theater-level analysis of network-centric operations is at a rudimentary stage. Much has been written characterizing these operations, in a variety of aspects, but relatively little empirical data has been produced with which to test these predictions.

Global 2000 was intended to help meet that need. For this purpose it was necessary to permit as full an exploration of network-centric operations as possible. Therefore, the game design deliberately excluded almost entirely the political constraints that in the “real world” would almost certainly not allow network-centric operations to take their own course unchecked. This lack of constraint is clearly unrealistic, but it was a necessary “laboratory condition” if the game was to help players and analysts understand the full array of phenomena associated with network-centric operations. For example, the game-control cell permitted network-centric operations to set their own pace—which was as rapid as possible—even though in a more realistic framework a “national command authority” cell would have slowed the pace of events. Further, in Global 2000 the National Command Authority permitted BLUE—in effect, the United States and its allies—to strike a broader range of targets than likely would have been authorized. Most important, the game controllers permitted BLUE to behave much more aggressively than would have been the case in the “real world.” These features of Global 2000 were deliberate and necessary artificialities, and they *in no way reflect* current U.S. policy or expectations of future intentions.

Global 2000 sought to address (but surely not completely) two primary questions. Will network-centric military operations in fact speed military operations, as predicted? If so, how will commanders and their staffs manage this increased tempo, and how will they employ the information network connecting the force elements?

The game also explored the “pillars,” or “subconcepts,” of network-centric operations, as described in the draft *Capstone Concept*: information/knowledge advantage, assured access, effects-based operations, and sea basing. *Information/knowledge advantage* is a prerequisite for effective network-centric

operations—achieving, defending, and using a superior capability to collect information and draw operational inferences from it. This advantage lies at the heart of the benefits expected from network-centric operations; for this reason, adversaries can be expected to attack it and to defend their own information. That raised a further question to be explored by Global 2000: Will the value of information produce a “fight for information” in future military campaigns, and if so, what can be said about the conduct of that fight?

Assured access refers to the ability to operate in any ocean area or airspace, when necessary, at an acceptable cost. The concept does not imply that the U.S. Navy must be able to place high-value combat assets anywhere, at any time.

Information tends to be a wasting asset: the greater one's information advantages, the greater the incentive to exploit them before they diminish, then vanish.

Rather, it means that the Navy must be able to conduct its missions wherever it needs to at a given time. The Global 2000 scenario required BLUE to gain assured access to a heavily contested, con-

finned body of water near an adversary; as a result, the gamers were able to explore a further specific question: What concepts of operations and platforms would be most useful for assured access?

Effects-based operations, of whatever size, are planned and executed so as to produce, if indirectly, particular desirable reactions. Such enemy reactions may range from sending forces in certain directions to shutting down segments of air defense systems, even to suing for peace. The purpose of conceiving military operations in terms of their desired effects is to deemphasize preoccupation with massive physical destruction of the adversary. Inducing desired effects may involve the integration of several tools, such as information operations, deception, movement, and timing, in addition to attacks upon targets. Even for physical destruction itself, effects-based planning calls for careful choices of precise targets in order to induce particular responses. This often requires painstaking analysis of an adversary's values, culture, processes, and politics, so as to hit the points, of all kinds, that will have the desired effect, and no others. The related question explored by Global 2000 was: Will effects-based operations produce military campaigns noticeably different from those conducted along more traditional lines? If not, does the concept contribute materially to advancing U.S. thinking about warfighting in general, and network-centric operations in particular?

Sea basing is a concept by which military expeditions would be conducted from the sea rather than from land bases in a theater. It recognizes that in the future land bases may be either denied politically or vulnerable to attack, especially by missiles and weapons of mass destruction. The concept argues that

the United States must reduce its expeditionary “footprint” on land, particularly that of ground forces and logistical support, by basing as many military functions at sea as possible. Global 2000 was designed to explore sea basing in general, and in particular a hypothetical large and very fast logistics ship known as the “Theater Support Logistics Vessel.” The question on sea basing examined in Global 2000 was: How and to what extent would ships with the characteristics of the hypothetical Theater Support Logistics Vessel affect the Navy’s sea-basing capabilities?

SCENARIO AND GAME “FLOW”

The scenario for Global 2000 placed the players in 2010. Between 2000 and 2010, it posited, a technologically advanced adversary (RED) had become increasingly willing to use military force to resolve its national security concerns. One such concern was a border dispute with BROWN, an ally of BLUE. BROWN’s vigorous economy and self-confident society made it a potential regional competitor, from the viewpoint of RED, which had ultimately decided to head off this eventuality through military aggression. RED’s primary objective was to disrupt the treaty obligations between BLUE and BROWN, eliminate the basing of BLUE forces within BROWN’s territory, and remove BLUE’s military presence from the region.

As diplomatic relations with BROWN grew contentious, RED adopted a military strategy that included a series of annual “active defense” training exercises, beginning in 2007. RED intended to use these exercises to cover the logistical and operational preparations for an attack on BROWN. A BLUE-led coalition, along with BROWN and GREEN (a neighboring island nation), responded, beginning in 2008, by monitoring RED’s exercises. For two years, these exercises and monitoring deployments were conducted without incident. In 2010, however, RED intended to initiate its long-planned assault upon BROWN, under the cover of its usual exercise. Its plan was to launch a limited but swift surprise attack with air and ground forces. RED intended, after the speedy seizure of secure enclaves inside BROWN, to halt and call for negotiations leading to mutual RED and BLUE withdrawals from BROWN and termination of BLUE-BROWN treaty arrangements. RED calculated that it could deter BLUE intervention, or make it excessively costly, by controlling sea and air access to BROWN and by destroying valuable and politically salient portions of BLUE’s forces, such as capital ships.

BLUE had developed a three-phase campaign plan against such a contingency. Its first element was Operation OVERWATCH, which would emplace (as part of a BLUE coalition exercise) an “expeditionary sensor grid,” a sophisticated netted collection of sensors, and then use it, when ordered, to gather targeting information on RED invasion forces. BLUE thus placed early priority on gaining the information advantage it would need to employ a network-centric strategy successfully. In

OVERWATCH, BLUE planned to establish and operate a robust C4ISR* architecture to help create and maintain a *common operating picture* of the key movements of RED forces. BLUE forces could then “network” to share information and collaborate in real time.

The second phase of the BLUE campaign plan was OVERKILL, operations against RED offensive capabilities—even if that meant firing first. In the event of hostilities, BLUE commanders were also, under this heading, to defend BROWN and to take appropriate force-protection and power-projection actions.⁴ More-

On the basis of Global 2000, it would be hard to claim that effects-based operations look appreciably different from current U.S. military practice.

over, BLUE would try to ensure access to the operating area by eliminating havens or sanctuaries from which RED might operate. The third element was Operation OVERWITH—counteroffensive

operations to eject RED forces, should they invade BROWN territory; to restore the previous border between RED and BROWN; and to reestablish freedom of navigation in territorial waters.

When the game began, OVERWATCH had been initiated; in the course of game play that phase was carried out successfully, in spite of early attempts by RED to attack the expeditionary sensor grid and inhibit BLUE's ability to profit from the information gathered. That information pointed increasingly to the imminence of RED offensive incursions into BROWN; in response, the BLUE National Command Authority approved a transition to Operation OVERKILL—large-scale operations against RED's offensive forces and infrastructure—before RED had attacked BROWN or even seriously contested BLUE's presence in the area. The BLUE political leadership based this decision on its judgment that there existed “unambiguous warning” of RED's intent to strike BROWN.

OVERKILL severely disrupted RED's planned actions and greatly weakened its assault but did not, in the event, prevent it from occupying a portion of BROWN or from delivering serious attacks on BLUE sea and air forces. Still, BLUE losses were not large enough to diminish significantly its ability to protect BROWN. BLUE accordingly began Operation OVERWITH, ground operations supported by joint and coalition air, maritime, and special operations forces. The counter-offensive incorporated high-speed maritime logistics ships and other advanced sea-basing concepts. Game controllers halted play when it was clear that RED's enclaves within BROWN were about to be eliminated.

* Command, control, communications, computers, intelligence, surveillance, and reconnaissance.

OBSERVATIONS MERITING DEVELOPMENT

Traditionally, the Global series has served both training and research objectives. With respect to the former, it has provided senior officers, particularly those of the Navy, opportunities to become familiar with futuristic systems and operational concepts, as well as with likely aspects of potential political-military crises. The participants reported that Global 2000 performed this function well, through its focus on network-centric operations and the four supporting pillars of that concept.

We must be cautious, however, in evaluating the performance of Global 2000 as a research tool. So elaborate a war game can be held only once per year. We must be especially careful not to generalize from a single game—the behavior of one set of players in the context of one scenario—to broad conclusions about the value of particular systems or concepts. War games seldom produce firm “findings,” and that is particularly true of large, elaborate, infrequently played games like the Global series. Instead, Global 2000 can best be viewed as a source of observations about systems and concepts, observations that should be tested and assessed by careful and detailed analysis.

Information/Knowledge Advantage: Obtaining Information

The expeditionary sensor grid was the single most important “force multiplier” possessed by the BLUE players. That complex system of netted sensors provided them with plentiful, targeting-quality data about RED’s order of battle, dispositions, and movements. In fact, the grid was largely responsible for the fact that the BLUE strikes against RED’s preparations for invasion of BROWN inflicted disruption from which RED never recovered. Both RED and BLUE understood, if not fully, the advantage conferred by the grid’s capabilities. As a result, the first salvo of the game involved RED attacks on the grid and BLUE operations to defend it. It can be truly said, therefore, that the first battle of the campaign was fought over information. That battle lasted throughout the campaign, concluding only when the game itself did.

The important issue that arises is how best to conduct this battle, and a general observation upon it seems in order. The process by which information is gained, used, defended, and denied has grown increasingly important and complex. We can expect this trend to continue as the information-related military capabilities of the United States grow and its operational concepts become concomitantly dependent on information superiority. This suggests that the fight to obtain and protect information superiority cannot be consigned to an annex or tab of a military campaign’s operational plan, as it so often is today. Rather, it will have to be viewed as a distinct aspect of the campaign, needing doctrine, tactics, techniques, and procedures of its own. These are now very rudimentary,

if they exist at all. The details of the “fight for information” represent an excellent candidate for intensive follow-on research.

Information/Knowledge Advantage: Managing Information

Information, once collected and defended, must be exploited properly if it is to be of value. “Exploitation” is the process of assessing information and disseminating it in usable form to the entities requiring it, all within appropriate time

Like other facets of network-centric command and control, the Knowledge Wall seems to have called for structure, constraint, and discipline.

limits. Global 2000 experimented with this command-and-control process, in part by providing players with computers (linked in a “game internet”) and software by

which information could be readily shared and moved. Players were free to post on-line whatever they felt was useful and were similarly free to retrieve anything that had been posted. Their actual use of this capability was interesting and revealing in several ways.

First, players very quickly began using the game internet with great intensity. Within one hour of the game’s start, the available bandwidth was being regularly saturated, causing the technical performance of the network to deteriorate. Analysis showed that players posted information virtually without restraint, even large data files and graphics-rich briefings and articles. Usage rules soon had to be imposed to prevent the system from becoming unusable. Second, the players were unable to assess the validity of posted information. Communications, messages, and information could be edited freely, by anyone, and then reposted; amended versions quickly proliferated. Postings intended to be directive—as commander’s intent, rules of engagement, and even direct orders—quickly became ineffectual, as players lost the ability to determine which version was authoritative. Third, players were able to use effectively comparatively little of the power of the software provided to search the net, display information in revealing ways, and process data. This was particularly true of commanders, who had difficulty moving quickly from one item of important information about the battle to another as the campaign progressed.

Many discussions of network-centric warfare have conveyed visions of a command-and-control structure akin to the civilian Internet. They presume that the natural creativity, spontaneity, and adaptability of war fighters can be unleashed by freedom from constraint analogous to that of the civilian Internet in commercial settings. No such vision was realized in Global 2000. The difficulties the players encountered may well not have been artifacts of this particular game; it should not be surprising that the civilian model of a network may not be transplantable directly into the military domain. The World Wide Web leaves

it to individual users to form their own opinions as to the accuracy of information they find there; military users have neither the time nor the resources to do so—yet the stakes for military users are quite high. The Web contains search engines; the Global game net, at least, did not. World Wide Web users often are not under time pressure; military users generally are.

For these reasons, it is hard to avoid the suspicion that whatever form a military operational net might take, the information it contains is likely to require considerable structure and “predigestion.” Doctrine will also be necessary to impose constraints on who can use the military net, where, when, and for what. The rights to post and edit will have to be limited to prevent the loss of “configuration control” observed in Global 2000. In sum, Global 2000 suggests that command and control using information networking will require a new body of doctrine, akin to that developed for traditional command and control. If so, it will be no trivial matter to balance the power of netted collaboration against the need to impose more traditional discipline.

In a similar vein, the difficulties encountered by commanders in managing and focusing the flow of information to and from themselves suggest the need for a new staff function—the knowledge manager. In Global 2000, individuals were placed in each game cell to help players, especially commanders, cope with the command and control network. These individuals, all civilians, succeeded to varying degrees; it became quite clear, however, that the knowledge-management function was much needed. Precisely how that service should be provided is an open question. Should the individuals be military staff officers or civilians? Should they be primarily war fighters or technical specialists? Should they be simply “consultants” or the commanders’ alter egos? These issues are already being grappled with today by the new and growing knowledge-management community.

Information/Knowledge Advantage: Sharing Information

Part of the command and control capability supplied to BLUE was the “common operating picture.” In physical terms, the common operating picture was represented in Global 2000 by a collection of video monitors, known as “the Knowledge Wall,” displaying the status of different military functional areas—logistics, theater air and missile defense, intelligence, surveillance, reconnaissance, and the like. At the center of this display were two large monitors showing the entire theater and the locations of various BLUE and RED units. Icons on all displays could be “clicked” upon for more detailed information. In principle, the BLUE commander and staff members could use the Knowledge Wall simultaneously and independently, as dictated by each individual’s needs.

In actual utility the Knowledge Wall fell short of the ideal, for reasons consistent with the information-related problems already discussed. The BLUE players did not need all the information the Wall provided, and they had difficulty

Many discussions of network-centric warfare have conveyed visions of a command-and-control structure akin to the civilian Internet. No such vision was realized in Global 2000.

weighing its validity. The forms in which information was conveyed were often not transparent or intuitive. The players did not have the time, training, or patience to sift the wealth of information on

the Knowledge Wall to find “nuggets” of value to them. Like other facets of network-centric command and control, the Knowledge Wall seems to have called for structure, constraint, and discipline. Again, the problem is how to provide those things without destroying the collaborative, horizontal, and largely unimpeded transfer of information that lends such revolutionary power to modern information technology.

Assured Access: Exploiting Information

The value of knowledge can be a function of time. Some knowledge may seem virtually eternal—for example, philosophic truths. But information about a military adversary has value only so long as the information is current and relevant. For example, a vulnerability is not likely to exist indefinitely. The enemy may become aware of it and correct it. Also, a vulnerability may be the transient result of a particular sequence of events—when that sequence ends, the vulnerability disappears. Specifically, adversaries preparing attacks often incur the vulnerabilities of concentration as their forces mass together; this vulnerability is alleviated when the forces disperse, perhaps during the attack itself.

Precisely this vulnerability presented itself to BLUE as RED built up forces for the incursion into BROWN. RED accepted this vulnerability in part because hostilities had not begun; it did not believe that BLUE could detect and target the massing forces.⁵ RED’s calculations proved incorrect on both counts. The expeditionary sensor grid enabled BLUE to detect and target RED’s forces, to a considerable extent. It allowed BLUE to perceive not only that an attack was imminent but also that some elements of the RED force would disperse prior to the attack, thereby becoming less vulnerable. It was for this reason that BLUE attacked when it did, while the RED forces were still concentrated. Strictly speaking, therefore, it is correct to say that BLUE was the first to attack massively the military capabilities of its adversary—though RED was in the process of “pulling the trigger.”

The larger issue raised here is straightforward: Will U.S. forces have the freedom of action to exploit their information advantages? The easy answer, of course, would be, “It depends.” Is the nation in the midst of a conflict, or does

exploiting the information advantage entail preemption? How great are the benefits of acting first? How durable are those benefits? What responses are available to the adversary? What opportunities are open to the adversary to escalate? And, of course, what are the political implications?

Though the specifics depend on the situation, it is reasonable to suspect that the broad pressures to act early felt by BLUE in Global 2000 were “real” and not game artifacts. Information tends to be a wasting asset: the greater one’s information advantages, the greater the incentive to exploit them before they diminish, then vanish. Not to act would waste the investment made to obtain the information advantage in the first place—and that investment is likely to have been considerable.

Yet the operating environments of U.S. military forces often include restrictive rules of engagement and formidable reluctance by the national command authority to permit early or independent action, and that state of affairs is likely to continue. Precisely that sort of tension developed in Global 2000 between the game political leadership and the theater military commanders, even with the artificially relaxed political constraints. The dimensions and details of this problem represent a fertile area for further research. In particular, ways of developing more flexible rules of engagement are being actively explored and will be part of Global 2001. The stakes are high; much of the operational advantage gained by network-centric operations could be thrown away by strategic-level caution, delay, or inaction. Yet such “friction” at the strategic level may be the unavoidable result of coalition or alliance influence. Coalition partners frequently find the United States too eager to act quickly and decisively, and they typically require restraint as a condition for participation in coalition operations. In such a case network-centric warfare could never achieve full expression. There may be no real solution to this problem, but we must thoroughly explore it before accepting that pessimistic conclusion.

Effects-Based Operations

Analysts of effects-based operations often assert that massive physical attacks are not a particularly potent way of creating effects with respect to an adversary’s perceptions. Whether that is true or not, effects-based operations do involve the precise control, direction, and focus of force in time and space. Frequently the concept is contrasted with “attrition-based warfare,” which conjures up images of massive, indiscriminate, industrial-style onslaughts.

In Global 2000, the players were made aware at the outset that effects-based operations constituted a focus of the game. The extent to which players actually undertook them, however, is unclear. Certainly the language of effects-based operations was spoken often by commanders and staff members; planners were

ordered to design campaigns with the aim of producing specific effects. There was, however, no common understanding of what effects-based operations entail and how to go about them. Some players envisioned influencing the adversary's highest leadership—a strategic-level definition; others applied it to the RED operational commanders; some used the term to connote information operations; yet others conflated the concept with “signaling,” using force for symbolic and demonstrative purposes. This diversity of views was aggravated by time pressure and the absence of straightforward ways to link BLUE options with specific effects on RED.

In the event, though BLUE's operations were not indiscriminate, they were massive and directed to the physical destruction of RED; it would be difficult to distinguish the aim points of BLUE weapons in Global 2000 from those of the

Global 2000 can best be viewed as a source of observations about systems and concepts, observations that should be tested and assessed by careful and detailed analysis.

weapons actually launched against Iraq a decade earlier. In sum, simple knowledge of a concept called “effects-based operations” was widely shared among the players. Much less widely

shared was an understanding of what the concept entails. Finally, on the basis of Global 2000, it would be hard to claim that effects-based operations look appreciably different from current U.S. military practice.

The research implications of this experience may be hard to implement. First, greater effort is required to clarify what effects-based operations are intended to be and how they differ from past practice. Second, research is badly needed to evaluate whether or not the theory of effects-based operations can be concretely applied in a campaign. In other words, do effects-based operations actually exist in a way that can be reliably operationalized? There is no doubt that some military operations have had effects on the enemy well beyond the physical destruction inflicted—the 1942 Doolittle raid on Japan is an example; the 1968 Tet offensive of the Vietnam War is another; so are the 1983 Beirut bombing and the events of 1993 in Somalia. The problem facing American planners is how to convert knowledge that such operations are possible into a reliable, predictable, and controllable tool for directing U.S. military force.

Sea Basing

Global 2000 was not designed to generate information sufficiently detailed to bear on platform design or choices among alternative platforms. That said, the game included a notional platform, the Theater Logistics Support Vessel (TLSV). This ship was defined only in a general way, as a large catamaran of advanced design capable of high speeds (forty to fifty knots) in the open sea and of very

quick loading and unloading. Like the expeditionary sensor grid, the Theater Logistics Support Vessel had a considerable effect on BLUE's ability to respond quickly to RED's attack on BROWN.

Specifically, the TLSV permitted BLUE to implement what is described in *Joint Vision 2020* as "focused logistics." Its speed and capacity allowed it to make numerous round trips between logistical centers and deployed ground and air forces in the same time a conventional logistics ship needs to make just one. As a result, BLUE was relieved of the necessity to project logistics requirements far ahead, and in turn, logistical stocks in the field could be substantially reduced or eliminated. The players described the approach as close to a "just-in-time" supply organization.

The speed of the TLSVs was also used to offset the problems arising when events caught a maritime prepositioning ship out of position. The BLUE commander was able to offload the prepositioning material to TLSVs, which quickly delivered it. As a result, ground operations could begin sooner than would have been the case had BLUE been compelled to wait until the maritime prepositioning ship could steam to the theater.⁶

Finally the speed of the Theater Logistics Support Vessels provided greater protection from submarine attack, in two ways. First, submarines had difficulty achieving good positions for torpedo shots (though, of course, speed was no defense against antiship missiles). Second, BLUE antisubmarine warfare forces could sweep submarine-free channels more effectively, because the TLSVs could traverse them so quickly thereafter; with slower-moving ships, submarines might have been able to reenter the cleared lanes in time. For the same reason, the swept zones could be narrower.

Much research remains to be done, however, before a Theater Logistics Support Vessel as hypothesized by Global 2000 can be seriously contemplated by the Navy. Initial assessments will focus on how Navy and Marine Corps force structure and deployments could be affected by them. If these studies and rough order-of-magnitude costing prove encouraging, more detailed analysis could be undertaken.

BALANCING CONSTRAINTS AND OPERATIONAL FREEDOM

To begin, we must again emphasize the limits of any single war game: these observations arising from Global 2000 must be viewed as tentative, fragile, the merest beginnings of further investigation. But they are nonetheless important and interesting. They all address major dimensions of network-centric operations; they are all plausible; and none can be easily explained away as a game artifact.

If a theme connects most of the observations, it is that modern information technology and current concepts for its use did not free the Global 2000

participants from the need for certain traditional constraints, at least not to the extent envisioned in theoretical discussions of network-centric operations. If a single challenge emerges, it is how to capture the predicted advantages of information-rich environments while avoiding the problems observed in Global 2000. Specifically, netted command and control still seems to require a doctrine that limits the ways the net can be used, what can be introduced into it, and who can alter what is already circulating. Further, a common operational picture does not in itself enable the parts of a force or staff to regulate themselves; some shaping and filtering of the data in that common operating picture is still required. (These are substantial problems, but certain allowances must be made at this early stage for “experimental technique.” First, the Global 2000 players may not have fully understood how to exploit the command-and-control capabilities at their disposal. They received instruction in the use of the netted command-and-control system, but one cannot expect that to offset twenty-plus years of experience in traditional modes. Second, the netted command and control provided in Global 2000 may have been poorly designed. Third, the predicted advantages of netted command and control may be overoptimistic, however effective a system and proficient its users. Global 2001 will focus on sorting out these factors.)

In addition to command-and-control issues, Global 2000 exposed tensions between the desires of theater war fighters to exploit information superiority rapidly and decisively, and those of the national command authorities and their coalition partners to proceed more cautiously. Further research will have to focus on when and how information superiority can and should be converted to operational advantage in politically complex environments. It seems likely that potential benefits of information superiority may not be exploitable under certain circumstances. In any case, how can such advantages be measured?

Finally, though it is not an issue directly related to the use of information, the concept of the high-speed logistics ship deserves further examination. It is unusual for the very existence of a single platform to have such a tangible impact on so large an exercise; this fact alone justifies more detailed study.

NOTES

1. The Navy Warfare Development Command in Newport—which prepared the document adopted as the Global 2000 conceptual framework—uses the term “network-centric operations” to subsume the more familiar “network-centric warfare” as well as settings other than warfighting. For both concepts,

see George Kasten [Capt., USN], “Building a Beehive: Observations on the Transition to Network-centric Operations,” *Naval War College Review*, Autumn 2000, pp. 127–40; Edward A. Smith, Jr., “Network-centric Warfare: What’s the Point?” *Naval War College*

- Review*, Winter 2001, pp. 59–75; and the references of both these articles.
2. Bud Hay and Bob Gile, *Global War Game: The First Five Years*, Newport Paper 4 (Newport, R.I.: Naval War College Press, 1993), p. vii.
 3. Ibid. *Global War Game*, by two figures prominent in the history of the series, examines the purposes, courses, outcomes, and lessons of its earliest games. Throughout the Cold War the series was known as the “Global War Game.”
 4. This is a good example of the liberties that were taken with political realism in order to test the full range of phenomena associated with network-centric operations.
 5. Note again the political unreality. The point is not whether BLUE would or would not actually “go first” but rather the nature of the incentives to exploit information superiority that may be created by network-centric operations.
 6. There is some question as to whether this transfer of material could in actuality have been effected so quickly and easily.

“GOOD GAMES”

Challenges for the War-Gaming Community

Stuart H. Starr

In 1999, the North Atlantic Treaty Organization issued a technical report laying out a “Code of Best Practice” for command and control assessment.¹ Although specifically aimed at command and control, this document offers a framework for thinking about the changing nature of war gaming. In the opinion of numerous practitioners and observers, war gaming has reached a turning point: the changing basis of international security at the dawn of the twenty-first century makes gaming an especially valuable tool, but a fundamental reformation of gaming is required for it to achieve its potential.

The Code of Best Practice, as a unifying and overarching framework, allows us to take stock of the present state of war gaming, to highlight the primary challenges that the war-gaming community faces, and to propose steps to improve every aspect of war gaming. It makes four central points.

First, as shown in figure 1, the framework of a good war game should be broadly based on the principles of sound operational analysis. Thus the cornerstone of any game must be a clear and unambiguous formulation of the problem to be addressed—the reason the game is to be played. A game’s sponsors need to articulate very clearly the real issues of interest so that designers may develop (for the sponsors’ approval) a conceptual framework within which these issues can be suitably analyzed.

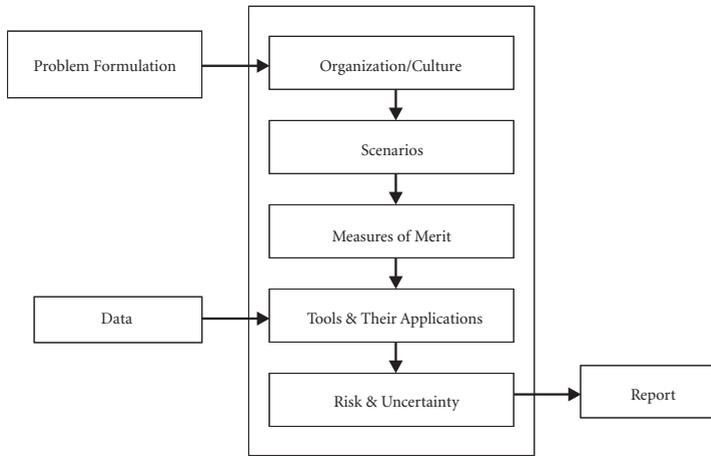
Second, as the Nato document instructs, the game’s designers should identify and address organizational and cultural issues that emerge from the conceptual framework. What assumptions are to be accepted, for example, about the values, behavior, and decision processes of the various players?

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Third, the war game must devise relevant scenarios. As is widely understood, no single scenario is adequate for the full range of issues found in a major game. Sponsors should expect to be presented with “families” of scenarios; a systematic

FIGURE 1
WAR-GAMING FRAMEWORK



and efficient mechanism to generate appropriate alternative scenarios allows a game to focus on the most interesting aspects of the problem being studied.

Fourth, Nato’s Code of Best Practice envisions the use of “measures of merit” to draw out insights about the game’s results; for contemporary scenarios, hierarchies of interrelated—and, increasingly, nontraditional—measures are necessary. These measures, in turn, require the

collection of appropriate data and the application of suitable analytical tools to be useful. For instance, ancillary tools can be used to perform analyses before a game (perhaps to define fruitful parts of “scenario space”), during it (to assess “moves”), and after it, especially to relate outcomes to measures of merit. The Nato Code considers it vital to perform risk analyses to illuminate the uncertainties associated with the issues of interest to the sponsor; many a game participant (and sponsor) has drawn a misleading inference from the idiosyncratic outcome of a single game. Finally, the results of the assessments must be documented, so there can be both peer reviews and a foundation upon which future analyses can be built.

Although figure 1 does not formally specify it, the Code of Best Practice emphasizes that an extensive feedback arrangement is needed to share insights among individuals carrying out these successive processes as game planning progresses. Further, the overall team must be an interdisciplinary one—comprising operations analysts, war-game designers, experimental designers, computer scientists, social scientists, and so on—if it is to address all of the issues of concern to a sponsor. A “good game,” then, blends clear problem formulation, technical virtuosity, accurate data, scenario creativity, appropriate decision rules, and credible evaluation procedures. The rest of this article treats some of these points in greater depth.

PROBLEM FORMULATION

There is no shortage of problems amenable to useful analysis by war-gaming techniques. In fact, policy makers are likely to find war gaming the most effective tool for clarifying many issues and sets of issues that can be expected to come to the foreground in the near and middle term. Let us here consider a few problems for which war gaming could be particularly appropriate.

Strategic Visions. An indication of the variety of problems to which gaming might be applied as an analytical tool is the set of three lists of strategic problems assembled recently by former secretary of defense William J. Perry and former assistant secretary of defense Ashton B. Carter, in their book *Preventive Defense*.² Their “A list” comprises potential (and possibly preventable) future

The overall team must be an interdisciplinary one—comprising operations analysts, war-game designers, experimental designers, computer scientists, social scientists, and so on.

matters that could threaten the survival, way of life, and position in the world of the United States (such as a resurgent and hostile Russia, uncontrolled proliferation of weapons of mass destruc-

tion, or catastrophic terrorism). The “B list” contains direct threats (detractable through ready forces) to vital American interests (for instance, major theater wars). The “C list” cites problems (like Kosovo, Bosnia, and Somalia) that “indirectly affect U.S. security but do not directly threaten U.S. interests.”³ Many of these issues, particularly those on the “A list,” have yet to be explored adequately in war games.

Homeland Defense. In its recent report, “Seeking a National Strategy: A Concept for Preserving Security and Promoting Freedom,” the congressionally established Hart-Rudman Commission emphasizes the need to enhance what it calls “homeland security” to deal with emerging world threats.⁴ A third and final phase of that study will address a variety of associated questions: Are responsibilities, authorities, and accountabilities clear? Do integrating mechanisms exist? What capabilities will be needed? Is the overall capacity sufficient, and if so, will it continue to be?⁵ A suitably designed set of war games would be a promising way to illuminate these issues.⁶

Operational Tempo. One of the driving issues in the 1997 Quadrennial Defense Review was the necessity to devise “architectures” and personnel policies to allow U.S. forces to respond to operational demands that were expected to be high enough to put pressure on unit training and maintenance, as well as morale and retention. The “Dynamic Commitment” war game was developed and played to address that issue; it is being revised to serve the same need for the Quadrennial Defense Review of 2001.⁷ That game—which is to play a single scenario, drawn randomly from a list of sixty-one “vignettes”—is itself a case in point, showing

that contemporary gaming does not reflect sufficient understanding of risks and uncertainties. The consequences of a particular vignette being played out in a single game, and of drawing conclusions therefrom about levels of demands that can be placed on U.S. equipment and personnel, are worrisome.

Service Transformation. Each of the military services is in the midst of sweeping modernization designed to take advantage of opportunities offered by the information age. Specific initiatives include the Navy's network-centric warfare, the Army's "Future Combat System for Smaller Scale Contingencies," the air expedi-

tionary forces of the Air Force, and "Operational Maneuver from the Sea" of the Marine Corps. War games have contributed to preliminary assessments of each of

How can scenarios be kept (in Albert Einstein's formulation) as simple as necessary—but not simpler?

these concepts singly, but there has been no attempt to game the totality of their effects. Doing so would appear to be a high-priority matter.

Joint Vision 2020. The chairman of the Joint Chiefs of Staff, in the recent doctrinal white paper *Joint Vision 2020*, conceives "a joint force capable of full spectrum dominance, persuasive in peace, decisive in war, and preeminent in any form of conflict."⁸ The document reaffirms as the prerequisite of full-spectrum dominance four operational concepts—dominant maneuver, precision engagement, focused logistics, and full-dimensional protection—identified in an earlier white paper, *Joint Vision 2010*. These four operational concepts in turn depend on three factors: interoperability (joint force, interagency, and multinational), innovation leading to transformation, and "decision superiority" (to allow commanders to "make better and faster decisions than their opponents"). All of these factors, as well as their relationship to the central operational concepts of *Joint Vision 2020*, are very attractive subjects for gaming.

ORGANIZATION AND CULTURE

In games played by coalition allies prior to Operation DESERT STORM, differences in cultures were sometimes recognized as a major factor. For instance, British analyses reflected a particular appreciation of Iraqi characteristics that profoundly affected the planning and operational concepts of the British forces in the theater.⁹

Cultural differences were again acknowledged as central strategic factors in 1999, during Nato's coercive air campaign to terminate internecine hostilities in Kosovo. The subsequent debate about what actually prompted Slobodan Milosevic's acquiescence to Nato's demands has produced at least one analysis of the cultural and political dynamics of the Serbian leadership.¹⁰

It has been widely appreciated that war games require a much better theoretical basis than is now available for treating these matters in future conflict situations. One potential source of some necessary insight may emerge from work being done in the Office of Naval Research on “Adaptive Architectures for Command and Control.” It examines the command-and-control staffs of various nations for pertinent “cultural artifacts” and their potential influence on decision making. In addition, the war-gaming community would do well to draw on the efforts of sociologists and political scientists, who could analyze the underlying cultural forces at work in such recent operations as Somalia and Kosovo, and who can be consulted in planning games for prospective involvement in foreseeable crises.

SCENARIOS

Today, basic issues in the selection and development of scenarios are being examined. Can a baseline scenario be used for a series (or “cluster”) of games? How can scenarios be kept (in Albert Einstein’s formulation) as simple as necessary—but no simpler? Can “excursions” into important issues be accommodated, and if so, in what ways?

Clearly, no simple answers to these questions exist, but there is a fundamental principle that game designers today should acknowledge—that no single scenario can adequately illuminate risk and uncertainty. The challenge is to develop an efficient mechanism for finding and exploring regions of “scenario space” where key factors play in significant ways. The Nato Code of Best Practice offers one approach to the problem, a scenario framework that subsumes three major categories—external factors (the political, military, and cultural situation), the capabilities of actors (friendly and adversary forces, noncombatants), and the environment (geography, terrain, and weather).

As an illustration of how such a framework might be used to develop a baseline scenario (and possibly scenario excursions), consider a methodology that enumerates the factors applicable to a given game.¹¹ For each of those factors, a number of values (specific geographies, particular orders of battle, etc.) can be assigned, each making a scenario more or less challenging in some respect that is significant in terms of a game’s objectives. Between the bounding (“easy,” “very difficult”) values for each factor lie the elements of a potentially interesting baseline scenario; alternative scenarios can be readily produced for sensitivity analyses by selecting different values for particular factors. In effect, this approach generates a very large experimental-design matrix, each cell of which corresponds to a specific scenario. In traditional scientific experimentation, a number of iterations would be run for selected matrix cells in order to achieve statistically meaningful results; statistical uncertainty would be a function of

the number of cells examined and the number of independent trials of each. In war games, of course, a “full factorial experiment” would be impossible; still, it would be prudent to play at least a sampling of variants—a “sparse, fractional factorial experiment.”

Closely related to scenarios is consideration of risk and uncertainty. As the Code notes, a useful way to display and characterize areas of uncertainty in a

Today’s state-of-practice technology simply collects stand-alone collaboration tools—however, the state of the art has advanced to the point of integrating those capabilities into “virtual buildings.”

game is to play variations of the scenario. In doing so, however, it is important to take account of, and offset, the effects of learning that occurs in the play of a game. For instance, the sequence of variations should anticipate and min-

imize the “carry forward” insights obtained in each variation; one way to do this is to make the new problem appear different to the participants but have it contain the same essential stimuli. It will almost certainly not be possible to run enough iterations to bound measures of merit as tightly as a physical scientist would wish; nevertheless, to some extent well designed pre- and postgame analyses can refine those estimates.

A more basic issue is the estimation of risk. Risk analysis as a discipline is well developed in a number of fields, such as the insurance industry and stock brokerages, but in the context of national security there is little agreement even about the definition of risk itself. This is becoming a pressing issue, because the congressional mandate of the Quadrennial Defense Review specifically requires “a comprehensive discussion of [the] national defense strategy of the United States and the force structure best suited to implement that strategy at a low to moderate level of risk.”¹² To meet this requirement the national security community will need to agree on definitions of risk, definitions that are amenable to evaluation in future war games.

MEASURES OF MERIT

For decades gamers have employed the familiar operations-analysis device of “measures of effectiveness” to structure game outcomes and relate them to sponsors’ concerns. In recent years, however, the concept of measures of effectiveness has been broadened, resulting in the idea of “measures of merit.”¹³ As discussed in the Nato document, this conception not only embraces the conventional measures of effectiveness but allows a linked hierarchy of increasingly specific metrics to be considered as well. For example, the evaluation measures of a game might employ measures each of which “nests” within the next to provide both broad and detailed attention as appropriate. An example follows:

- *Measures of policy effectiveness*, assessing the extent to which the participants in an operation are able to achieve national or international security objectives;
- *Measures of force effectiveness*, examining the purely military effectiveness of a force in terms of its primary task (such as the time required to halt an attack);
- *Measures of mission effectiveness*, appraising the ability of the military force to perform key subordinate or subsidiary missions;
- *Measures of functional performance*, evaluating the success of a particular weapon system or command-and-control organization in important tasks, such as target engagement;
- *Dimensional parameters*, the properties or characteristics (such as bandwidth and resistance to jamming) of a specific system, such as a communications network.

Game designers might usefully devise measures for each level of this hierarchy, and analysts might explore their relationships during the course of the game. At the lower end of the hierarchy, extensive analyses have been performed for traditional warfare; that literature is being expanded upon to embrace information superiority.¹⁴ It would be necessary, however, to formulate meaningful measures of merit for the top of the hierarchy. In one promising effort in this direction, economic measures were used to reflect the societal impact of military operations.¹⁵ Participants were asked to estimate the effect that postulated crises might have on such indicators as the Dow Jones Industrial Average, the price of a barrel of crude oil, or the exchange rate between the dollar and the deutsche mark.

As the Nato Code of Best Practice concludes, games are not suitable for every analytical question. Indeed, no single assessment technique is likely to be sufficient (see table 1). Since games are increasingly likely to address such concepts as information superiority and information dominance, assessment tools must account for both friendly and adversary information processes. In addition, discipline is necessary; formal experimental-design matrices may be advisable, or multiple iterations of increasingly fine-grained analytical routines may have to be done (for instance, in successive attempts before a game to identify fruitful aspects of the scenario environment, clarify assumptions, assign values for key parameters, and model details).

Newly developed sophisticated collaboration tools may revolutionize war games by allowing geographically dispersed individuals to participate fully in deliberations and decisions. Today's state-of-practice technology simply

collects stand-alone collaboration tools—like video teleconferencing, shared whiteboards, and Internet chat rooms. However, the state of the art has advanced to the point of integrating those capabilities into “virtual buildings” in which participants interact in real time. Efforts are under way to improve “scalability” (usefulness for various numbers of players and complexities of scenario) and to deal with security issues regarding the transmission of game data.

TABLE 1
SPECTRUM OF CANDIDATE ASSESSMENT TECHNIQUES

Techniques	Typical Application	Systems	People	Ops/ Mission	Resources	Lead Time		Credibility
						Create	Use	
Analysis	Closed Form; Statistical	Analytical	Assumed or Simulated	Simulated	Relatively Modest	Weeks to Months	Weeks to Months	Fair to Moderate
Constructive	Force on Force Models; Communication Systems	Simulated	Assumed or Simulated	Simulated	Moderate	Months to Years	Weeks to Months	Moderate
Virtual	War games; Human in the Loop	Simulated	Real	Simulated	High	Months to Years	Weeks to Months	Moderate to High
Live	CPX* FTX**	Real	Real	Real or Simulated	Very High	Years	Weeks to Months	High
Actual Ops	After Action Reports; Lessons Learned	Real	Real	Real	Extremely High	N/A	N/A	Very High

*CPX-Command Post Exercise

**FTX-Field Training Exercise

One of the major advantages that these emerging collaborative gaming tools offer is the possibility that principals—commanders, heads of agencies, senior executives—will be able to participate personally. The demands on the time of such individuals normally make it difficult for them to get involved in war games, especially if travel is involved; typically they must delegate such matters to subordinates. Distributed, collaborative war-gaming technologies will make it possible for actual decision makers to play, increasing both the fidelity of the games and the real value of the entire activity by educating the principals directly about the intricacies and nuances of the problems being considered.

NOTES

1. North Atlantic Treaty Organization, *Code of Best Practice (COBP) on the Assessment of C2*, RTO Technical Report 9, AC/323(SAS)TP/4 (Hull, Que.: Communication Group, Inc., March 1999).
2. Ashton B. Carter and William J. Perry, *Preventive Defense: A New Security Strategy for America* (Washington, D.C.: Brookings Institution Press, 1999).
3. *Ibid.*, p. 11.

4. Gary Hart and Warren Rudman, *Seeking a National Strategy: A Concept for Preserving Security and Promoting Freedom*, Phase II Report (Washington, D.C.: Commission on National Security/21st Century, 2000), available on the World Wide Web: <http://www.nssg.gov> (15 April 2000).
5. "Hart-Rudman Panel to Focus on Homeland Security in Final Phase," *Inside the Pentagon*, 25 May 2000, pp. 1, 19–20.
6. The Hart-Rudman Commission's final report, "Road Map for National Security: Imperative for Change," was released on 15 February 2001 (available on the World Wide Web: <http://www.nssg.gov/PhaseIIIFR.pdf>). It concluded that protecting the homeland against twenty-first-century threats "should be the primary national security mission of the United States." The report proposes answers for the institutional and organizational issues cited above, but it does not obviate the need for war games to assess critically the viability and desirability of the proposed solutions.
7. "Services Meet Snags in Readying Dynamic Commitment War Games," *Inside the Pentagon*, 27 April 2000, pp. 1, 17–8. In March 2001 the Pentagon announced that Dynamic Commitment had been postponed indefinitely.
8. Henry H. Shelton [Gen., USA], *Joint Vision 2020* (Washington, D.C.: Joint Chiefs of Staff; U.S. Govt. Print. Off., June 2000).
9. Discussions with Jim Moffat of the Defence Evaluation and Research Agency, U.K. Ministry of Defence, 4 April 2000.
10. Barry R. Posen, "The War for Kosovo, Serbia's Political-Military Strategy," *International Security*, Spring 2000, pp. 39–84.
11. See the author's "Developing Scenarios to Support C3I Analysis," in *Analytic Approaches to the Study of Future Conflict*, ed. Alexander Woodcock and David Davis (Clemensport, N.S.: Canadian Peacekeeping Press of the Lester B. Pearson Canadian International Peacekeeping Training Centre, 1996), pp. 291–300.
12. Public Law 106-65-Oct. 5, 1999, *Statutes at Large* 113: 716.
13. For a discussion, see North Atlantic Treaty Organization, *Code of Best Practice*.
14. IS Metrics Workshops sponsored by David Alberts (Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence [OASD (C3I)]) and by John Garstka (Office of the Director for Command, Control, Communications, and Computers [J6], Joint Staff).
15. Jeffrey Sands, *The Critical Link: Financial Implications of Threats to National Security* (a report on the Economic Security Exercise, cosponsored by the U.S. Naval War College and Cantor Fitzgerald, Newport, R.I., December 1997).

PUEBLO

A Retrospective

Commander Richard Mobley, U.S. Navy

North Korea's seizure of the U.S. Navy intelligence-collection—officially, “environmental research”—ship USS *Pueblo* (AGER 2) on 23 January 1968 set the stage for a painful year of negotiations. Diplomacy ultimately freed the crew; Pyongyang finally released the men in December 1968. However, in the first days of the crisis—the focus of this article—it was the military that was called upon to respond. Naval power would have played an important role in any immediate attempts to force the People's Democratic Republic of Korea to release the crew and ship. Failing that, the Seventh Fleet would have been on the forefront of any retaliation.

Many works published over the last thirty-three years support this view.¹ However, hundreds of formerly classified documents released to the public in the late 1990s offer new insight into many aspects of the crisis. They provide an unprecedentedly comprehensive documentary record of intelligence, planning, and operational issues dominating the first two weeks of the crisis, after which the Seventh Fleet began to withdraw from the Sea of Japan and the diplomatic

track assumed preeminence.

The release of these archival sources makes it worthwhile to revisit a very useful case study in crisis decision making involving naval forces. The newly available documents make plain the imperfection of the intelligence available to the operational commanders involved; caught by surprise, they had to plan and move forces quickly to respond to a wide range of contingencies. Also, the record exhibits the dynamics in Washington and establishes what

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options the decision makers there thought were available to them. Finally, it shows how military forces were in fact employed once the national strategy for the crisis was settled upon.

The newly accessible material documents four main points about the early part of the crisis. First, the U.S. intelligence community provided uneven support. Analysts supplied detailed information about *Pueblo*'s location and on the capabilities and dispositions of the (North) Korean People's Army. They also assessed how the potential allies of the North Korean regime would react to the crisis, particularly if the United States resorted to force. However, the intelligence community found the North Korean motivations and intentions—which were, of course, central to the crisis—



USS *Pueblo* Official U.S. Navy photograph

far more difficult to discern, as a result of its superficial understanding of Pyongyang's decision-making process.

Second, it is clear that within hours of the seizure, military staffs down to fleet level, whose forces had been unsuitably deployed and otherwise unprepared to protect *Pueblo*, devised and prepared to execute several options: to retake the ship, to prevent North Korea from salvaging it, to make a show of force off Wonsan, and to seize a North Korean merchant vessel. Superiors in the chain of command tempered these proposals but by no means discarded them.

Third, the released archives show that by 29 January the national command authority—the president and secretary of defense, advised and supported by the Joint Chiefs of Staff—had explored even more extensive military courses of action. The importance of the roles naval forces would have played in a number of them is striking. Although the national leadership shelved most of these proposals, some remained under consideration well into the crisis. Additionally, the staffs of the Joint Chiefs and of the commander in chief of U.S. forces in the Pacific reviewed conventional and nuclear contingency plans for Korea in case retaliation supplanted deterrence as the preeminent objective.

Fourth, the newly accessible documents trace how national strategy and theater posture effectively merged on 25 January with the implementation of Seventh Fleet's Operation FORMATION STAR. Over the next ten days, the U.S. Navy and U.S. Air Force "surged" more than three hundred aircraft into the theater to offset the unfavorable balance of air power between the two Koreas. U.S. forces in Korea itself substantially upgraded their readiness, although they did not raise their defense readiness condition. Forces of the Republic of Korea (ROK), already on heightened alert following a North Korean attempt to

assassinate President Park Chung Hee on 21 January, redeployed to contain any further North Korean provocations along the demilitarized zone.

THE INTELLIGENCE EQUATION

During the first days of the crisis, intelligence analysts supporting tactical and strategic commanders tried to answer a number of wide-ranging and fundamental questions. Their answers significantly influenced decision makers at all levels of the U.S. command structure.

What were the North's capabilities against the South? The Commander in Chief, U.S. Pacific Command, concluded that North Korea could launch a surprise attack across the demilitarized zone with the twelve divisions and one brigade then deployed near the zone. A larger attack, employing between twenty and twenty-two of the total twenty-five North Korean divisions (or equivalents) supported by about five hundred combat jet aircraft, could be delivered with little warning. The North Korean air force enjoyed substantial superiority over its Republic of Korea counterpart. All of its fighters (MiG-21s, MiG-19s, and MiG-17s) and some of its Il-28 bombers were dispersed in caves and revetments; its fuel storage facilities were dispersed and "hardened" (strengthened to resist damage, as by concrete bunkers). In contrast, the air forces in the South comprised 203 Korean fighters and 151 American fighters, at unhardened bases. Aircraft, fuel stocks and terminals, radar sites, communications centers, and surface-to-air missile sites were all vulnerable to low-altitude surprise attack.

This airpower imbalance and the exposed nature of the airfields in South Korea became a major concern to U.S. decision makers.² The commander in chief of Pacific Command subsequently concluded that seventy aircraft would be lost to the first wave of a North Korean air campaign against aircraft on the ground, and 110 to the second wave.³ As for the North Korean navy, however, the Central Intelligence Agency characterized it as a small defensive force, limited to coastal operations.⁴

What was the North Korean army's posture? Following the seizure of *Pueblo*, North Korean military units assumed a heightened state of alert and maintained it throughout the early days of the crisis. Analysts believed that the alert was defensive; there were "no signs of significant preparations for offensive action."⁵ For example, the CIA reported that as of 28 January, North Korean naval patrol activity remained heavy, particularly off Wonsan on the east coast, where it extended thirty miles into the Sea of Japan.⁶

What had been Pyongyang's objective? The CIA, the Defense Intelligence Agency, and the State Department rapidly concluded that North Korea had acted independently.⁷ *Pueblo's* seizure had grown out of the regime's desire for unification; Pyongyang's public statements had become more militant since October 1966. On top of this, the CIA noted, North Korea had been "uniformly

hostile” toward all vessels in nearby waters since the Korean War. In fact, few South Korean or U.S. ships ever approached North Korea’s coast; the exceptions were ROK Navy patrol boats escorting fishing vessels. The North had sunk one of these patrol boats in 1967 and in November 1967 had resumed accusations about “spy boats” (which had begun around 1964).⁸ Detecting *Pueblo* off its coast at least by 22 January, the North would have been sorely tempted to harass it, at least; two North Korean fishing trawlers had circled and approached to within thirty yards of *Pueblo* on that day.⁹ The CIA assessed that the “report which the trawlers probably made would have been enough to justify making plans to deal with the *Pueblo* and sending a naval vessel out on patrol.”¹⁰ The CIA concluded that the ship

was almost certainly taken as a result of a decision at the highest levels of the North Korean government. . . . It seems likely . . . that the North Koreans had identified the ship and her mission at least a day in advance. It is possible that the original intent was only to harass and drive off the *Pueblo*; the final decision to take the ship into Wonsan may have only been taken when it eventually appeared that U.S. forces were not coming to assist the *Pueblo*.¹¹

In any event, the CIA quickly warned senior U.S. officials that the North Korean regime was prepared for a “period of sharply heightened tensions.”



It assessed that Pyongyang would seek to extract propaganda value from the crisis “for some days at least.” Interestingly, the initial CIA assessment implied a role for U.S. military pressure, arguing that the North Koreans would release neither ship nor crew “unless they judge the U.S. will resort to retaliatory action, such as an air attack against the patrol craft that seized the *Pueblo*.”¹²

Where was *Pueblo*? The United States had tracked the newly captured ship into Wonsan. A photo-reconnaissance mission flown on 25 January confirmed it was still there, along with seven Komar missile patrol boats and several patrol craft.¹³ The imagery revealed no damage to the ship.¹⁴ On 12 February, human intelligence reporting indicated that the North Koreans had moved *Pueblo* from

Changjahwan-man (Chojikan) to Munp'yong-ni (Wonsan), a naval facility nearby.¹⁵ On 29 April, the Defense Intelligence Agency reported that *Pueblo* had moved from Munp'yong-ni to Najin, a port near the Soviet border.¹⁶

What were North Korea's economic and political vulnerabilities? North Korea's predominantly overland trade patterns and communist trading partners were not susceptible to naval action or diplomacy. The CIA quickly reported that approximately 87 percent of North Korea's trade in 1966 was with the communist world, 75 percent with the Soviet Union and China. With the exception of bulk commodities, almost all of this trade with its two bordering neighbors was overland. Japan accounted for nearly half of Pyongyang's noncommunist trade. Therefore, a maritime blockade could reduce North Korea's trade by no more than 25 percent, representing that with the noncommunist world and with communist countries other than China and the Soviet Union. Japanese and Soviet-flag ships would be primarily affected; they represented roughly two-thirds of all merchant ships entering North Korean ports. The remainder were Polish and British (8 percent each), Greek (5 percent), and an assortment of other ships flying free world and communist flags.¹⁷

North Korea had only five merchant ships of its own (a sixth was being fitted out in Nampo) that could be seized in retaliation; the locations of those not believed to be in port were unknown. Four were attached to the fishing fleet. All were under two thousand gross registered tons, except *Paektu-San* (7,218 tons). The status of three Polish-flag dry-cargo ships operated by the Joint Korean-Polish Ship Broker's Company was continually monitored.¹⁸

The Central Intelligence Agency painted a picture of a North Korea with similarly few political vulnerabilities. All communist states would wish the affair to "inflict the maximum feasible damage on the U.S. position, particularly with reference to Vietnam." Still, while these allies would want to hinder U.S. efforts in Vietnam, the CIA believed, none sought hostilities on the Korean Peninsula. Moscow, accordingly, would seek propaganda points but would counsel Pyongyang to avoid further provocations that might trigger U.S. retaliation. Nonetheless, the agency warned, Moscow might not be able to restrain Pyongyang should the latter pursue a more belligerent course. China would probably offer ambiguous advice but counsel against "any course of undue risk." Both states were aware that South Korea could also take actions, with or without U.S. concurrence, that could "balloon the crisis out of control." This factor, the CIA believed, gave Moscow and Beijing an additional incentive to moderate their advice to Pyongyang.¹⁹

What if the United States attacked? By 26 January, the intelligence community had begun to assess likely North Korean responses to several possible U.S. actions. The State Department judged that there was "a fair chance" that the

communist regime would release at least part of the crew in response to a combination of warnings, visible military preparations, and a U.S. show of force. Pyongyang would probably see little to be gained from holding the entire crew after exploiting the incident for propaganda value. This outcome could not be guaranteed. Moreover, the assessment observed, shows of force and the like could be “damaging” to South Korea. Further, the communists might regard some low-level military action (such as a blockade, attacks against a limited set of North Korean targets, etc.) as meant only to assuage American public opinion; they might doubt U.S. determination to go farther. In such a case, the North Koreans would probably “punish” the crew immediately. They might retaliate by launching air strikes against South Korean airfields or even U.S. aircraft carriers,

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though such acts seemed unlikely, because of the high risk of escalation and ground war. In fact, a State Department memorandum suggested, were the United States

to strike North Korea, the Soviets would probably go “quite far in private pressures” on Pyongyang to end the crisis—regardless of their public stance. Still, no foreseeable scenario guaranteed the crew’s release, let alone that of the ship.²⁰

What were the Soviets doing? The Soviet Union apparently acted quickly to harvest the intelligence windfall that had been brought into Wonsan Harbor. On 28 January, the CIA reported that a Soviet Pacific Fleet aircraft had made a highly unusual flight into North Korea. The agency believed that the aircraft might have carried Soviet personnel to examine *Pueblo* and its surviving equipment.²¹

The Soviet Pacific Fleet also deployed several units to monitor the growing U.S. task force. By 1 February, U.S. naval intelligence was tracking a Kildin guided-missile destroyer, a Kotlin destroyer, a Riga destroyer escort, and four auxiliaries in the Sea of Japan. On 5 February (after some of the U.S. Seventh Fleet ships had departed), six Soviet destroyers steamed into the Sea of Japan. By then, thirteen Soviet vessels—including two missile cruisers, three missile destroyers, two tankers, and two intelligence collectors—were in those waters. However, some of these were probably reliefs for ships that had arrived previously.²²

What more could be determined? Surprised by the ship’s seizure, national decision makers were starved for information. On 24 January the senior *Pueblo* crisis group met for the first time; its members included Secretary of Defense Robert S. McNamara, Secretary of State Dean Rusk, and certain of his principal assistants; Walt Rostow, the national security advisor; Richard Helms, the director of central intelligence; and General Earle Wheeler, the chairman of the Joint Chiefs of Staff. (The president was to attend several of its meetings but was not present for the first.) General Wheeler felt that the first thing to do, before

any of the military actions under discussion could be implemented, was to collect more photo intelligence.²³ McNamara agreed that the intelligence gaps had to be filled; he hoped to have a reconnaissance plan from Helms by day's end. Planners considered both drones and BLACK SHIELD (probably involving the SR-71 Blackbird, the only aircraft capable of safely flying a reconnaissance mission against Wonsan). At a cabinet-level meeting on the evening of 24 January, Helms pushed for three reconnaissance passes (presumably by BLACK SHIELD) in one day over Wonsan. McNamara endorsed a three-pass mission, arguing that the loss rate would be low. The first useful imagery was obtained the next day; after preliminary interpretation, it was to be shipped to Washington by Sunday, 28 January. The United States also continued to fly BUMBLE BUG drone reconnaissance missions. The drone, which was launched from a C-130 aircraft, was scheduled to fly on 29 January. On the 29th, however, the advisory group agreed to suspend reconnaissance against North Korea for several days.²⁴

THE INITIAL RESPONSE IN THE THEATER

The documentary record shows that as the national command authorities began in the first twenty-four hours to formulate a strategy for dealing with the seizure of *Pueblo*, forces in the theater were already preparing to carry out any of several retaliatory contingencies. The commander of U.S. naval forces in Japan notified the commander in chief of the U.S. Pacific Fleet (a component of the Pacific Command) of the seizure at 1420 (2:20 P.M.) Korean time, within an hour of the event.* For the commanders and staffs of the Pacific Fleet and its subordinate Seventh Fleet, preparations entailed rapid planning and redeploying of units. The Air Force also began moving the first of several hundred aircraft toward or into the Republic of Korea. The Commander, U.S. Forces Korea, with headquarters in Seoul, heightened his forces' alert and surveillance status and considered increasing readiness from the normal Defense Condition Four to DEFCON Three.

The Pacific Fleet staff considered many options, some of which anticipated the more deliberate assessment process that would occur in Washington over the next six days. These options included requesting permission to conduct land-based or naval air strikes against "a suitable target"; steaming a carrier task group into the Sea of Japan and conducting photo reconnaissance; seizing a North Korean ship on the high seas; positioning *Pueblo's* sister ship, USS *Banner* (AGER 1), off Wonsan; disposing naval forces in such a way that the U.S. government could credibly demand compensation, apologies, and guarantees from North Korea; and blockading Wonsan.²⁵

* To simplify the chronology, all dates and hours are in local Korean time.

Many naval messages, several of them later revised, resulted from the planning in the theater. At 1506 on the afternoon of the seizure, the commander of the Seventh Fleet directed the nuclear-powered aircraft carrier USS *Enterprise*

Within hours of the seizure, military staffs, whose forces had been unsuitably deployed and otherwise unprepared to protect Pueblo, devised and prepared to execute several options.

(CVN 65), the nuclear-powered guided missile cruiser *Truxtun* (CGN 35), and three destroyers to proceed “at best speed” to the southern end of the Tsushima Strait.²⁶ Between six and seven

that evening, Pacific Command ordered its forces to prepare for photo reconnaissance of Wonsan to determine *Pueblo*’s position; at about the same time, the commander in chief of the Pacific Command requested the Joint Chiefs to authorize this reconnaissance if North Korea remained silent as to the ship’s location.²⁷ As a precaution, USS *Banner* was ordered to discontinue surveillance operations off the east coast of Honshu and return to Yokosuka.²⁸

At 1921 (7:21 P.M.), the commander of the Pacific Fleet directed the commander of the Seventh Fleet to “take steps to place and support [a] destroyer ASAP [as soon as possible] off Wonsan immediately outside 12-mile limit. Be prepared to engage in operations that may include towing *Pueblo* and or retrieval of *Pueblo* crew/provide air cover as appropriate. Make sitreps [situation reports] as appropriate and at least hourly.”²⁹ The Seventh Fleet staff amplified this order seventy-five minutes later, directing *Enterprise* into the Sea of Japan and sending the destroyer USS *Higbee* (DD 806) toward Wonsan; a second destroyer would follow.³⁰ At about the same time the Pacific Fleet commander also directed the Seventh Fleet commander to conduct photo reconnaissance missions over Wonsan.³¹ The commander of the Seventh Fleet relayed this order at 2334 but advised his subordinates that since *Pueblo* was believed to be inside North Korean territorial waters, no offensive military action was authorized unless directed by higher authority.³² Shortly after midnight, the task group commander onboard *Enterprise* responded that he planned flight operations during daylight from a position east of Pusan to rearrange the air wing for future operations.³³

Evidently, the national command authorities suddenly put the brakes on this planning, preparation, and northward surging of naval forces. At 0138 in the morning of the 24th, the Pacific Fleet commander directed all U.S. naval forces to remain south of thirty-six degrees north latitude and to make no show of force in the area of the incident; no destroyer would be positioned off Wonsan.³⁴ Furthermore, by seven o’clock the Pacific Fleet commander had also directed the cessation of signals-intelligence flights over the Sea of Japan and Yellow Sea. Further, no antisubmarine warfare flights were allowed near the incident site, with the exception of a two-plane barrier near the battle group.³⁵

Half an hour later, the commander in chief of Pacific Command confirmed that the Joint Staff had prohibited shows of force. He explicitly directed the commander of the Pacific Fleet not to position *Higbee* off Wonsan; other fleet units repositioned as a result of the incident were to steam no farther north than their present locations.³⁶ *Enterprise* had advanced as far as the northeast end of the Korea Strait, south of Pusan; by noon, to gain sea room, the carrier had withdrawn southwesterly into the East China Sea. *Higbee* and three other destroyers, *Osbourn* (DD 846), *Collett* (DD 730), and *O'Bannon* (DD 450), were to rendezvous with *Enterprise* there between the 24th and 26th of January.³⁷

By midday on 24 January, the commander in chief, Pacific Command, took further steps to reduce the risk of war, ordering his subordinate commanders to “initiate no show of force along the Korean demilitarized zone or elsewhere adjacent to North Korea. . . . U.S. naval and air forces will remain outside repeat outside of the area within 80 NM [nautical miles] of the coast of North Korea north of a line extending east from the DMZ [demilitarized zone]. This instruction does not alter your existing authorities and responsibilities for the security of your forces.”³⁸

Meanwhile, the U.S. Fifth Air Force had ordered all available F-105 fighter bombers from Okinawa to Kunsan and Osan in Korea. Twelve F-105s deployed to Osan by the 24th, and the Air Force began planning for a massive augmentation.³⁹

The commanding general of the U.S. Eighth Army in Korea notified his forces of the *Pueblo* seizure and directed I Corps to bring its command posts to operating strength. He instructed subordinate commands to heighten their alert states and to review Defense Condition Three procedures. (In the event, the defense condition was not raised from four to three for U.S. forces.) Meanwhile, major elements of American and South Korean forces remained engaged in counterinfiltration operations, which had accelerated after the North Korean attempt to assassinate President Park on the 21st.⁴⁰

General Charles H. Bonesteel III, commander of U.S. forces in Korea, was particularly concerned about the active infiltration threat to the security of surface-to-air missile and nuclear weapons sites. On the 24th he reported that he was considering deploying another battalion from the U.S. 7th Division to reinforce local defenses of these sites. Bonesteel also recommended an “expeditious decision” to augment the Eighth Army, particularly for local security. Concerned with the maritime borders, he indicated that he might soon recommend that two U.S. destroyers and maritime patrol aircraft reinforce the South Korean naval and air force units then conducting maritime patrol and interdiction.⁴¹

REVIEWING THE MILITARY OPTIONS

Although diplomacy was quickly to become paramount, during the early phase of the crisis the national command authorities devoted much time to military options. Between 24 and 27 January, a series of meetings of the *Pueblo* crisis group, the National Security Council, and the cabinet occurred. The early meetings were wide-ranging brainstorming sessions in which the participants strove to understand the facts of the case, ascertain North Korean motives, and then identify and evaluate military and diplomatic options. The policy makers were conservative; they sought to bound the crisis, and their paramount goal became the crew's return. But they also wanted to consider ways to pressure Pyongyang. On Friday, 26 January, the State Department established an interagency Korea Working Group, comprising representatives from the State and Defense Departments, the Central Intelligence Agency, the Agency for International Development, the White House, and the U.S. Information Agency. The group was to flesh out ten options in "think papers" addressing purpose, feasibility, risk, and North Korean response. A high-level advisory group met on Monday, 29 January, to weigh these ten possible courses of action and the working group's evaluations of them.⁴²

Selected air strikes on North Korea: As a retaliation for *Pueblo's* seizure, ninety-two Navy, U.S. Air Force, and South Korean air force aircraft could strike the Wonsan air base and the naval base at Mump'yong-ni.⁴³ The Korea Working Group cautioned that the strikes would not free the crew or substantially reduce, let alone disrupt, North Korean military capabilities. Attacks would be difficult to defend legally; they would put the United States on the diplomatic defensive; and they would risk escalation. In its report, the working group noted that the Joint Chiefs preferred to attack *all* North Korean military airfields and neutralize the *entire* North Korean air force in this course of action. Otherwise, losses of strike aircraft would be high, since the North Korean air defense system could concentrate on defending one or two targets.

Naval blockade of Wonsan: Given air cover, U.S. and possibly South Korean naval units could impose a blockade within Wonsan's twelve-mile limit. To achieve air superiority, strikes against North Korean air force fields would "quite possibly" be required. However, the Korea Working Group assessed that a blockade would pose only a minor inconvenience to the Democratic People's Republic. Moreover, if the North Korean regime did not respond in the desired way, the United States might be committed to an "indefinite, inconclusive, and politically awkward" military option. World reaction would be adverse. Nevertheless, the working group concluded that a blockade might eventually be useful.

Mine Wonsan Harbor: *Enterprise*-based A-6 attack aircraft could, by flying seventeen sorties, drop eighty-three mines in one night; thereafter they could

“reseed” the minefield as necessary. The working group projected the aircraft loss rate at less than 2 percent. On the other hand, it argued, mining would pose only a “minor inconvenience,” given the availability of other North Korean ports and the possibility of Soviet mine countermeasures assistance.

Seize North Korean vessels: The purpose would be to retaliate in kind and then trade the seized craft, either a merchant vessel or a warship, for *Pueblo* and its crew. This option, the Korea Working Group believed, would be difficult to im-

The policy makers were conservative; their paramount goal became the crew’s return. But they also wanted to consider ways to pressure Pyongyang.

plement because the North’s five primary merchant ships and most of its naval units were unlikely to be under way. While not deemed risky, this option seemed to have little chance of securing release of

the *Pueblo* and, more importantly, the crew; it might, though, be “advantageous” as a step in a “sequence of events.”

Sail USS Banner into the area where Pueblo had been seized: This complex operation would demonstrate U.S. determination to exercise freedom of the seas. The idea was to position *Banner* a minimum of thirteen miles from the North Korean coast for eight days. Two destroyers, a cruiser, and possibly a South Korean unit would escort the *AGER*, and carrier aircraft would fly cover overhead. U.S. Air Force aircraft in South Korea would assume “strip alert” (immediate readiness to take off). The working group felt that the action would involve low risk but would reduce the likelihood of the release of *Pueblo* and its crew. Nonetheless, the group recommended that a plan be prepared for this option, in case Washington decided to carry out a “relatively unprovocative” operation.

Recover cryptographic material jettisoned by Pueblo: An attempt would be made to recover highly sensitive gear while exercising freedom of the seas. The recovery would require a tug and mine warfare vessels from Sasebo, Japan, along with special detection gear from the United States, and probably a midget submarine (to be flown from Nassau). *Enterprise* and U.S. Air Force aircraft would provide air cover. The salvage unit would operate during daylight only and terminate the attempt after ten days. The working group stated no opinion on the prospects of recovery but in general concluded that a recovery effort would constitute “a legitimate display of U.S. activity and concern for U.S. rights with little risk of provocation.” Supporting the course of action was a draft operation order. However, the letter from Admiral Thomas Moorer, the Chief of Naval Operations, forwarding the draft plan commented that its “disadvantages far outweigh its advantages” and recommended against it unless the recovery units were assured of adequate air cover.⁴⁴

Conduct airborne reconnaissance: This proposal entailed flying reconnaissance missions in an attempt to convince Pyongyang that the United States was preparing for military operations. High-performance tactical aircraft or drones

“I don’t believe there is any military move that we can make that will assist us in getting the Pueblo crew returned.”

would cross the demilitarized zone and North Korean coasts and penetrate up to fifty miles inland. Electronic warfare aircraft would jam air defense and

surveillance radars. North Korea would likely down several drones, but the risk to BLACK SHIELD missions was calculated at less than 1 percent, even against experienced surface-to-air missile crews. The working group concluded that reconnaissance had some value as a pressure tactic.

Inform the Soviets of actual or possible military moves: Officially, the Soviets would be advised that ongoing military movements were meant to deter further North Korean provocations; in addition, however, “we might pointedly warn the Soviets of actions we may be compelled to take.” In this scenario, Washington would use an unofficial channel to warn Moscow of the “gravity of the situation” and the need for “some action by the North Koreans to avoid further deterioration.”⁴⁵ The State Department was to develop this option in greater detail as the crisis progressed.

Raid across the Demilitarized Zone: A punitive raid across the demilitarized zone could be staged against a significant installation, such as the North Korean 6th Division command post. Relying on surprise, an armor-heavy combined U.S.–South Korean force would seize and destroy the facility. The working group, however, warned that the raiders would sustain high casualties and that the North Korean military should be expected to mount rapid “counter activities.” Moreover, if the operation went poorly, it could result in escalation to major ground action; even if successful, it would be merely punitive.

Economic pressure on North Korea: This proposal entailed a total embargo on trade by the United States and its allies, particularly a cessation of Japanese imports from North Korea and elimination of wheat exports to it. (Japan was the largest free-world importer of goods from North Korea, and wheat accounted for half of the free world’s exports to that nation.) The Korea Working Group saw little prospect for success: communist shipping lines and overland routes would compensate for the loss of free-world vessels, and in any case key U.S. allies trading with Pyongyang were unlikely to cooperate.

On 29 January, a senior advisory group including Rusk and several high-ranking State Department officials, Helms, Rostow, and General Maxwell Taylor (then acting as a special military consultant to the president) met to review the operational alternatives offered by the Korea Working Group. The

advisory group rapidly and “universally” agreed that the United States should make no further military or diplomatic moves until it could ascertain whether U.S.–North Korean contacts at Panmunjom might be fruitful. The panel quickly eliminated several possible courses of action: in its view, selective air strikes were solely retaliatory and would diminish prospects for early release of *Pueblo*; blockade was inconclusive and potentially escalatory; and mining risked air

“If diplomatic efforts . . . are not successful[,] . . . the conventional weapons strike plan we have submitted gives various options. . . . We also will be ready with various nuclear options.”

combat and escalation. The panel further ruled out putting *Banner* on station, at least in the manner proposed, and concluded that recovery of the *Pueblo*’s cryptographic material was “almost an

impossible task”—the attempt could lead to “unsought sustained hostilities.” The meeting found free-world economic pressure unattractive, because of its limited impact and the difficulties of implementing it, especially since opposition from France, the United Kingdom, Japan, and West Germany was likely.⁴⁶

The other options were received more favorably. In particular, if the crew and the ship—or even just the ship—were not returned, seizure of a North Korean vessel seemed to be a “punishment that fitted the crime.” The panel recommended further staff work to locate North Korean vessels that might be susceptible to seizure in international waters.

The senior advisory group, however, recommended suspension of reconnaissance for several days. If these flights were to be resumed, the panel recommended they be BLACK SHIELD missions. The group also recommended that the United States consider bombing exercises in South Korea, for their demonstration value.⁴⁷

After its deliberations, the panel met with President Lyndon Johnson. It advised him that “[we] should keep our eyes on the major objectives in this crisis: get the men of the *Pueblo* and, if possible, the ship returned; keep the confidence of the South Koreans and, especially, their willingness to provide an increment of force in South Vietnam; and avoid a second front in Asia.”⁴⁸ Meeting privately with Democratic congressional leaders the following week, President Johnson echoed the theme: “We are trying to keep them [the North Koreans] talking. The Joint Chiefs have shown me twenty military plans, but none of them would get our men back alive.”⁴⁹

Admiral U. S. Grant Sharp, commander in chief, U.S. Pacific Command, made the same observation, but with a weather eye out for the possibility of things going amiss. In a “personal for” message to the chairman of the Joint Chiefs, he summarized the planning:

Our chances to get the crew back seem greatest if we do not make a show of force off Wonsan. . . . I have told CINCPACFLT and CINCPACAF [Commanders in Chief, Pacific Fleet and Pacific Air Forces] to caution their people that we want no belligerent statements from anyone at this juncture and that they should caution their people to remain quiet. . . . I don't believe there is any military move that we can make that will assist us in getting the *Pueblo* crew returned. . . . If diplomatic efforts for return of the *Pueblo* crew are not successful then we should consider moving *Banner* and escorts off Wonsan in accordance with the plan I have submitted. We could easily stir up a hornet's nest with this move and we must be prepared to take such steps as necessary to come out on top. The conventional weapons strike plan we have submitted gives various options for this contingency. We must also be prepared for retaliatory strikes against South Korea. Mining of Wonsan and/or Hungnam and the harbor on the west coast [Nampo?] can be accomplished without great difficulty. It should have a salutary effect on North Korea if a move of this severity is required. We also will be ready with various nuclear options. . . . I am not sure any of these military moves will assist in getting the *Pueblo* crew back but they would teach North Korea a lesson.⁵⁰

The national command authorities thus at least temporarily ruled out most forcible options, although they had already taken steps to prepare for a wide range of military contingencies. Some measures were visible immediately. On 25 January, some reserve units had been called up, terms of military service had been extended, and 361 aircraft had been ordered into the western Pacific. The White House had approved moving additional carriers into the Sea of Japan, stationing more aircraft in South Korea, and alerting thirty-six B-52s for movement to Okinawa and Guam. The Joint Staff had also taken unpublicized steps to enhance readiness for war on the Korean Peninsula.⁵¹

PREPARING FOR MANY CONTINGENCIES

On 25 January, upon Washington's commitment to augment the U.S. presence in the Sea of Japan, the Seventh Fleet implemented operation FORMATION STAR. The operation order directed the *Enterprise* task group to prepare for a number of operations: assuming custody of and towing *Pueblo*; receiving returned U.S. personnel; conducting photo reconnaissance of Wonsan; and executing retaliatory air strikes or "other offensive actions as directed." The task group was to remain, and conduct flight operations, south of the thirty-eighth parallel; however, immediate ("hot") pursuit was authorized north of that line, and ships and aircraft could operate north of it to protect friendly forces. U.S. units were not authorized to penetrate the territorial sea/air space of the People's Democratic Republic.⁵² Shows of force were prohibited; if attacked, however, the task group was to take "immediate and aggressive protective measures." In addition to the

Seventh Fleet measures, the South Korean navy had placed nineteen ships and two fast patrol boats in sixteen patrol sectors around the Republic of Korea.⁵³

By 1 February, the task groups of the carriers *Enterprise*, USS *Ranger* (CV 61), and USS *Yorktown* (CVS 10) had arrived in the Sea of Japan and formed a task force.⁵⁴ The Joint Chiefs had also directed the Pacific Command to deploy up to nine diesel and nuclear attack submarines to Korea “as soon as practicable.”⁵⁵ The *Banner* was to augment the force; Pacific Command directed the Seventh Fleet to get the intelligence collector under way to join the task force as soon as feasible. The move was symbolic: “Technical collection capability is secondary to this mission and should not repeat not delay sailing.”⁵⁶ *Banner* rendezvoused with the force on 31 January but remained clear of North Korea’s claimed territorial waters.⁵⁷

During the first two weeks of the crisis, the Air Force had deployed aircraft from the United States into the region, and from within the western Pacific to Korea itself. Relatively few had been available in Korea at the outset; on 26 January, there were 214 U.S. and South Korean aircraft in Korea, of which 187 were on alert.⁵⁸ But on the 27th, the chief of staff of the Air Force released a flash-precedence operation order for the rapid deployment of elements of nine fighter and interceptor squadrons, along with B-52s and support aircraft (see the table). Supported by sixty-six KC-135 tankers, the tactical units were to arrive in Korea within five

U.S. AIR FORCE DEPLOYED AIRCRAFT

Type	Number
F-105	34
F-102	38
F-4	90
RF-4C	14
F-100	18
B-52	26
EB-66	6

days of receiving orders to move to one of five bases: Kimpo (just northwest of Seoul), Osan, Kunsan, Suwon (south of Seoul), or Kwangju. Twenty-six B-52Ds would then deploy to Guam.⁵⁹ By 7 February, 395 American and South Korean aircraft were in Korea, and 308 of these were combat ready.⁶⁰

As for U.S. ground forces in Korea, planners were immediately concerned about personnel and logistical shortfalls. Because of the demands of the Vietnam War, the two U.S. divisions were at approximately 70 percent of authorized strength.⁶¹ They were now to be reinforced by 8,500 troops.⁶² Even by late February, however, ammunition was available for only forty-five combat days for these two divisions, and eighteen combat days for the South Korean units.⁶³ Eighth Army had on hand 23,300 tons of its war-reserve requirement of 39,400 tons.⁶⁴ A sharp increase in air munitions was also needed. The Joint Staff assessed that Pacific Command’s Air Force component (which had only four thousand tons in Korea) would immediately require 12,700 tons of munitions, and Pacific Fleet naval aviation

(which had 2,800 tons of munitions in Sasebo) needed 11,400 tons. However, over twelve thousand tons of ammunition were en route and would be available to both by 10 February.⁶⁵

As General Bonesteel had foreseen, the vulnerability of sensitive installations proved worrisome both immediately and in the long term. U.S. planners were particularly concerned about the security of the unhardened South Korean airfields, Nike-Hercules surface-to-air missile sites, and nuclear weapons facilities. Several steps were taken to augment the protection of all these sites. By 30 January, the ROK First Army had been directed to provide two infantry battalions for airfield protection, one for Osan and the other for Kunsan.⁶⁶ By 7 February, construction of semipermanent shelters and other forms of physical protection for the Nike-Hercules sites and their missiles was under way.⁶⁷ The Joint Staff recommended that the Defense Department assign additional personnel to provide more security for nuclear weapons sites, and it initiated a longer-term study on physical security improvements to these facilities.⁶⁸

Thus the United States girded for war while seeking to avoid it. The *Pueblo* buildup was costly, particularly because it diverted assets needed in Vietnam. Faced with a hostage situation on a large scale in 1968, decision makers in Washington were generally inclined to diplomacy from the first day of the crisis. Soviet pressure was also a factor; in response to U.S. requests for its “good offices,” Moscow had argued repeatedly that the naval and air buildup was counterproductive. Premier Alexei Kosygin warned President Johnson on 3 February that the buildup only raised tensions and had no chance of resolving the crisis. Johnson responded on 5 February that “on the assumption that . . . we [Washington and Moscow] want peace in that area and that we will both work to that end,” there would be no further air and naval buildup; further, he would order one carrier task group to move “somewhat southward.” Accordingly, the *Enterprise* group sailed through the Tsushima Strait to a point approximately twelve hours’ steaming time from its original position in the Sea of Japan. The national command authorities, however, would not release all naval assets committed to the contingency for several more weeks.⁶⁹

The United States, then, never abandoned the option of force, but the most visible and frenetic military efforts were over. In more ways than were then publicly apparent, the U.S. military had handled a daunting array of planning, deployment, and logistical tasks smoothly and in a remarkably short period. The incident remains painful to recall, even so long after the fact. The material now available, however, makes much clearer how military commanders and national decision makers responded to an unprecedented and challenging situation. Analogous problems would later arise in Tehran and Lebanon, when concern for

American lives and the limitations of military force would compel U.S. leaders to use diplomatic means to free Americans held hostage.

NOTES

1. Trevor Armbrister, *A Matter of Accountability* (New York: Coward-McCann, 1970), is an excellent overview of all facets of the crisis. Informed by over a hundred interviews with participants throughout the chain of command, it is essential reading for students of *Pueblo*. Mitch Lerner's *Mission Impossible: The Pueblo Incident and American Foreign Policy*, to be published in 2001 by the University of Kansas Press, promises to be a worthy successor.
2. *Commander in Chief, U.S. Pacific Command* [hereafter CINCPAC] *Command History, 1968*, vol. 4, pp. 253–4; and *CINCPAC Command History, 1969*, vol. 4, p. 131. Both are at the Naval Historical Center, Washington, D.C. [hereafter NHC].
3. *CINCPAC Command History, 1968*, vol. 4, pp. 253–4.
4. CIA briefing package for high-level *Pueblo* advisory group chaired by former under secretary of state George Ball, 5 February 1968, "*Pueblo Crisis 1968*, vol. 6, Day-by-Day Documents," part 10, boxes 29, 30, National Security Council [hereafter NSC] History—*Pueblo Crisis*, Lyndon Baines Johnson Presidential Library, Austin, Texas [hereafter LBJ].
5. CINCPAC message date-time group 300708Z Jan 68 [30 January 1968, 7:08 A.M. Greenwich Mean Time], Korea—*Pueblo Incident*—Military Cables, vol. 1, boxes 263–264, Korea Country File, National Security File [hereafter NSF], LBJ.
6. CIA *Pueblo* Sitrep [situation report] 14, 14 January 1968, box 257, NSF, Country File Asia and Pacific, LBJ.
7. CIA memorandum, "North Korean Intentions," 23 January 1968, doc. 2488, fiche 220, Declassified Documents Reference System [hereafter DDRS], Research Publications, Woodbridge, Conn., 1998; and CIA/Defense Intelligence Agency/State memorandum, "Reactions to Certain U.S. Activities," 28 January 1968, doc. 2465, fiche 218, DDRS, 1998.
8. See memorandum from T. Hughes (State Department Bureau of Intelligence and Research) to secretary of state, "North Korea's Program for Unification of Korea," 2 February 1968, folder POL 32-4 Kor 1/1/67, box 2266, Record Group [RG] 59, Central Foreign Policy files, 1967–1969, National Archives, College Park, Maryland [hereafter NA], for the best contemporary assessment of trends in North Korean behavior from 1966 to 1968.
9. See response to Senator William Fulbright question number 9, *Pueblo Crisis*, 1968, vol. 10, Fulbright Letter, and appendix entitled "Representative North Korean Statements on Sea Incursions," *Pueblo Crisis*, 1968, vol. 11, Background Documents; both in boxes 31–32, NSC History—*Pueblo Crisis*, LBJ. The *New York Times* editorialized on 27 January 1968 that the official North Korean press had warned the United States that *Pueblo* was about to be seized. Intelligence agencies had assessed that the North Korean "spy boat" reaction in January 1968 was not unusual.
10. Memorandum for W. Rostow from N. Davis, "*Pueblo Incident*," 24 January 1968, box 257, NSF, Country File Asia and Pacific, LBJ; and Armbrister, *A Matter of Accountability*, p. 34.
11. CIA briefing package.
12. Ibid.
13. CIA memorandum, "Confrontation in Korea," 24 January 1968, doc. 2489, fiche 220, DDRS, 1998.
14. Chief of Staff, U.S. Air Force [hereafter CSAF] message date-time group 301416Z Jan 68, Korea—*Pueblo Incident*—Military Cables, vol. 1, boxes 263–264, Korea Country File, NSF, LBJ.
15. N. Katzenbach, memorandum to president, "What We Are Doing about the *Pueblo*," 26 January 1968; and W. Rostow, memorandum to president, 25–31 January 1968, both box 28, NSF, LBJ.

15. CIA Intelligence Information Cable, "Implications of Reported Relocation of USS *Pueblo*," 12 February 1968, doc. 0651, fiche 56, DDRS, 1999.
16. U.S. State Dept., "Chronology of Diplomatic Activity in *Pueblo* Crisis," entry for 29 April 1968, Research Project 924 (formerly classified), October 1968, doc. 2713, fiche 226, DDRS, 1999.
17. CIA memorandum, "North Korea's Foreign Trade," 26 January 1968, DDRS, 1998.
18. "Status of Merchant Shipping in North Korea," 31 January 1968, box 257, NSF, Country File Asia and Pacific, LBJ.
19. CIA, "Confrontation in Korea."
20. U.S. State Dept. memorandum, "Communist Reactions to Various Possible Courses of Action with Respect to North Korea," 26 January 1968, doc. 0906, DDRS, 1999.
21. CIA *Pueblo* Sitrep 14.
22. Commander in Chief, U.S. Pacific Fleet [hereafter CINCPACFLT] message date-time group 012124Z Feb 68, Korea—*Pueblo* Incident—Military Cables, vol. 2, 2/68–3/68, boxes 263–264, Korea Country File, NSF, LBJ; and CIA briefing package, part 11, 8 February 1968, boxes 29–30, NSC History—*Pueblo* Crisis, LBJ.
23. George Christian, memorandum, "Meeting Notes at the State Department on the *Pueblo*," 24 January 1968, box 2, Meeting Notes File, LBJ.
24. "Summary Minutes of *Pueblo* Group," 24 January 1968, doc. 3410, fiche 282, DDRS, 1995; Bromley Smith, memorandum, "Meeting on Korean Crisis without the President," State Department, 24 January 1968, doc. 3411, fiche 282, DDRS, 1995; W. Rostow, "Report on Meeting of Advisory Group, January 29, 1968," 1 February 1968; "Korea *Pueblo* Incident Volume I, Part B," box 257, NSF, Country File Asia and Pacific, LBJ; *Pueblo* meeting agenda prepared by W. Rostow 26 January 1968, LBJ; COMUSK [Commander, U.S. Forces Korea] message date-time group 281214Z Jan 68, file 091 Korea—*Pueblo* 23 January 1968–7 February 1968, vol. 1, box 29, RG 218, Records of U.S. JCS, Records of Chairman (Gen.) Earle Wheeler, 1964–1970, NA [hereafter General Wheeler Records].
25. CINCPACFLT message date-time group 240008Z Jan 68, Korea—*Pueblo* Incident—Military Cables, vol. 1.
26. *Ibid.* The ships were sent to 32°30' north latitude, 127°30' east longitude.
27. ADMIN [i.e., commander not present] CINCPAC message date-time group 230909Z Jan 68, box 257, NSF, Country File Asia and Pacific, LBJ.
28. CINCPACFLT message date-time group 240008Z Jan 68, Korea—*Pueblo* Incident—Military Cables, vol. 1.
29. *Ibid.*; and CINCPACFLT message date-time group 231021Z Jan 68, box 257, NSF, Country File Asia and Pacific, LBJ.
30. CINCPACFLT message date-time group 240008Z Jan 68.
31. *Ibid.*
32. Commander, Seventh Fleet [hereafter COMSEVENTHFLT] message date-time group 231434Z Jan 68, box 257, NSF, Country File Asia and Pacific, LBJ.
33. Commander Task Group 77.5 message date-time group 231520Z Jan 68, as cited in CINCPACFLT message date-time group 240008Z Jan 68 (a chronology of events). The operations were to take place near 35°30' north latitude 131° east longitude.
34. CINCPACFLT message date-time group 231638Z Jan 68, as cited in CINCPACFLT message date-time group 240008Z Jan 68.
35. Telephone conversations cited in CINCPACFLT message date-time group 240008Z Jan 68.
36. ADMIN CINCPAC message date-time group 232227Z Jan 68, "Korea *Pueblo* Incident, Part A," vol. 1, box 257, NSF, Country File Asia and Pacific, LBJ.
37. National Military Command Center [hereafter NMCC] memorandum for the record, "Current Information Concerning USS *Pueblo* Incident," 23 January 1968, box 257, NSF, Country File Asia and Pacific, LBJ.
38. ADMIN CINCPAC 240340Z message date-time group Jan 68, box 257, NSF, Country File Asia and Pacific, LBJ.
39. NMCC memorandum for the record.
40. *Ibid.*; and Commander in Chief, United Nations Command [i.e., in Korea; hereafter CINCUNC] message date-time group

- 070820Z Feb 68, Korea—*Pueblo* Incident—Military Cables, vol. 2, 2/68–3/68, boxes 263–264, Korea Country File, NSF, LBJ. Interestingly, when General Bonesteel advised the South Korean minister of defense that CINCUNC was reviewing its procedures for Defense Condition Three although there were no indications of imminent attack, the minister considered it an overreaction. See CINCUNC message date-time group 231607Z Jan 68, Korea—*Pueblo* Incident—Military Cables, vol. 1, 2/68–3/68, boxes 263–264, Korea Country File, NSF, LBJ.
41. CINCUNC message date-time group 241240Z Jan 68, General Wheeler Records.
 42. U.S. State Dept., “The USS *Pueblo* Incident,” Research Project 939-C (formerly classified), October 1968, doc. 2712, fiche 226, DDRS, 1999.
 43. The enclosures describing this and the other nine options are contained in the file entitled “North Korea—USS *Pueblo* Incident,” box 17, Papers of Clark Clifford, LBJ. Further observations in “North Korean Aggression and the *Pueblo* Incident—Possible Strategies,” 1 March 1968, doc. 3272, fiche 282, DDRS, 1999.
 44. Admiral T. H. Moorer, memorandum to Secretary of the Navy, “Draft Message OPLAN,” General Wheeler Records.
 45. “Action No. 1—Advising Soviets of Actual and Possible Military Moves,” in file “North Korea—USS *Pueblo* Incident,” box 17, Papers of Clark Clifford, LBJ.
 46. W. Rostow, “Report on Meeting of Advisory Group, January 29, 1968.”
 47. *Ibid.*
 48. *Ibid.*
 49. “Notes of the President’s Meeting with the Democratic Congressional Leadership,” 6 February 1968, doc. 569, fiche 48, DDRS, 1990.
 50. CINCPAC message date-time group 310706Z January 1968, General Wheeler Records.
 51. U.S. State Dept., “The USS *Pueblo* Incident.”
 52. COMSEVENTHFLT message date-time group 250332Z Jan 68, box 257, NSF, Country File Asia and Pacific, LBJ.
 53. CINCUNC message date-time group 070820Z Feb 68.
 54. U.S. State Dept. memorandum, “Actions by the United States and Republic of Korea,” 10 April 1968, doc. 2704, fiche 225, DDRS, 1999.
 55. JCS message date-time group 271735Z Jan 68, Korea—*Pueblo* Incident—Military Cables, vol. 1.
 56. CINCPAC message date-time group 251817Z Jan 68, box 263–264, NSF, Country File Korea, LBJ.
 57. CINCPAC message date-time group 300708Z Jan 68, Korea—*Pueblo* Incident—Military Cables, vol. 1.
 58. U.S. State Dept., Korea Task Force, “Situation Report, 1700 Hours EST, January 26, 1968,” LBJ.
 59. CSAF message date-time group 270200Z Jan 68, Korea—*Pueblo* Incident—Military Cables, vol. 1. A table by Walt Rostow entitled “Movement of Combat Aircraft to ‘Korea’ following *Pueblo* Incident,” in memorandum to the president, 25–31 January 1968, contains details of these deployments.
 60. CINCUNC message date-time group 070820Z Feb 68.
 61. CINCUSARPAC [Commander in Chief, U.S. Army Forces Pacific] message date-time group 062348Z Feb 68, General Wheeler Records.
 62. *Ibid.*
 63. Korea Working Group, “North Korean Aggression and the *Pueblo* Incident: Possible Strategies,” doc. 3275, fiche 282, DDRS, 1999.
 64. CINCPAC message date-time group 300708Z Jan 68.
 65. *Ibid.*
 66. *Ibid.*
 67. CINCUNC message date-time group 070820Z Feb 68.
 68. N. Katzenbach, memorandum to president, 7 March 1968, NSF Country File, Asia and Pacific, Container 256, LBJ. The South Koreans were concerned also about force protection; Cyrus Vance, who traveled to South Korea as a “presidential envoy,” would recall, “We often heard them comment on their inability to contain North Korean infiltration teams. The South Koreans are fearful that a North Korean strike/reconnaissance team will destroy some major economic facility, e.g., a refinery or a

- dam." See Vance's memorandum to president, 20 February 1968, doc. 1511, fiche 121, DDRS, 1996.
69. U.S. State Dept. "Chronology of Diplomatic Activity in *Pueblo* Crisis," entry for 5 February quoting State Dept. message date-time group 060003Z Feb 68, and for 6 February, citing State Dept. message date-time group 062010Z February 68.

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THINKING ABOUT INNOVATION

Williamson Murray

Briefings by service representatives at recent conferences on military innovation suggest a great deal about what is wrong with the current efforts in the U.S. Department of Defense to foster innovation. One clearly evoked a mass Stakhanovite-like* operation at that service's doctrine center, a program in which the entire staff, from the commander to the lowliest enlisted person, are working twelve hours a day, six days a week, to realize the service chief's vision of innovation.¹ That is unfortunate; it is inconceivable that any valuable thinking, much less progress toward substantial innovation, could be taking place under such conditions.

It is all too easy, in fact, to form the impression that none of the services are deeply serious about transformation, that little real thinking is occurring within the labyrinthine corridors of the Pentagon or the various agencies that make up the Defense Department's nervous system.² There is a great deal of talk in the Washington, D.C., area about transformation, innovation, and "revolutions in military affairs," but there is unfortunately little focus on the attributes of military (and other) organizations that have actually fostered significant, successful innovation over the past century.

Instead, even the most sympathetic onlooker is likely to sense that the Pentagon lives in a sea of slogans, briefings using elaborate electronic graphics, and a

* The (state-sponsored) Stakhanovite labor movement in the Soviet Union in the 1930s was characterized by centralized organization and very large individual work assignments.

self-satisfied belief that new platforms will solve the tactical and operational problems of the future. Unfortunately, slick presentations do not equate to serious military thought. Nor does the procurement of sophisticated—and therefore exceedingly expensive—weapons systems necessarily lead to a “revolution in military affairs.” In fact, technology has rarely been more than an enabler of revolutions in military affairs in the past, and there is no reason to believe that things will be different in the future.³

From the perspective of a military historian, there is no particular cause for surprise in that state of affairs—or, at least for the coming decade, for worry. What *is* troubling is the set of attitudes and cultures that characterizes U.S. military services at the beginning of what appears to be an extended period of peace. These are attitudes and cultures of a sort that may make real innovation, when it counts, impossible.

Ironically, the United States has been all too successful in its efforts to eliminate the threats that arose in the twentieth century to its national security interests. Entering World War I near the end of the conflict, it helped to bring victory on the Western Front in 1918 and thereby to prevent Kaiser Wilhelm’s Reich from establishing a general hegemony over Europe. Two decades later America’s military and industrial might wrecked both Nazi Germany (with the help of the Soviet Union) and imperial Japan in a successful two-front war.⁴ Then, over the course of a cold war of nearly sixty years (for the Cold War really began in the late 1930s), the United States outlasted its ideologically motivated communist opponents; their economic systems finally collapsed. The difficulty is that the current framework of international politics is unlikely to last until the end of the twenty-first century, and the threats to American interests are likely to grow rather than diminish.⁵

THE HISTORICAL PARAMETERS OF REVOLUTIONS IN MILITARY AFFAIRS

One of the factors that emerged in the last interwar period as a significant enabler of revolutions in military affairs was the fact that military organizations—which then had real, discernible threats against which to develop new capabilities and doctrine—invariably innovated more coherently and effectively than other entities. A case in point is the development of combined-arms tactics by the Germans. The German army spent much of the interwar period confronting threats in both the east and west represented by Polish, Czech, and French military forces.⁶ Mobility and a careful refinement of the lessons of the last war eventually allowed the Germans to handle the immediate threats on their frontiers. However, the development of combined-arms warfare in a Central European setting was not sufficient for the worldwide war that was unleashed; the

Germans possessed neither the logistical or intelligence resources nor the strategic grasp necessary to wage war from the North Cape to the Mediterranean and from Stalingrad to the Caribbean.

Similarly, the U.S. Navy and the U.S. Marine Corps confronted in the 1920s and 1930s formidable problems in developing capabilities to fight a war over

It is all too easy, in fact, to form the impression that none of the services are deeply serious about transformation, that little real thinking is occurring within the Pentagon.

the distances involved in the Pacific Ocean.⁷ For the Navy, the eventual result was the development of carrier aviation in a way that would significantly extend the reach of the fleet.⁸ In the case

of the Marines, the need to capture logistical bases to support the projection of naval and air power across the ocean led to the development of amphibious tactics and capabilities. The Navy, which required island bases to support its own advance across the Pacific, recognized the need to assist the Marines.

The problem that the U.S. services confront today is that they cannot assess when, where, or against whom a future war might occur, or even how long it might last.⁹ There is simply no discernible threat, even on the distant horizon, against which the United States can now measure its forces or its capabilities. The implications are profound, because they make real innovation especially difficult. In the interwar period, those military organizations, like the Royal Air Force and the U.S. Army Air Corps, that developed “generic” capabilities—that is, not focused upon specific projected missions—created doctrinal and operational concepts that were fundamentally flawed. The evidence suggests that ambiguity resulted in dangerous assumptions—for example, about the ability of strategic bomber formations to defend themselves.

But it is not only the uncertainties of the future strategic environment that raise problems for the American military. One of the major advantages that the services enjoyed in the 1920s and 1930s was the fact that that period of peace lasted no longer. Thus, the senior leaders who went to war in 1939 were all experienced combat officers who had studied definable tactical, and in some cases operational, problems on the basis of real-world combat experience. Today’s American military confronts a peace that could last well into the century. The last significant war that the U.S. military fought was the Vietnam conflict; already, few even in the flag and general-officer ranks served in that traumatic war.¹⁰ A long peace, one that lasts forty or fifty years, could well create military cultures that no longer understand the fundamental nature of war, in which planners assume that there will be little friction or that opponents will be unable to interfere with the conduct of operations.¹¹

Certainly, the Royal Navy's history in the period from 1815 through 1914 suggests some of the professional pitfalls of a prolonged period of peace.¹² That military organization, primed by the decades of naval war against the fleets of the French revolutionaries and Napoleon, had come to rely on the willingness and ability of subordinate commanders—exemplified by Admiral Horatio Nelson's "band of brothers"—to discern and respond independently to the dictates of a situation. But in the decades after 1815 the Royal Navy, facing few demands more pressing than polishing brass and making a good impression, gradually changed into a service whose senior officers at Jutland refused to fire on German ships at virtually point-blank range because they had received no orders from their superiors—and neglected to inform those superiors that they had the enemy in sight.

The basic problem is that military organizations can rarely replicate in times of peace the actual conditions of war. It becomes increasingly easy, as the complexities, ambiguities, and frictions of combat recede into the past, for militaries to develop concepts, doctrines, and practices that meet the standards of peacetime efficiency rather than those of wartime effectiveness. There is no other profession in the world whose peacetime efforts represent only a pale shadow of the harsh realities in which its men and women must carry out their true functions—not least that their opponents are trying to kill them. That is why the profession of arms is the most demanding calling not only physically but intellectually. It is also why professional military education has been so profoundly important to armed services in preparing for and waging war. Here lies perhaps the greatest weakness in the current culture of the American military.

With perhaps a single exception, the colleges of professional military education, charged with educating the officer corps for the complexities and ambiguities of the future, are not especially distinguished. In 2000, a very senior officer told an assemblage at a war college that he hoped its students were getting to know their families and playing plenty of softball and golf, as he had himself when he attended that same institution. At least some of the better students were outraged. It is well to remember, as a contrast, that in the interwar period individuals who were to rise to the highest levels in the coming war had been on the *faculties* of the war colleges; examples include Raymond Spruance (who served two tours on the faculty of the Naval War College at Newport and returned after the war to become its president), Richmond Kelly Turner, J. Lawton Collins, W. H. Simpson, and Alexander Patch.

Exacerbating the problem of successful innovation over the past century has been the harsh reality that military organizations have rarely been willing to learn from the past. It is a myth that military organizations tend to do badly in each new war because they have studied too closely the last one; nothing could

be farther from the truth. The fact is that military organizations, for the most part, study what makes them feel comfortable about themselves, not the uncongenial lessons of past conflicts. The result is that more often than not, militaries have to relearn in combat—and usually at a heavy cost—lessons that were readily apparent at the end of the last conflict.

To take an example from the British: by summer of 1918 the Royal Navy had evolved a complex set of technologies and tactics that allowed its antisubmarine

What is troubling is the set of attitudes and cultures—attitudes of a sort that may make real innovation, when it counts, impossible.

forces to respond effectively to the threat of the U-boats. Convoys, air support (including night-flying aircraft equipped with searchlights), trained escort groups, and

technological support had all become available. When the next war began in September 1939, however, the Royal Navy had virtually none of these capabilities. The result was the nightmarish Battle of the Atlantic, wherein the British had to struggle desperately to keep up with a U-boat force that was inflicting terrible losses on the merchant shipping that was the lifeline of their island nation.¹³

We have already noted the flawed concepts and doctrine developed between the wars by the Royal Air Force and the U.S. Army Air Corps. Interestingly, both had rejected the lessons of the last war in their thinking. Yet in retrospect, World War I had clearly underlined two basic facts about air war: first, air superiority is essential to the successful employment of aircraft for any other mission; second, it is very difficult for aircraft to hit targets accurately, even under the conditions of daylight and good weather.¹⁴ In the case of the Royal Air Force, the rejection of recent experience was explicit; for the Army Air Corps, it was implicit.¹⁵ Certainly, the rapidity of technological change confronted airmen with troublesome ambiguities. But the far more impressive level of innovation that the Luftwaffe achieved in preparing for World War II—innovation that rested on a careful analysis of the past—suggests that many of the problems that confronted American and British air forces were self-inflicted, arising from contempt for the lessons of the past (even the immediate past) in a rush to get on with the future.¹⁶

The unwillingness to learn from the past carried on into the next war. The RAF spent much of the first two years of the war killing German cows and blowing up trees, because of its lack of blind-bombing aids. Not until late summer 1941 did the Butt Report make clear that barely one-third of Bomber Command's aircraft were capable of hitting within five miles of their targets (that is, an area of seventy-five square miles).¹⁷ For their part, U.S. airmen dismissed the warnings implicit in the Battle of Britain about the vulnerabilities of bomber formations; it took not one but two Schweinfurt raids and the loss of hundreds

of bombers before Eighth Air Force's leadership gave long-range escort fighters top priority.

There were, however, organizations that did learn from the past. Unfortunately, the foremost of these was the Reichsheer, the successor to the German army of the First World War. The Reichsheer's first chief, General Hans von Seeckt, noted soon after assuming command, "It is absolutely necessary to put the experiences of the war in a broad light and collect this experience while the impressions won on the battlefield are still fresh and a major proportion of the experienced officers are still in leading positions."¹⁸ As one of his first steps Seeckt ordered a sweeping examination of the lessons of the last war, establishing fifty-seven committees to carry out that task. Seeckt gave these committees explicit terms of reference; they were to produce

short concise studies on the newly gained experiences of the war and consider the following points: a) What new situations arose in the war that had not been considered before the war? b) How effective were our prewar views in dealing with the above situations? c) What new guidelines have been developed from the use of new weaponry in the war? d) Which new problems put forward by the war have not yet found a solution?¹⁹

The result was that the Germans developed a thorough understanding of the combined arms-related implications of the war. That historical understanding infused both their 1923 Field Service Regulations and the 1932 basic doctrinal manual *Die Truppenführung*, the finest exposition of the nature of war at the operational level ever written.

It is well worth underscoring the contrast here between the British and German armies: the British failed to establish a committee to study the lessons of World War I until 1932. At that time, the chief of the Imperial General Staff gave it a toughly worded task: the committee was to "study the lessons of the late war, as shown by the various official accounts, and to report whether these lessons are being correctly and adequately applied in our manuals and in our training generally."²⁰ Unfortunately, the committee produced a report that was highly critical of the army's performance in the war, and a new chief of the Imperial General Staff, General Sir Archibald Montgomery-Massingberd, quashed it; he ordered that a far more favorable study be issued to the officer corps. Thus, the British army never gained any insight into what had gone wrong in the last war. Three long years of defeat would ensue before Bernard Law Montgomery assumed command of Eighth Army in Egypt and began to grapple with the systemic prewar problems that still were affecting his command's performance on the field of battle.²¹

There is another crucial element in the innovation equation—the culture of military organizations. By and large, historians devote little attention to the

subject; yet it may be the most important enabler of military innovation. The services that innovated with considerable success in the interwar period possessed internal cultures that encouraged debate, study, and honest experimentation in their preparations for war. Professional military education was clearly a

Professional military education has been profoundly important to armed services in preparing for and waging war. Here lies perhaps the greatest weakness in the current culture of the American military.

part of the process; so was serious study and writing outside of the schoolhouse. Erwin Rommel, the preeminent “muddy-boots” soldier in the German army, not only read books but wrote them.²² Further, military cultures that inno-

vated well cultivated substantive exchanges about the significant military issues of the day. The German army particularly encouraged its officers to engage in serious debate, and in print. In contrast, its future opponent across the Rhine was elevating doctrine to the stature of dogma. In the mid-1930s General Maurice Gamelin, the French army’s commander in chief, established the high command as the sole arbiter for doctrinal matters; all lectures, articles, and books by serving officers had to receive its prior approval. As the French general André Beaufre later noted in his memoirs, “Everyone got the message, and a profound silence reigned until the awakening of May 1940.”²³

Still, history as measure of the parameters of innovation can be quite misleading; the impression historians form can depend on the cases they select and the contemporary sources they consult. The devastating victory of German forces in the campaign against France in 1940 would seem as clear a “revolution in military affairs” as any in the twentieth century. Yet virtually none of the German generals responsible felt there was anything revolutionary in that victory. In fact, one of the most perceptive General Staff officers, General Erich Marcks—soon to be selected by the army’s chief of staff, Franz Halder, to draw up the initial plan for the invasion of the Soviet Union—noted in his diary in late June 1940 as the major explanation of the success in France the ideological motivation of German soldiers.²⁴ On the other side of the hill, however, his counterparts in the British and French armies clearly believed that something revolutionary had occurred.

Why the difference in perception? To German officers the changes that had taken place between 1920 and 1940 appeared to be evolutionary; many of these individuals had been part of the process, step by step. British and French officers, on the other hand, their own armies having evolved at a slower pace or in entirely different directions, saw in 1940 what seemed a victory of revolutionary magnitude.

The only truly sudden, discontinuous change in the interwar period on what would be the Allied side appears to have been the creation of Fighter Command, under the leadership of Air Marshal Sir Hugh Dowding from 1937 through 1940.²⁵ Still, in technological matters Dowding drew on decisions he had made earlier in the thirties, when he had directed the RAF's research and development efforts. In that position he had set the specification for the single-engine, high-performance fighter designs that became the Spitfire and the Hurricane, and he had backed experiments in radio direction finding that would produce radar. Furthermore, the British had created in World War I, by summer 1918, an effective air defense system to oppose German strategic bombers; the concept of a *system* of air defense remained embedded in RAF thinking in the late 1930s and provided a mental framework for creating a counter to the new threats.

PROSPECTS FOR INNOVATION IN THE NEXT CENTURY

What does all this history have to do with the current state of innovation in the U.S. military? In effect, it is a benchmark against which one can measure the trends and the attitudes of its officer corps and senior leadership as to their likely receptiveness to innovation and the major conceptual changes to come in the next decades. In some respects such a report card on the present state of the U.S. military would be quite positive, particularly in regard to current threats. Its marks would not be so good on long-range prospects for innovations on the order of those of the 1920s and thirties.

In the day-to-day business of training and preparing military forces to face current and immediately foreseen threats, the American armed services remain far ahead of any conceivable opponent. Such facilities and programs as "Red Flag," "Top Gun," the National Training Center, and fleet battle experiments all provide realistic, tough challenges for assessing the readiness of units and the suitability of new concepts. While these facilities cannot replicate the conditions of combat, they do provide a framework for preparing for combat in a way that is superior by an order of magnitude to anything available in previous decades. This state of affairs is encouraging, because the historical record suggests that at the heart of innovation lie discrete, specific problems. Only by beginning with such issues have military organizations been able to realize their larger visions and exploit the capabilities inherent in technological change.²⁶

Yet there are also worrisome trends. The military services, with the exception of the Marine Corps, reflect the attitudes of the American people in being profoundly ahistorical.²⁷ The "revolution in military affairs" has been to some extent advocated by people who are disturbingly ignorant of history.²⁸ The

emphasis within the services has been, more often than not, on technology and platforms, as embodying in themselves the necessary direction of innovation. But even more distressing has been the reemergence of the mechanistic, engineering, systems-analysis approach to thinking about future war that so characterized Robert Strange McNamara's Pentagon in the 1960s. The catastrophic result of that secretary of defense's approach was the waging of the Vietnam War by an American military that consistently refused to recognize the human factor in warfare.²⁹

However, most of the lower-ranking and mid-level officers who fought (and survived) in Vietnam returned with the uncertainties and ambiguities of war burned into their souls.³⁰ Accordingly, much of the development of the U.S. military

One of the major advantages that the services enjoyed in the 1920s and 1930s was the fact that the peace lasted no longer.

between 1975 and 1990, as it adapted to an increasing pace of technological change, reflected the lessons learned at such cost in Southeast Asia. It is not that those

seared by the experience of Vietnam rejected technological change; the new weapons systems and technological capabilities introduced in the years of their ascendancy reflect their understanding that technology would provide important leverage against the Soviets. But they also understood that technology was only an enabler: what really mattered in combat, they were convinced, were the doctrine and conceptualizations within which technology was to be employed. One result was a series of doctrinal publications that were the best ever produced by the American military. The 1986 edition of the Army's Field Manual 100-5, as well as the Marine Corps's Fleet Marine Force Manual 1, *Warfighting*, represented a deep understanding of the fundamental nature of war.

Today, that understanding appears in danger of dissipating, notwithstanding the even more Clausewitzian statement issued by the Marines under General Charles C. Krulak. In 1992 the Army published a considerably watered-down version of FM 100-5, and its concurrent efforts to draft a post-Cold War view of the operational level of war floundered in the late 1990s. The 1998 revision of Air Force Manual 1-1 was extraordinarily weak, a jumble of assertions, pictures, and dogma—a manual more concerned with style than substance, a pale shadow of the far more substantive manual published in the early 1990s.

In the larger sense, it is the cultures of the services that constitute the greatest cause for alarm. The American armed services remain alone among "First World" militaries in not making intellectual, along with operational and tactical, accomplishments prerequisites for senior command.³¹ As one senior officer has suggested, American officers with substantial academic attainment have to *prove* that they are "muddy-boots" soldiers or "blue-water" seamen, etc., but the latter do not have to prove they have brains.

Part of the problem is that the service personnel systems are so constrained by laws drawn up in the late 1940s, as well as by more recent service practices and congressional mandates, that it is virtually impossible for young officers to find time and opportunity to attain the broad spectrum of historical knowledge, language training, and cultural awareness that the twenty-first century is going to demand. The officer corps of the U.S. armed services are therefore likely become ever more narrowly technological and less capable of adapting and innovating in the face of diverse threats and emerging challenges.³² For successful innovation in the coming decades, as in the past, it will be the ability to conceptualize that matters.

NOTES

1. This view of innovation contrasted sharply with that of two senior Army officers (who had been leaders in the renaissance of the late 1970s) who suggested in a conference at the Army War College in March 2000 that a crucial element in innovation was to form small, carefully picked groups to work on substantive doctrinal and conceptual issues.
2. For all the talk about how important transformation and innovation are to the future capabilities of the U.S. military, the chief intellectual positions in that process, those of the presidents and commandants of the war and staff colleges, seem often to be filled as afterthoughts—in the case of the National War College, on the basis of which service's turn it is, in the "joint world," to hold that three-star position
3. For a discussion of the role of technology in the processes of innovation and the creation of "revolutions in military affairs," see Barry Watts and Williamson Murray, "Military Innovation in Peacetime," in *Military Innovation in the Interwar Period*, ed. Williamson Murray and Allan R. Millett (New York: Cambridge Univ. Press, 1996).
4. For the role of the United States in World War II, see Williamson Murray and Allan R. Millett, *A War to Be Won: Fighting the Second World War* (Cambridge, Mass.: Belknap Press of Harvard Univ. Press, 2000).
5. See in particular Williamson Murray, "The Emerging Strategic Environment: An Historian's Thoughts," *Strategic Review*, Winter 1999.
6. See Williamson Murray, "Armored Warfare," in Murray and Millett, eds., *Military Innovation in the Interwar Period*, chap. 1.
7. *Ibid.*, chaps. 2 and 10.
8. See in particular Thomas C. Hone, Norman Friedman, and Mark D. Mandeles, *American and British Aircraft Carrier Development* (Annapolis, Md.: Naval Institute Press, 2000).
9. For how well the American military is addressing the emerging threats, see Williamson Murray, "Preparing to Lose the Next War?" *Strategic Review*, Spring 1998.
10. For the impact this is already having on the American military, see Williamson Murray, "Clausewitz Out, Computer In, Military Culture and Technological Hubris," *National Interest*, Summer 1997.
11. As early as spring 1996 this author heard a senior Army general suggest to a war college class that "the digitization of the Army spells the end of Clausewitz."
12. For the deleterious effects of long interwar periods, see Andrew Gordon and John Woodward, *The Rules of the Game: Jutland and British Naval Command* (London: James Murray, 1996).
13. See Murray and Millett, *A War to Be Won*, chap. 10.
14. See Williamson Murray, *The War in the Air, 1914–1945* (London: Cassell, 1999), chap. 1.

15. In 1924 the RAF's air staff produced a memorandum arguing that forces attacking an enemy nation "can either bomb military objectives in populated areas from the beginning of the war, with the objective of obtaining a decision by moral effect which such attacks will produce, and by the dislocation of the country, or, alternatively, they can be used in the first instance to attack enemy aerodromes with the view to gaining some measure of air superiority, and when this has been gained, can be changed over to the direct attack on the nation. The latter alternative is the method which the lessons of military history seem to recommend, but the Air Staff are convinced that the former is the correct one." Public Records Office, AIR 20/40, Air Staff Memorandum 11A, March 1924.
16. For Luftwaffe preparations see Williamson Murray, *Luftwaffe* (Baltimore: Nautical and Aviation, 1985), chap. 1.
17. For the Butt Report see Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive against Germany*, vol. 4, *Appendices* (London: H.M. Stationery Off., 1962), app. 13, p. 205.
18. Quoted in James S. Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence: Univ. Press of Kansas, 1992), p. 37.
19. *Ibid.*
20. Quoted in Harold R. Winton, *To Change an Army: General Sir John Burnett-Stuart and British Armored Doctrine, 1927–1938* (Lawrence: Univ. Press of Kansas, 1988), p. 127.
21. The appalling defeat in the Gazalla battles in May–June 1942 against Rommel underlined these defects clearly.
22. For the best biography of Rommel, as the thinking soldier as well as the man of action, see Sir David Fraser, *Knight's Cross: A Life of Field Marshal Erwin Rommel* (New York: HarperCollins, 1993).
23. André Beaufre, *1940: The Fall of France* (London: Cassell, 1967), pp. 36–7, 45.
24. Marcks commented, "The change in men weighs more heavily than that in technology. The French we met in battle were no longer those of [the years] 14/18. The relationship was like that between the revolutionary armies of 1796 and those of the [First] Coalition—only this time we are the revolutionaries and Sans-Culottes." Quoted in MacGregor Knox, *Common Destiny, Dictatorship, Foreign Policy, and War in Fascist Italy and Nazi Germany* (Cambridge, U.K.: Cambridge Univ. Press, 2000), p. 186.
25. See Alan Beyerchen, "From Radio to Radar: Interwar Military Adaptation to Technologic Change in Germany, the United Kingdom, and the United States," in Murray and Millett, eds., *Military Innovation in the Interwar Period*, chap. 7. For Dowding's prewar view of the threat, see Sir Hugh Dowding, "Employment of Fighter Command in Home Defence," intro. and annotations by John Monsarrat and Robert S. Staley II, *Naval War College Review*, Spring 1992, pp. 35–50.
26. I am indebted to Colonel Rick Sinnreich, USA (Ret.), for this point.
27. See MacGregor Knox and Williamson Murray, *The Dynamics of Military Revolution, 1300–2050* (forthcoming from Cambridge Univ. Press, 2001).
28. See William A. Owens and Edward Offley, *Lifting the Fog of War* (New York: Farrar, Straus, Giroux, 2000), pp. 73–9, 102–15, for astonishing misstatements of historical fact—including the first names of generals.
29. The best critique of the American conduct of the war remains Andrew Krepinevich, *The Army and Vietnam* (Baltimore: Johns Hopkins Univ. Press, 1986).
30. See Murray, "Clausewitz Out, Computer In."
31. On professional military education see Leonard Holder [Lt. Gen., USA (Ret.)] and Williamson Murray, "Prospects for Military Education," *Joint Forces Quarterly*, Spring 1998.
32. This trend increasingly affected the General Staff in the late nineteenth and early twentieth centuries and caused the Germans significant difficulties in the first years of World War I.



Looking toward Luce Hall from the Mahan Rotunda

IN MY VIEW

THE HARVARD BOYS DO RUSSIA

Sir:

I can't believe that the Naval War College actually gave Harvard's Jeffrey Sachs space in your publication ["The Geography of Economic Development," *Naval War College Review*, Autumn 2000, pp. 93–106]. Where are your heads? You should have published Anne Williamson's or Janine Waddell's articles on Sachs, Summers, Hays, Rubin, and the rest of Harvard's one-world crowd. You need to get hold of Waddell's article "The Harvard Boys Do Russia" in the *Nation*—not exactly a right-wing tome—and also Anne Williamson's excellent testimony before Congress on Harvard University and their part in the rise of the Russian oligarchy.

A George Washington University expert on the Soviet economy, Dr. Waddell has stated that "Harvard professor Jeffrey Sachs and other Western economists participated in meetings . . . to promote a plan of 'shock therapy,' eliminate price controls, subsidies[,] . . . [but produced] instead hyperinflation that hit 2,500 percent." One of the results was that investment capital evaporated, as did the savings of the Russian people. As a result, Professor Sachs suggested that Western aid in the form of money allocated by Congress should be offered in order to stabilize the Russian economy.

It was in an alliance with Anatoly Chubais and the Harvard Institute for International Development—including Sachs, Andrei Schliefer, David Lipton, and Jonathan Hay—that the current Russian monstrosity began to take shape. With the unequivocal support offered by former Harvard professor (now president) Lawrence Summers, the monster had the form of capitalism without the basics necessary for democracy and a free market.

Jonathan Hay's influence on the development of the Russian economy began during the George H. W. Bush administration. He received a grant from USAID to help form a new free-market Russian economy. In this effort the Harvard

Institute raked in \$57.7 million to aid in establishing a “new” Russian economy. But what developed instead was a creature without direction or a hope of success.

The Harvard coterie—including Sachs—encouraged Chubais’s deceit and pilfering of massive amounts of Western aid. They did this by circumventing various Russian agencies and the Duma, standing by while Chubais used a form of “executive order,” or presidential decree, to get around the Russian governing bodies. To the delight of the American experts involved in economic policy decisions, Russian economic policy setters took a page from the Clinton administration. This “stroke of a pen, law of the land”—a fatal and corrupt blend of American policy generated by its “experts”—did nothing to establish even the barest form of free-market capitalism in Russia.

Loans were granted with less than sensible oversight, as billions of U.S. and foreign dollars went to what Dr. Waddell calls “tycoon capitalism.” After 1991 approximately \$3.65 billion had been given to Russia in the effort to develop a free market economy. In 1996, the IMF, backed by the United States, gave another \$10.2 billion. In July of 1998 Russia received \$11.2 billion, with more to follow. According to Waddell and Anne Williamson, Venyamin Sokolov, head of the Russian equivalent of the U.S. General Accounting Office, has stated: “All loans made to Russia go to speculative financial markets and have no effect whatsoever on the national economy. And it is the Russian people who are responsible for repaying these loans.” Again, as in other cases of economic interference by large financial institutions, U.S. government experts, and really short-sighted economic policy, the average Russian is very little better off than before.

Dr. Frankenstein, as embodied by the Harvard experts, has merely allowed the enrichment of the experts and a slide toward economic and political chaos in greater Russia.

The bright spots in Russian-American economic cooperation have come from the private sector. Dr. Tucker Hart Adams, president and CEO of the Adams Group in Denver and head of the American-Russian Collaborative Enterprise, has a long history of economic relations with the Russians. However, her experience is not with the Chubais crowd or the Harvard experts; it is with the new class of entrepreneurs in Russia who are involved in the “economy off the books.” She maintains that a significant middle class is growing in Russia. While oligarchs grow rich and a significant number of Russians are impoverished, a multipart economy has developed. The old state sector still exists, with several layers, along with the new, mostly off-the-books, economy. With respect to American expert help, she states, “Most of our foreign aid went to American accounting firms and consulting groups, not to Russian businesses. Russia desperately needs foreign capital.” She insists that Russians are investing in Russia but that

because of the onerous tax structure, businessmen route profits to offshore entities, which then return them to Russia as foreign investment. Some Russians are merely investing through an offshore back door.

In an exclusive interview, Dr. Adams stated, “We assumed that things like basic honesty in business transactions with strangers, respect for law, seeing others’ success as validation that you too can succeed, are human nature. They aren’t. I’ve learned over the past ten years, ‘Give me liberty or give me death’ is part of our American culture. The average Russian just scratches his head if you talk about that.”

To give Sachs space in your publication, aside from his free speech rights, shows a want of understanding; I wonder what is up with your editors. Sachs is the last one who should be designing our globalist future.

So seek the services of Anne Williamson or Janine Waddell or Jude Wanniski (a former Reagan advisor), who have a better grasp on the way of the world and the direction it is headed.

DIANE ALDEN

Holly Springs, Mississippi

Alexander S. Cochran is currently a visiting professor at the National War College. From 1998 through 2000, Dr. Cochran held the Major General Matthew C. Horner Chair of Military Theory at Marine Corps University. From 1990 to 1998, he was a professor of military history at the Air War College and was awarded the status of professor emeritus. Prior to that he served with the U.S. Army Center for Military History and taught at the University of Notre Dame. Dr. Cochran received his Ph.D. from the University of Kansas. He has published several books and numerous articles about World War II, the Vietnam War, and the Persian Gulf War. He is a graduate of the U.S. Army Command and Staff College and the Air War College, and he served active-duty tours in Vietnam and Europe.

REVIEW ESSAY

OFFICIAL HISTORY, NOT “INSTANT ANALYSIS”

Alexander S. Cochran

Marolda, Edward J., and Robert J. Schneller, Jr. *Shield and Sword: The United States Navy and the Persian Gulf War*. Annapolis, Md.: Naval Institute Press, 2001. 544pp. \$36.95

Over the past decade, there has been an unfortunate trend in the publications by service historical offices—a rush to historical judgment that rivals CNN’s insistence on, and the public’s appetite for, “instant analysis.” The Persian Gulf War has been subjected to this with such books as Air Force historian Richard Hallion’s unofficial *Storm over Iraq* and Army general Robert H. Scales’s *Certain Victory*. At best, these “instant histories” are self-serving (with Quadrennial Defense Review overtones); at worst, they are flawed by their single-service focus. Lest the U.S. Navy feel free of this, Norman Friedman’s *Desert Victory*, published within months of the conflict’s termination, led the parade.

Fortunately for all, Dr. Dean C. Allard and Dr. William S. Dudley, successive directors of the Naval Historical Center, eschewed this approach, opting for time to ensure detached analysis, adequate documentation, and historical perspective. Their wise decision has been richly rewarded by this book, the work of two of the Center’s historians, Edward Marolda and Robert Schneller, Jr. In the tradition of the official histories of World War II, which allowed a “decent interval” before writing, *Shield and Sword* will be the starting place for all who are interested in the U.S. Navy’s role in the Gulf conflict.

The U.S. Navy’s role in the Persian Gulf (renamed the “Arabian Gulf” by U.S. spokespersons during the war) over the past fifty years eclipsed those of the other services in both time and function. (For a wide-angle view, see Michael Palmer’s *Guardians of the Gulf: A History of America’s Expanding Role in the*

Persian Gulf, 1833–1992. Palmer, now a historian at East Carolina University, had earlier worked at the Naval Historical Center.) Although the modern U.S. military first entered the Gulf during World War II, in conjunction with Lend-Lease arrangements to assist the Soviet Union, American military presence there after 1945 rested solely upon the presence of a few U.S. Navy ships. The Middle East Force, established in 1948 and for decades comprising a small seaplane tender as flagship and usually a pair of destroyers rotating into the Persian Gulf assignment, was the sole visible agent of American policy.

Seaborne command and control capabilities remained throughout the Cold War—indeed it was these platforms that provided the initial base when the Tampa, Florida, headquarters of Central Command was projected forward in the fall of 1990. Two carriers, a battleship, and their escorts had surged into the area after the invasion of Kuwait, and the maritime prepositioning ships began to arrive at al-Jubayl to equip two Marine expeditionary brigades on 15 August 1990. Then, during DESERT SHIELD, the U.S. Navy led the coalition in enforcement of economic sanctions—an essential backdrop to U.S. maneuvering for world backing as well as to UN nonmilitary alternatives. For offensive DESERT STORM planning, aircraft from the three carriers of Battle Force Yankee in the Red Sea and the three carriers of Battle Force Zulu in the Gulf, and Tomahawk cruise missiles fired from battleships, cruisers, destroyers, and submarines, formed collectively a critical part of the air campaign. Once the air and ground wars were launched in early 1991, naval contributions more than adequately met expectations. Equally important were naval presence in the Gulf and Arabian Sea, and maritime support to the final ground operations. Overlooked by much of the public and news organizations throughout both DESERT SHIELD and DESERT STORM was the sea lift that provided the critical logistical support. While some writers are quick to note that 90 percent of the personnel who moved in and out of theater were transported by aircraft, far more important were the equal percentages of vastly greater tonnages of equipment and supplies that moved over sea-lanes secured by the U.S. Navy.

Marolda and Schneller handle these myriad elements of the Navy “Gulf War story” in superb fashion. One has grown to expect such scholarly thoroughness and professional detachment from Dr. Marolda, a longtime member of the Naval Historical Center, author or editor of five official histories about the Navy in Vietnam, and currently the Center’s senior historian. Coauthor Dr. Robert J. Schneller, Jr., has been with the Center since 1991. Their book’s four-page acknowledgment section is essentially a list of names of key participants and other researchers; Marolda and Schneller are good historians.

Focusing on the theater level in general, and on its naval component specifically, *Shield and Sword* argues a clear thesis: the Persian Gulf War was an

enormously complex undertaking, and the U.S. Navy contributed to every aspect, from diplomacy and sanctions to combat and logistics. To highlight specific contributions, the authors have organized their book in both functional and chronological fashion. The opening chapter deals with Cold War presence in the Gulf and on the early buildup phases after the Iraqi invasion of Kuwait. The second and third chapters focus upon Operation DESERT SHIELD, and the fourth, fifth, and sixth discuss DESERT STORM. The seventh chapter examines postwar events, such as mineclearing, redeployment of forces and equipment, Operation PROVIDE COMFORT, the homecoming receptions, maritime interception and sanctions enforcement operations, the establishment and conduct of no-fly zones north of the thirty-sixth parallel and south of the thirty-second, and punitive Tomahawk strikes through 1993. Chapter 8 is a thirty-page summary, concluding with the 1995 establishment of the U.S. Fifth Fleet.

While their emphasis is upon U.S. Navy and Marine planning and operations, Marolda and Schneller have done a masterful job of integrating not only the Army and Air Force aspects of the war but also maritime contributions by several members of the coalition. They have moved beyond other official service histories, demonstrating sensitivity to mutually supporting functions and capabilities. Further, by waiting for the publication of earlier official histories, they were able to mine their sources and integrate their interpretations.

The text is complemented by fourteen maps and six tables, as well as a judicious collection of photographs and artwork—almost all of it by the Navy's leading combat artist, John Charles Roach—providing a visual portrayal of the varied naval contributions to the war. Such an approach suggests new directions for future official histories, as an increasing number of readers will come from a background of MTV. One cannot review these photographs without being conscious of the cultural and gender mix of today's deployed naval forces.

Marolda and Schneller's bibliography reveals an extensive list of primary sources—documents and oral histories accumulated during the Naval Historical Center's research effort. Just as impressive is the authors' list of secondary sources. Anyone who has attempted to survey the massive amount of published material on the Gulf War will welcome their brief annotations on each entry.

To be sure, there were glitches in the U.S. Navy's performance. To mention a few, lack of mine-warfare resources, as well as outdated doctrine, proved embarrassing. Traditional U.S. naval testiness at tight command and control procedures ran counter to Central Command's demands at both the joint and combined levels. Also, the Navy's tradition of rotating commanders of units and organizations led to at least one difficult episode—during the relief of Vice Admiral Henry H. Mauz by Vice Admiral Stanley Arthur as commander of the Seventh Fleet and Naval Forces, Central Command, late in the planning phase.

Dissemination of intelligence, particularly satellite imagery, to forces afloat was abysmal due to the ships' lack of communications and processing capability, as well as to bureaucratic problems due to "an Army general and an Army J-2 [intelligence staff head] fighting an Army war." Service rivalries affected air operations as well, particularly with the notorious air tasking order and the Air Force control of the joint force air component commander role, although Battle Force Yankee and Battle Force Zulu had different levels of friction with Air Force practices. Likewise, the Navy's insistence on holding back air assets from the overall campaign for carrier protection took its toll on joint and combined relationships. The authors explain these issues, and others, in light of the Cold War focus upon the Soviet Union and its navy.

The Persian Gulf War may have been the last conflict of the Cold War. Others, however, have suggested that it was the first of the post-Cold War period. Professional officers concerned about insights with future implications would do well to dwell upon the concluding chapter, blandly entitled "Summary." Here Marolda and Schneller highlight major insights, yet in the manner of consummate historians, laying out past issues without presuming future solutions. Even the busiest naval professional should find an hour to read this chapter of *Shield and Sword*.

In sum, *Shield and Sword* is first-rate history—solid in research, comprehensive in coverage, and insightful in analysis. It will be useful to academic and serving professionals alike. Those who wish to research and write in greater depth on specifics of the U.S. Navy in the Gulf War must begin with this book. More importantly, as the authors conclude, "the Gulf War stimulated the U.S. Navy to make the transition . . . from the Cold War to a new era of regional conflict." If they are correct, every professional naval officer, and all others who expect to command, employ, or work with U.S. naval forces in the future, also need to start here.

BOOK REVIEWS

PARALLEL THINKING

Hore, Peter, ed. *The Genesis of Naval Thinking since the End of the Cold War*. Maritime Strategic Studies Institute Paper 2, March 1999. 109pp.

Over the past decade, the U.S. Navy has undergone a profound shift in its strategy and thinking. This collection of thoughtful essays written by senior Royal Navy officers between 1992 and 1998 makes it clear that soul-searching by naval thinkers has not been confined to the United States. Eric Grove's foreword, tracing the evolution of British naval thought over this period, and Captain Edwin Atkinson's essay, "The Influence of Sea Power upon Peace," demonstrate how closely the thinking, assessments, and recommendations being made in the United Kingdom paralleled those made in the U.S. Navy's ". . . From the Sea" process. It is certainly an interesting commentary on the eternal verities of naval thinking that what Grove calls an "intellectual revolution" occurred without any formal exchange between these two very different groups, each of which was engaged in an "in house" effort. The real value of these essays, however, lies not in the history of post-Cold War naval thought but in what they say about a continuing revolution in naval thinking on both sides of the Atlantic—especially the efforts to stretch declining force levels to deal with extended commitments. A

particularly salient essay in this regard is Vice Admiral Alan West's "1919–1991: The Need for a United Kingdom Grand Strategy." West's forthright analysis of Britain's failed attempt to adapt to a new strategic environment after World War I points to the lack of a coherent national "grand" strategy, to destructive interservice rivalries, and to military planning driven by costs alone. The lack of a grand strategy in particular left Britain unable to make any meaningful trade-off between the limited means accorded the military in the interwar years and the far-reaching commitments that British forces were directed to meet. Compounding the problem was the policy makers' assumption that Britain "will not be engaged in any great war during the next ten years," a fiscally convenient dictum that persisted well into the 1930s despite evidence to the contrary and that ultimately left Britain unprepared for war. All of this should have a familiar ring to today's readers. Indeed, it is the currency of these problems that gives this essay its greatest impact.

Of equal, if different, significance is a series of essays by Brigadier Robert Fry,

Vice Admiral J. J. Blackham, and Admiral Sir Peter Abbott, written between 1995 and 1998. These provide perceptive British insights on the changing maritime dimension of our post-Cold War world and the increased roles for maneuvers and forward presence in shaping a new strategic environment. These are exactly the kinds of issues with which the U.S. armed forces are now struggling.

The essays' chief drawbacks are their brevity and what they do not say. The in-



Berkowitz, Bruce D., and Allan E. Goodman. *Best Truth: Intelligence in the Information Age*. New Haven, Conn.: Yale Univ. Press, 2000. 203pp. \$22.50

The U.S. intelligence community, as it currently exists, is fundamentally flawed and must be remade. With this opening premise, Bruce Berkowitz, a senior consultant at RAND Corporation, and Allan Goodman, former dean of the Georgetown University School of Foreign

Service, present their blueprint for the future of American intelligence.

According to the authors, a trio of factors threatens to leave the intelligence community ineffective and irrelevant. First, it is no revelation that the end of the Cold War has left the intelligence commu-

nity without a single clear threat as a focus for its analytic efforts. The past emphasis on the Soviet Union offered intelligence analysts historical continuity. Change tended to be evolutionary; for example, one generation of Soviet submarines offered insights into the next. Today, however, nations and nonstate actors have unprecedented access to technology and information and with it a new capability to organize and operate rapidly across borders. These developments create the prospect of an "instantaneous threat" against the United States from entirely unexpected sources.

Second, if Carl von Clausewitz was correct in defining intelligence as "every sort of information about the enemy and his country," fundamental changes in information management must create fundamental changes in intelligence. Berkowitz and Goodman observe that the intelligence community was created on an

A book reviewer occupies a position of special responsibility and trust. He is to summarize, set in context, describe strengths, and point out weaknesses. As a surrogate for us all, he assumes a heavy obligation which it is his duty to discharge with reason and consistency.

ADMIRAL H. G. RICKOVER

sights presented are clearly worthwhile and for that very reason deserve expansion. For example, what were the working-level debates that undergirded the flag officers' presentations? The fact that the essays cover the seven-year period up to only three years ago would indicate that the issues raised with regard to the changing role of naval forces in the new century are still as far from being fully resolved in the Royal Navy as they are in the U.S. naval service. This suggests room for both an equivalent American publication and another Maritime Strategic Studies Institute paper, as both navies continue the process of rethinking naval power that collectively began in 1991.

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industrial model designed for the efficient production of standardized products. But today, consumers receive customized, on-demand information from their stockbrokers, news services, and on-line retailers; they expect nothing less from their intelligence suppliers. Further, intelligence products have become just one of the numerous data streams used by decision makers—and not necessarily the most important one. Americans are increasingly skeptical of “received wisdom” from authority (institutional or individual) and will “channel surf” for the intelligence support they expect.

Finally, the authors discuss the challenges posed by changes in American political attitudes toward intelligence. Where Americans once allowed intelligence agencies to be accountable to but a handful of elected officials, today they increasingly expect much more transparency to the public. Further, political realities suggest that for the foreseeable future intelligence agencies will receive no additional funding.

The likely bureaucratic answer to these challenges is to reorganize, seek efficiencies, and work more closely with the customer. However, the authors believe that seeking greater efficiency within the current intelligence model is not an effective answer. While they give the intelligence community high marks for satisfying identified customer requirements, they believe that today’s world of “instantaneous threats” and operations other than war makes it impossible for most customers to identify intelligence requirements early enough to permit the intelligence bureaucracy to respond. Simply put, today’s structure is a recipe for always being a step behind.

The solution proposed in *Best Truth* is a transition to what Berkowitz and Goodman dub an “adaptable intelligence organization.” Ad hoc groups would address specific customer problems. Expanded use of contractors or part-time employees with specialized skills would provide expertise for unanticipated threats. Further, the authors suggest the establishment of what they call a “virtual economy” to fund the intelligence community. Major intelligence consumers would control funding dedicated to their intelligence requirements and would have the option of spending it on any intelligence organization or discipline they believe could satisfy their needs. Intelligence agencies would cease to have “lanes in the road”; any agency could propose a solution to a customer problem. One intended effect of this virtual economy would be to force government agencies out of tasks that can be performed more efficiently by the private sector. Intelligence organizations would focus on emerging technologies not yet profitable for private industry, and on unique, high-risk espionage operations that only government organs can perform.

The bottom line of this work—a design for the future U.S. intelligence community—is not particularly satisfying. The broad outline presented leaves the reader looking for more—more specifics, more examples, more justifications. In its defense, however, the book is offered as a “manifesto” and not an exhaustive study. Its value lies in the clear and insightful statement of the challenges facing the intelligence community and the questions that they raise. Although it falls short of what its title promises, *Best Truth* is thought-provoking reading for intelligence professionals and naval officers

who are interested in the challenges of the information age.

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Peters, Ralph. *Fighting for the Future: Will America Triumph?* Mechanicsburg, Penna.: Stackpole Books, 1999. 210pp. \$19.95

The introductory pages of this book are suffused with a disagreeable arrogance and condescension. Speaking of the U.S. Army in which he spent his career, Ralph Peters states that he is “loyal to it still, much as one might care for an old lover felled by drink and bad decisions.” With a metaphorical sad shake of the head but his face set nobly toward a higher truth, he sets out on a twelve-essay description of his vision of the future and the blindness of today’s military leaders. This reviewer was quite prepared for an annoying slog through a tententious book.

Yet *Fighting for the Future* turned out to be a provocative, if strident, collection of essays (published separately between 1994 and 1999). Although Peters’s intellectual arrogance does not lessen throughout, he offers many cogent arguments and observations on a variety of themes that ought not to be dismissed out of hand, even if some ultimately are not persuasive. They directly address core issues underlying many of the most difficult problems facing today’s civilian and military leadership.

Peters depicts a dark and violent future. In the opening essay, “The Culture of Future Conflict,” he argues that “future wars and violent conflicts will be shaped by the inabilities [*sic*] of governments to function as effective systems of resource distribution and control, and by the

failure of entire cultures to compete in the postmodern age. . . . Basic resources will prove inadequate for populations exploding beyond natural limits. . . . There will be fewer classic wars but more violence. . . . Intercultural struggles, with their unbridled savagery, are the great nightmare of the next century.”

The post–Cold War U.S. military is singularly unprepared to deal with this future. Politicians and military leaders alike fundamentally misunderstand this brave new world. As a result, we will “face a dangerous temptation to seek purely technological responses to behavioral challenges” and will “need to struggle against our American tendency to focus on hardware and bean counting to attack the more difficult and subtle problems posed by human behavior and regional history.” The forces we are buying today at exorbitant cost may prove unusable against actual future threats. Peters argues that against a broad range of emerging threats, new rules of engagement rather than new weapons are needed, since no nation or other entity can face us head to head in conventional terms. “We are constrained by a past century’s model of what armies do, what police do, and what governments legally can do. Our opponents have none of this baggage.”

One essay takes issue with the notion of a technologically based revolution in military affairs (RMA). Though to a degree he argues against straw men, Peters’s main point is that technological issues are secondary to understanding the human nature of future foes—no argument there. On the other hand, in another essay he claims that “current and impending technologies could permit us to reinvent warfare,” allowing us to attack instigators of violence rather than their populations. Ironically, two other essays

deal with future urban combat and armored warfare in futuristic terms that some leading RMA proponents would endorse gladly.

The essay “A Revolution in Military Ethics?” is perhaps the best in the book. It is a hard-nosed look at “ethics” as a crutch: “Ethics in war on the part of a Western society do not so much protect the objects of our violence as they shield us from the verity of our actions.” Peters argues that current Western “ethics” have separated combatants from directly seeing the consequences of their actions, in essence “dehumanizing” warfare through stand-off precision. There are other perverse “ethics.” We are unwilling to assassinate Saddam, but we are willing to strangle the Iraqi population in vain hopes of undoing him. “We might discover that our current military ethics are the least humane thing about us.”

Peters makes a compelling argument that Americans are psychologically unprepared to understand the nature of their future foes. The United States will face implacable forces in nationalism and fundamentalism. Americans cannot imagine the level of brutality required to deal with “warriors,” as opposed to soldiers. Peters’s warriors are “erratic primitives of shifting allegiance, habituated to violence, with no stake in civil order,” and their defeat will require a toughness and seriousness of purpose that may be inconsistent with the moral values for which we claim to fight. Part of the problem is a feckless multicultural relativism. “What of all that self-hobbling rhetoric about the moral equivalency of all cultures? Isn’t it possible that a culture (or religion or form of government) that provides a functional combination of individual and collective security with personal liberties really does deserve to be

taken more seriously than and emulated above a culture that glorifies corruption, persecutes nonbelievers, lets gunmen rule, and enslaves women? Is all human life truly sacred, no matter what crimes the individual or his collective may commit?” Unless the United States stops fooling itself about the nature of its foes, it risks defeat, or at best military ineffectiveness.

Fighting for the Future, for all its provocative arguments and pithy language, sometimes borders on the apocalyptic. Its culminating essay is positively messianic. Peters argues for a “Strategic Enforcement Initiative” to assure American global dominance. “The goal, initially, is not to interfere in the affairs of foreign states, as long as they behave humanely toward their populations. The first . . . step is to force an end to interstate warfare. We alone will have the wealth and power to do it—plus, we could collect defense taxes from states that benefit from our actions. As the world’s only extant empire of law and justice, we also have the right and responsibility to do it. We need have no moral reservations about outlawing aggression and then enforcing that prohibition.” In short, the United States should “dominate the earth for the good of humankind.” Notwithstanding the fun of making French (and Chinese) readers hyperventilate, advocating aggression in pursuit of a “higher good” is unacceptable; the world has had enough recent experience with utopianism. Peters might better have reserved this essay for his novels.

For all its stridency, however, *Fighting for the Future* offers thought-provoking arguments and is well worth reading. If Peters is too convinced he knows the future, that is still a lesser sin than smug,

Luddite, self-assurance that tomorrow will look just like today.

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Osiel, Mark J. *Obeying Orders: Atrocity, Military Discipline & the Law of War*. New Brunswick, N.J.: Transaction, 1999. 398pp. \$39.95

It is a fundamental belief of thoughtful military personnel that what they do, even in the heat of battle, remains a moral enterprise. This important and careful volume critically assesses an important legal pillar of that belief: that moral soldiers are to obey only *lawful orders*. It is often said that soldiers are expected to disobey unlawful orders, especially those ordering atrocities or violations of the laws of war. Since Nuremberg, it is held that “superior orders” do not constitute a defense against charges of war crimes. Osiel makes it abundantly clear that these nostrums are far from certain or legally reliable as presently understood.

Mark J. Osiel is a professor of law at the University of Iowa and the author of *Mass Atrocity: Collective Memory and the Law* (Transaction, 1999). He knows whereof he speaks: he has interviewed extensively the perpetrators and the victims of Argentina’s “dirty war,” and his grasp of the relevant literature (legal, philosophical, and military) on the subject of obedience is capacious.

With care and precision, the author challenges the present standard, which requires soldiers to disobey orders that are “manifestly” illegal. This standard, he argues, is fraught with unclarity and is far too permissive of illegal acts in war.

The book is much more than a dry legal treatise about a point of law. Osiel writes with real passion and breadth. He includes important chapters on the psychology of small military units and the requisites for their cohesion and combat effectiveness. He is careful throughout to acknowledge the limitations of law as a constraint on combat behavior. He argues with zeal for the legal and practical possibility of doing better than the present legal standard in encouraging moral responsibility in officers and soldiers. In the end, Osiel transcends the genre of legal analysis entirely, grounding his ethical appeal in the very nature and basis of the military profession itself. He is Aristotelian when he closely links moral conduct in war with the virtues that define excellence in the profession of arms itself.

In addition, Osiel is helpful in a practical sense. He suggests how best to use Judge Advocate General advisers on military staffs, and he offers concrete examples of subordinates who, faced with unclear orders (deliberate or otherwise), managed by means of requests for clarification to avoid committing war crimes.

Osiel dissects the various ways in which atrocities are committed: “(1) by stimulating violent passions among the troops (‘from below’); (2) through organized, directed campaigns of terror (‘from above’); (3) by tacit connivance between higher and lower echelons, each with its own motives; and (4) by brutalization of subordinates to foster their aggressiveness in combat.” Since the causes are diverse, each type will require its own unique approach to control it; but Osiel’s overall point is profound: “The evidence examined here suggests that effective prohibitions against atrocity depend much less on the foreseeability to soldiers of criminal prosecution after the fact

than on the way soldiers are organized before and during combat.” In other words, *post-facto* law enforcement is only one tool, and not a powerful one at that, in the struggle to prevent atrocities and war crimes.

It is this breadth of treatment that lifts Osiel’s discussion far above stereotypical legal analysis and makes it a truly significant contribution to the literature of military professionalism and military ethics. *Obeying Orders* connects the moral argument deeply to the professional commitments of soldiering. Members of the military profession should be encouraged to exercise their ethical judgment over as wide a scope as possible within the functional requirements of military effectiveness and efficiency.

It would be a shame and a mistake if only military and civilian lawyers chose to read this profound meditation on the moral foundations of soldiering itself. Informed by military practicality, and respectful of the possibilities of deepening and widening the highest senses of military professionalism, *Obeying Orders* is the first book on professional ethics that a seasoned officer ought to read.

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Smith, George W. *The Siege at Hue*. Boulder, Colo.: Lynne Rienner, 1999. 195pp. \$49.95

George W. Smith has provided an excellent historical summary of the battle of Hue, based on his personal experience as an information officer assigned to the 1st Division of the Army of the Republic of (South) Vietnam (ARVN), and on after-action reports, articles, and

interviews. The book highlights the complexities and dynamics of conducting military operations in urban terrain, particularly in a combat environment.

Hue had been the imperial capital of Vietnam, and it was the country’s cultural and intellectual center. It was South Vietnam’s third-largest city, strategically located in the country’s narrowest part, near the coast. One of the few cities where until 1968 there had been no U.S. combat presence, it was virtually undefended and consequently a lucrative target for the North Vietnamese army and the Viet Cong.

The battle of Hue was the largest single engagement of the Vietnam War. It lasted from 31 January to 25 February 1968 and (not counting civilian deaths) claimed 5,713 casualties on both sides. Smith describes the battle as a classic joint and combined operation. The city was divided into two areas of responsibility, with the South Vietnamese army assigned the mission of retaking the northern portion and the U.S. Marines that of regaining control south of the Perfume River.

The urban conditions in Hue were comparable to those of Dodge City in the American “Old West.” Some buildings had wooden fronts, porches, and sidewalks; the streets were narrow, and buildings were densely concentrated. In the middle of Hue, however, was a virtually impregnable fortress known as the Citadel, with towers, ramparts, moats, concrete walls, and bunkers. The walls were twenty-six feet high and in some sections forty feet thick. The moat was ninety feet wide at many points and up to twelve feet deep. The Imperial Palace, another enclave within Hue, was surrounded by a twenty-foot wall.

Smith identifies three costly errors made by the North Vietnamese and Viet Cong on the first day of their attack. First, they failed to overrun the 1st ARVN Division headquarters. Second, they failed to assault the U.S. Military Assistance Command Vietnam (MACV) compound. They had sufficient forces to accomplish both missions. Third, they failed to destroy the An Cuu Bridge, south of the city, leaving open a route by which the Marines could reinforce and resupply the MACV compound. The bridge was destroyed five days later by enemy sappers, but too late. These errors most likely prevented the enemy from holding Hue for longer than they did.

The value of this book lies in the lessons learned by the forces fighting in Hue. The first lesson was the value of accurate intelligence. At the operational level, the allies falsely believed that the massive buildup of enemy troops around Khe Sanh near the Demilitarized Zone meant that the enemy did not have enough manpower for a countrywide offensive. At the tactical level, commanders routinely made decisions in the absence of any specific intelligence about enemy strength or dispositions in Hue. The importance of intelligence is best illustrated by the events on the night of 16 February. The enemy suffered a tremendous setback when, on the basis of an intercepted radio message, allied artillery destroyed a battalion-sized force trying to infiltrate through a gate on the southwestern wall. The second lesson involved the use of air and artillery fire support. These supporting arms greatly facilitate fire and maneuver in any environment, especially in cities; however, authorization for their use in cities is normally restricted by rules of engagement in order to limit collateral damage, and Hue was no

exception. Unfortunately, the buildings were fortresses, with interlocking lines of fire from roofs, attics, and windows. The South Vietnamese government eventually lifted all restrictions on the use of heavy weapons south of the Perfume River. However, another limitation on heavy firepower is weather. Naval gunfire, eight-inch howitzer fire, and tactical aircraft support were frequently not readily available because of poor conditions.

The third lesson is the complexity of house-to-house fighting. Heavy weapons, such as tanks, 106 mm recoilless rifles, mortars, and 3.5-inch bazookas, were used in Hue for street fighting. Objectives could be reached only by going through buildings. The Marines dug holes in walls through which they rushed, clearing the rooms on the other side and establishing sniper positions in preparation to take the next buildings. Streets could be crossed only under a barrage of covering fire. Mortars provided local indirect fire support that could be used in lieu of larger weapons that were either unauthorized or unavailable. Mortars helped reduce the personnel-for-building casualty ratio. The enemy forces in Hue were well dug in, well supplied, and prepared in some cases to fight to the finish. None of the Marines had had any training in street fighting prior to Hue.

Today's efforts by the Joint Staff to develop urban-combat doctrine and by the Marine Corps and Army to produce tactics, techniques, and procedures are meant to ensure that the United States does not face the same dilemma in the future. Seventy-five percent of the world's population now resides in cities. This will equate to eight to ten billion people by the year 2025. The U.S. military used to fight *for* cities; now it is required to fight *in* them—cities similar to

Hue. George W. Smith offers a very good perspective on what such street fighting is all about.

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Shultz, Richard H., Jr. *The Secret War against Hanoi: Kennedy's and Johnson's Use of Spies, Saboteurs, and Covert Warriors in North Vietnam*. New York: HarperCollins, 1999. 408pp. \$27.50

At its core, this is a remarkably well told story of failure—heartbreaking failure to be sure, and failure despite the heroic efforts of some remarkable men to achieve success, but still failure. The U.S. covert war against Hanoi was, as this book makes clear, patently unsuccessful. That it could have been otherwise makes the story all the more compelling.

A leading expert on low-intensity conflict and covert warfare, Shultz has filled a gap that has troubled those who for decades have been trying to understand the Vietnam War. Using meticulously documented research, and writing in a reader-friendly style, Shultz lays out the history of the U.S. Military Assistance Command Vietnam Studies and Observations Group (usually referred to simply as “SOG”) from 1964 to 1972. Such a book is arguably long overdue, but classification of material and the lack of documented interviews with former SOG members crippled previous attempts. At worst, the operations of SOG have suffered gross distortions, turning one of the war’s most interesting features into farce and pulp fiction. Happily, this is no longer the case. Now, using newly declassified documents, Shultz lays to rest many of the myths—including the now-infamous

CNN claim that Operation TAILWIND involved killing U.S. deserters and the use of the nerve agent Sarin.

Shultz begins his tale by explaining how an aggressive Kennedy administration, angered and humiliated by the Bay of Pigs, formally placed CIA-controlled covert operations against North Vietnam under military leadership. President Kennedy, his brother Robert, and other key advisors wanted immediate results, and they ignored the fact that a covert operation takes time to achieve its desired effect. Nor was the military high command ecstatic about gaining this new responsibility. A generic aversion to special operations, fear of where Kennedy might be taking the Army, and distrust of many involved in Special Operations, resulted in a bureaucratic struggle of rare intensity and duration. One of the tragic ironies emerging from Shultz’s research is that from the beginning, senior U.S. military and political leaders effectively prevented SOG, which was charged with the new covert mission, from achieving its full potential.

Thus, the cards were stacked against SOG from the start. One obstacle was an administration that, following President Kennedy’s assassination, seemed hesitant to take advantage of apparent opportunities. Nor did SOG ever receive proper support from the military or CIA leadership. Opposition from senior members of the State Department was at times ferocious. In addition, SOG’s South Vietnamese counterpart was never fully trusted, possibly with good reason. As a result SOG rarely had the right mandate or qualified people, operated under byzantine restrictions, and never achieved a rapport with the one organization that could have dramatically increased its effectiveness. Shultz also

points out that from time to time SOG created its own problems. There was concern over discipline and, more problematic, security vulnerabilities of which the group seemed unaware.

Nonetheless, SOG managed to carve out a role for itself, eventually running four major types of operations against the forces of the Democratic Republic of Vietnam: cross-border commando operations in Laos and Cambodia, aimed at observing and interdicting the Ho Chi Minh Trail; insertion of South Vietnamese agents into North Vietnam to carry out resistance operations and deception; maritime interdiction and commando operations against the North Vietnamese coastline; and psychological warfare operations aimed at North Vietnam. While some of these, such as the insertion of agents into the North, were carried out only by Vietnamese personnel, others, such as actions against the Ho Chi Minh Trail, also involved Americans. Shultz extensively covers these operations, and the reader cannot help but be impressed by the courage of those who carried them out. However, because these efforts were never integrated into the overall strategic plan (if ever such a plan truly existed), the results were less effective than they might have been. Yet despite it all, SOG came close enough to offer a tantalizing vision of what could have been done. This is one of the most depressing and intriguing aspects of the entire book.

If Washington and Saigon did not take SOG's efforts seriously enough, the same cannot be said of Hanoi. The North was extremely sensitive to SOG's actions and worked hard to counter them. In this the North Vietnamese were remarkably successful. If the United States did not get covert operations right, the North Vietnamese certainly got counter-covert

operations right. The book explores the Vietnamese actions in some detail, much of it for the first time. This facet of the book makes fascinating reading.

For students of U.S. national security decision making, this book is a superb case study. Shultz not only discusses the operations of USMACVSOG but examines and describes how these issues were handled in the Pentagon and the White House. Furthermore, he does not limit his examination to the actions of cabinet members, military commanders, or key presidential advisors but sheds light on organizational structures, procedures, and lower-ranking action officers. This aspect of the process is all too often overlooked.

There are many familiar names to be found here. These include such Special Forces legends as Dick Meadows, who was to be responsible for advance ground reconnaissance during the failed Iranian hostage rescue attempt; and Colonel "Bull" Simmons, who led the brilliantly executed but unproductive prisoner-rescue raid against the Son Tay prison. Secretary of Defense Robert McNamara and General William C. Westmoreland both have their say, as do the general's Navy and Marine Corps counterparts. Some readers might feel that presenting these disparate viewpoints is enough, but given the failure of SOG to live up to its potential and its losses in lives and treasure, reasoned judgments of responsibility and accountability should be made. Shultz does not shirk from this task, and his conclusions are convincing.

Richard Shultz wraps up with a masterful summation and analysis of the longest U.S. covert campaign in wartime. He also provides a brief overview of the status of the Special Operations community today. In doing so he poses

interesting questions for covert operations of the future.

If this were all *The Secret War against Hanoi* accomplished, it would be a significant contribution to our understanding of the Vietnam conflict, thereby earning a place on our bookshelves. But Shultz has also performed a long overdue and badly needed service in recognizing the tremendous human cost associated with SOG's operations. The casualty figures are simply staggering. For example, of approximately five hundred agents placed in North Vietnam, apparently all were killed or captured; some were "doubled." Only slightly less appalling are the casualty rates suffered by the U.S.-led reconnaissance teams that operated against the Ho Chi Minh Trail. The worst year was 1969, in which counter-trail operations in Laos experienced a 50 percent casualty rate. It is only fitting that the danger these soldiers faced and the sacrifices they made be part of the public record of the Vietnam War.

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Bradley, James, with Ron Powers. *Flags of Our Fathers*. New York: Bantam, 2000. 353pp. \$24.95

On the northern perimeter of the Arlington National Cemetery, clearly visible from the adjacent highway, stands a huge bronze monument embodying perhaps the world's most famous war photograph: the flag-raising on Mount Suribachi during the seizure of Iwo Jima in February 1945. *Flags of Our Fathers*, told by the son of one of the men represented by the figures, is an intensely personal history surrounding this event, a riveting story guaranteed to evoke emotion in any reader interested in what

Tom Brokaw has called "the greatest generation."

Although Bradley is neither a strategist nor a military historian, he understands the significance of Iwo Jima and places it properly in the context of World War II. This is not revisionist historiography. Bradley solidly affirms Truman's decision to drop the atomic bomb to save American—and Japanese—lives, because the alternative would have been even more horrific. The author's depiction of the training regimen, camaraderie, and exploits of the U.S. Marine Corps will make all Marines proud. However, he is not so kind to other services, often portraying them as weak willed, unprofessional, even incompetent.

James Bradley is the son of John "Doc" Bradley, a Navy corpsman who joined five Marine brothers-in-arms during the Herculean struggle to wrest "Sulfur Island" from the Japanese. In the course of the battle, these six members of "Easy" Company were memorialized for raising the American flag, an image captured by Joe Rosenthal's Pulitzer Prize-winning photograph. Three of the six never returned home—a testimony to the overall casualty rate of 84 percent for E Company in the thirty-six day conquest of an island a third the size of Manhattan.

The complete story of the flag raising was never told, because the principals considered the photograph insignificant when compared to the sacrifice of those who did not return. Like many of their fellow veterans, the three survivors adamantly refused to discuss the details of their war experiences, even keeping secret their awards for heroism under fire. Following his father's death in 1994, Bradley interviewed the friends and loved ones of all the men to tell the "real story" behind the photograph.

The author delights in the pure integrity and patriotism of his protagonists. Nonetheless, Bradley's anecdotal evidence makes a strong case that the principal source of battlefield bravery has little to do with national allegiance—it's your buddies who count. He wrestles with the term "heroes"—a title of honor strenuously rejected by all the flag raisers. There is little doubt, however, where the author places these men who stood atop Suribachi, beneath their flag.

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Jablonsky, David, ed. *Roots of Strategy*, Book 4 (Four Military Classics). Mechanicsburg, Penna.: Stackpole Books, 1999. 533pp. \$19.95

In this useful fourth installment of Stackpole's "Roots of Strategy" series, David Jablonsky of the Army War College presents substantial selections from four classics of strategy: *The Influence of Sea Power upon History*, by Alfred Thayer Mahan; *Some Principles of Maritime Strategy*, by Julian S. Corbett; *The Command of the Air*, by Giulio Douhet; and *Winged Defense*, by William Mitchell. The editor provocatively pairs American authors with non-Americans writing on the same subjects and bonds them with two unifying arguments. Jablonsky contends that all four writers were coping with monumental technological changes in warfare and were struggling to reconcile continuity with change, while peering into the future.

The two naval theorists, Mahan of the United States and Corbett of Great Britain, sought inspiration and guidance for future warfare in the putatively unchanging principles of the age of sail. The airpower innovators, Brigadier General

Mitchell of the U.S. Army and Brigadier General Douhet of Italy, concluded that the heavy bomber rendered the study of past warfare antiquarian and irrelevant to those planning for future combat.

As an American born in 1879 (one year before Douglas MacArthur and eleven years before the "closing of the frontier"), "Billy" Mitchell remained convinced that the vastness of the Atlantic and Pacific Oceans gave the United States a security from land invasion unique among great powers. In the editor's opinion, Mitchell consequently was slow to confront Douhet's truly horrifying prescription for mass bombing of cities to pulverize "the material and moral resources of a people" in order to achieve "the final collapse of all social organization." For most of his contentious career, Mitchell envisioned large land-based American bombers primarily as instruments for sinking enemy warships advancing toward the American coastline, with fighter aircraft indispensable for downing long-range bombers headed for inland U.S. cities, which were now "as subject to attack as those along the coast."

Defense also plays a large role in Sir Julian Corbett's 1911 masterwork, *Some Principles of Maritime Strategy*, the distillation of a lifetime of careful reflection upon the age of fighting sail from Drake to Nelson. A lawyer by training and a minor novelist by avocation, Corbett is the only author in this volume who never served in the military. He was, however, an intimate of Admiral Sir John Fisher, who presided over the dawn of the age of the dreadnought.

Some Principles of Maritime Strategy shows a linguist's familiarity with the figure considered today the Zeus of strategic thinkers, Carl von Clausewitz. It contains the best short summary of Clausewitz's

principal ideas currently in print in the United States. Equally riveting to anyone formulating realistic strategy is Corbett's disenchantment with supposedly "decisive" grand battles, his concept of geographically shifting and limited command of the seas, and his praise for interservice cooperation and amphibious operations. He was the first English-speaking writer indissolubly to link the military-naval, diplomatic, and economic elements of strategy.

As Jablonsky notes, Captain A. T. Mahan's scope is narrower than Corbett's. The American naval officer was writing in 1890 to further the technological and strategic revolution unleashed by the recent advent of the steam-driven, heavily gunned, thickly armored battleship. Jablonsky reprints only the first sections of Mahan's opus, those in which Mahan makes his "political-economic argument for sea power." The editor has omitted entirely the great bulk of the book, the thirteen historical chapters concerning both grand strategy and "the art and science of command," as derived from Anglo-French naval battles in the age of square-rigged ships of the line. This is a regrettable exclusion, because Jablonsky has adopted and emphasized the imaginative thesis of Jon Tetsuro Sumida that Mahan was as interested in "teaching command" as in the strategy of sea power. The limited excerpt from *The Influence of Sea Power* is insufficient to permit the reader to judge the validity of Sumida's proposition or to assess the utility of Mahan's ponderous dissections of sea battles, which were fought with a technology that had already disappeared when the naval officer wrote more than a century ago. Half a loaf is nonetheless better than none, and Jablonsky's balanced arrangement of Corbett, Douhet, and Mitchell

alongside Mahan should earn this volume a place on the bookshelves of all students of strategy who are sated with the current deification of Clausewitz and Sun Tzu.

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Smith, Gene A. *Thomas ap Catesby Jones: Commodore of Manifest Destiny*. Annapolis, Md.: Naval Institute Press, 2000. 223pp. \$34.95

Thomas ap Catesby Jones is best known for his mistaken seizure of Monterey, California, on 20 October 1842, believing that the United States and Mexico had gone to war. The occupation lasted barely overnight before the American flag had to be ceremoniously lowered and the Mexican flag rehoisted. Locally, the event was an occasion for many banquets and dances, but on the national level more serious repercussions caused a crisis in relations between Mexico and the United States.

Living in Monterey, I had often wondered about this incident, which is mentioned only briefly as a footnote in local histories. Now, with this biography of Thomas ap Catesby Jones, I have a much better understanding of a colorful part of Monterey history.

But this book offers much more. It explores the life of a controversial and complicated man whose naval career lasted half a century, from 1805 to 1855. In this period the United States went through a transformation from a young coastal nation on the Atlantic seaboard to a power that spanned the continent, a nation pursuing a "Manifest Destiny," with interests stretching well beyond its borders.

While Jones made no truly significant, long-lasting contribution to the U.S. Navy, his career personified the times. He was a contemporary of better-known Isaac Hull, Oliver Hazard Perry, Matthew F. Maury, and John Dahlgren, and like them he contributed to the evolution of the American navy. He was a hero of the War of 1812, introduced innovations as an inspector and superintendent of ordnance, carried the Stars and Stripes to Hawaii in the 1820s, and helped to incorporate California into the United States. Yet Jones was not an atypical commander of his day; he was a striking personality in an age in which individual temperaments helped shape the Navy.

Gene A. Smith does a masterful job in chronicling the life of Thomas ap Catesby Jones, from his appointment as a midshipman in 1805 to his court-martial in 1850 on charges that included fraud against the United States, libel, neglect of duty, and oppression. The court found him guilty and suspended him for five years. Today's standards for court-martial were not applied to the Jones case; it is doubtful that due process and rules of evidence were followed. Attitudes about naval discipline were changing, but unfortunately, Jones had not changed with them. He was probably convicted because of his past behavior as an old-fashioned tyrant, making him a useful example with which to enforce new attitudes concerning shipboard discipline. Richard Henry Dana's *Two Years before the Mast* and Herman Melville's *Moby Dick*, among others, had so changed public perception that attitudes such as those of Jones were no longer acceptable. In a sense, one might liken the 1840s and 1850s to the 1980s and 1990s, where attitudes of acceptable behavior changed, and those who did not change along with them

eventually paid the consequences. The earlier era dealt with naval disciplinary methods such as flogging, while the more recent attitude change concerned male behavior and sexual harassment.

Although the book is well researched and documented, it may be somewhat difficult to follow for those unfamiliar with the geography. For example, the actions of Jones in the War of 1812 and around New Orleans and the Hawaiian Islands in the 1820s would have been easier to follow if maps had been provided. I could easily follow the discussion concerning Monterey and California only because I live there.

Beyond the life of Jones, the book describes well the mores, attitudes, and practices of the era. For example, career patterns of naval officers; the relationship between private, financial, and military affairs; ambivalence toward slavery; the chaos created by the California gold rush; and many other apparently disconnected topics are presented in a natural and informative manner.

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Padfield, Peter. *Maritime Supremacy and the Opening of the Western Mind: Naval Campaigns That Shaped the Modern World, 1588–1782*. New York: Overlook Press, 2000. 340pp. \$35

“Maritime supremacy is the key which unlocks most, if not all, large questions of modern history, certainly the puzzle of how and why we—the Western democracies—are as we are. We are the heirs of maritime supremacy.” So begins the argument of naval historian Peter Padfield’s latest work. Like Nelson, Padfield is prone to bold acts, and in this

case, it is his thesis. Beginning with a look at the Spanish Armada of 1588, Padfield leads the reader through several pivotal naval battles, including The Downs (1639), Beachy Head (1690), Quiberon Bay (1759), and the American Revolution's naval campaigns. He contends that these battles not only were critical from a tactical or strategic standpoint but played a long-term role in the development and political, economic, and social lives of the countries involved. Put simply, maritime power and success lead to such liberty as has been enjoyed by the Western democracies over the recent centuries. "Our faith in democracy, personal freedoms and human 'rights,' and other comforting prescriptions of the humanist liberal credo, stem from the supremacy of maritime over territorial power."

Drawing primarily upon published materials, the author builds a strong argument for the relationship between naval and maritime power and the success of such liberal democratic states as the Dutch United Provinces, England, and the United States.

The success of these maritime nations was and is based on the principles so well outlined by Alfred Thayer Mahan. Control of the sea is a two-stage issue—control of trade, and naval protection of that trade. Padfield reminds the reader that during the period of royal absolutism only a state with a strong merchant class could be a true maritime power, and only a strong merchant class could enable a kingdom or state to finance and operate successfully naval fleets—"by far the greatest industrial-bureaucratic organizations of the time." The result of the merchant influence was a decline in royal prerogative. Fleets cost money, and the merchants had the money; as a result,

merchants gained an increasing role in official decision-making circles. Along with the rise of the merchant class in the early modern states came a rise in the belief of political and social freedoms. According to Padfield, "Liberty has always been the pride and rallying cry of powers enjoying maritime supremacy."

Beginning with the United Provinces, Padfield contends that their maritime power, along with their fairly urban nature, created "the first mass market in intellectual and artistic properties." Padfield states further that in essence the seventeenth-century Dutch burghers "produced a prototype of late-twentieth-century Western civilization." In short, the Dutch were the "harbingers of the modern West." With the "Glorious Revolution" of 1688, the mantle of maritime greatness passed to England.

These are strong assertions. However, as Padfield outlines it in *Maritime Supremacy*, his thesis that maritime supremacy and the "opening of the western mind" are inseparably linked is convincing.

If there is a shortcoming to *Maritime Supremacy*, it is in the naval history used to illustrate Padfield's points. Although his descriptions of these famous naval engagements are interesting, there is entirely too much detail. This section of the work could be an entire book by itself, without the discussion of Western freedoms and democracy. The naval battles within the work represent simply the author's canvas, whereas his focal point is the thesis concerning the relationship between maritime power and the development of the liberal democratic state. This reviewer's suggestion is to ignore the battle minutiae and enjoy the argument. With its brief glossary of nautical terminology, bibliography of the leading secondary literature concerning the subject,

and decent annotation, this work will make a welcome addition to the library of the naval specialist, professor, and armchair admiral alike.

Today's naval powers operate in a global theater. Padfield's research not only demonstrates the origins of this global maritime arena but reinforces the importance of maintaining a nation's maritime heritage, diversity, and power. The book's dust jacket calls the United States of America the "ultimate successor" to this maritime past. If the United States is to maintain the position Padfield claims its maritime history has granted it, then its naval leadership—if not its citizenry—should be reading this work, to understand the past and prepare for the future.

ANDREW G. WILSON
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Gibson, Andrew, and Arthur Donovan. *The Abandoned Ocean: A History of United States Maritime Policy*. Columbia: Univ. of South Carolina Press, 2000. 362pp. \$39.95

The Abandoned Ocean has been published at an opportune time in the history of the U.S. merchant marine. The latter half of the twentieth century has seen the flags of the traditional maritime nations of Europe and the United States almost disappear from the sea. The fleets of developed nations operated under national regulation. Competing with shipping lines under foreign registry that paid minimal registry fees in lieu of national taxes, employed cheaper crews, and obtained and maintained their ships at fluctuating world market prices rather than in conformance to engineering and safety standards, the merchant fleets of developed nations were increasingly at a

disadvantage. When the Western European shipping lines found they were unable to operate their vessels under existing national regulations, many legislatures eased those standards by allowing the formation of international registries that established conditions similar to those of their competitors. Some countries, such as France and Great Britain, established ship registries in their colonies that provided similar competitive conditions.

The Abandoned Ocean is a historical study of American shipping policy over the past two hundred years. It was drafted in the hope that it would help future maritime policy makers to understand better the competitive environment that exists today.

As might be expected, given the academic background of its authors, the book will be equally valuable to students of maritime affairs. It is a case study of the strategic, economic, and political issues that have influenced American policy makers at the highest level from the colonial period. Readers are provided with the essential facts about what has, and what has not, been beneficial to U.S. maritime industry. They may draw their own conclusions.

The book is divided into three parts. The first, "Free Trade and American Enterprise," addresses the years 1600 to 1914, the period of the greatest growth of the American merchant marine, and of its steep decline following the Civil War. The second part, "War-Impelled Industries," guides the reader from 1914 to 1960, discussing the issues that gave rise to the great merchant fleets of both world wars, and the New Deal legislation culminating in the Merchant Marine Act of 1936. The third part, "The Approaching

End,” covering 1960 to 1990, will be of greatest interest to the serious student.

The senior author, Andrew Gibson, sailed as master of a Liberty ship in World War II and rose in the maritime industry to become the senior vice president of the Grace Line and president of the Delta Line. In government, he served as administrator of the U.S. Maritime Administration and assistant secretary of commerce. Gibson held the Emory S. Land Chair of Merchant Marine Affairs at the Naval War College, in Newport, Rhode Island, and he continues there as an Advanced Research Fellow.

Arthur Donovan is a teacher of maritime history at the U.S. Merchant Marine Academy in Kings Point, New York. He has been published widely on the history of science and technology.

The authors contend that present American maritime policy was designed to solve specific problems. The policy, beneficial at the time it was implemented, has since been manipulated in a contest between shippers, shipowners, shipbuilders, and representatives of labor to the detriment of the whole. As a consequence, the industry does not speak with one voice; it rarely has been able to agree upon a common policy, because proponents and opposition groups exist in the executive

branch and in both houses of Congress. All are influenced by an extensive group of lobbyists and trade associations operating in the interests of their respective constituencies.

The authors conclude: “In all maritime nations except the United States it is accepted that the sole purpose of a merchant ship is to make a reasonable net return on invested capital. In the United States political considerations tend to dominate because there are many beneficiaries other than investors. The government is compelled to continue payments to make sure that the expectations of these many other recipients are satisfied. . . . Anyone familiar with America’s proud record of maritime preeminence must be saddened by this prospect of final decline. . . . But in the absence of a truly new departure, of strong leadership and collective commitment to fundamental renovation, extinction is the most likely outcome.”

The Abandoned Ocean should be read by those who wish to comprehend the issues facing U.S. maritime policy makers in the restructuring of an American merchant marine for the twenty-first century.

ROBERT K. REILLY
Naval War College



The Mahan Rotunda

RECENT BOOKS

Reynolds, Clark G. *Navies in History*. Annapolis, Md.: Naval Institute Press, 1998. 267pp. \$35

Experienced writers know all too well that a short work about a big subject is much harder and more demanding to write than a long one. On the basis of more than forty years of study and writing about naval history, Clark Reynolds has written a very short book that traces four thousand years of naval history on all the oceans of the world. It is a remarkable achievement. Reynolds conceived this book as a “primer” and a “reconnaissance” for readers new to the field of naval history.

With ancient history summarized in a dozen pages, the American Civil War in fifteen, and World War II in thirty-four, the book is clearly designed to communicate with an American audience that ranges in age from teenagers and seaman apprentices to newly recruited officer candidates and congressmen from landlocked states. In this practical day and age, readers of this journal will find Reynolds’s volume particularly useful as something to recommend to beleaguered souls who need to know something about

naval history but can only accept it spoon-fed and in as few words as possible. In this book, Reynolds has made an admirable effort to reach them.

For those with more time for study and reflection, Reynolds’s little book is an updated synopsis of what he has written elsewhere. Serious students of naval history will benefit more from considering Reynolds’s detailed arguments. These may be found in *Command of the Sea: The History and Strategy of Maritime Empires* and in a volume of collected essays, *History and the Sea: Essays on Maritime Strategies*.



Tsouras, Peter G., ed. *The Greenhill Dictionary of Military Quotations*. Mechanicsburg, Penna.: Stackpole Books, 2000. 574 pp. \$75

“It is a good thing for an uneducated man to read books of quotations” (Winston Churchill, under “Quotations and Maxims,” page 395). Lieutenant Colonel Tsouras, USAR (Ret.), hopes it will also be good for “the aspiring soldier, as well as the military professional and

enthusiast.” Indeed, Tsouras relates how General James Wolfe in 1758, having adroitly driven the French before Louisburg into their defenses, was exasperated that “our friends here are astonished at what I have done because they have read nothing”; Wolfe had found his maneuver in Xenophon. With this book Tsouras (a senior analyst at the U.S. Army National Ground Intelligence Center and the author of three books on World War II and the American Civil War) updates his *Warriors’ Words*, adding 2,400 quotations (for a new total of 5,943), as well as indices (now three) and categories (now 485).



Pitch, Anthony S. *The Burning of Washington: The British Invasion of 1814*. Annapolis, Md.: Naval Institute Press, 1998. 298pp. \$32.95

Anthony Pitch has written a flowing, vivid description of the events surrounding the British assault on Washington in the final stages of the War of 1812. Residents of the Washington, D.C., area will particularly enjoy Pitch’s evocative account of those times, making associations with local landmarks as they follow the British march in Maryland from Benedict to Nottingham and on to Upper Marlboro, Woodyard, Bladensburg, and the District of Columbia. As Pitch demonstrates, it was an exciting, if ignominious, moment in American history, but one offset by the events that followed shortly thereafter at Baltimore’s Fort McHenry. Pitch’s lively style is buttressed by his assiduous historical research in twenty archival collections in the United States, where he paid particular attention to

finding new and previously unused personal accounts.

Marley, David F. *Wars of the Americas*:



A Chronology of Armed Conflict in the New World, 1492 to the Present. Santa Barbara, Calif.: ABC-CLIO, 1998. 722pp. \$99

In this handsomely produced reference work, David F. Marley (who has also produced other works for the same publisher) has taken an unusual “slice” through history: all the conflicts not of an era but of the Western Hemisphere. The unfamiliarity of this perspective for North American readers is brought home by the fact that the section covering the American Civil War is (if the longest) only one entry of eighty-six. The sections comprise brief overviews followed by subentries under variously specific dates (“LATE 1639. A slave revolt erupts around Mount Misery . . .”). The sections in turn are grouped chronologically by era, the first covering the discovery and conquest by the Europeans (who, as the preface notes, found the hemisphere “already embroiled in warfare”).

The book is uniquely valuable as a source on events that many of its users might otherwise find difficult to research. Moreover, readers for whom, say, the War of the Cakes (1838–9) is obscure may learn for the first time in consulting *Wars of the Americas* how great was the price paid on all sides for the European settlement of Latin America and for the liberation and consolidation of the nations that grew up there.

Index, list of sources for further reading, maps, and numerous period works of art.



Thomas, David A. *Battles and Honours of the Royal Navy*. Conshohocken, Penna.: Combined Publishers, 1998. 326pp. \$46.95.

This very useful reference (in effect an updating of *A Companion to the Royal Navy*, Harrap, 1988) is advisedly titled—that is, it aims at a comprehensive listing of the Royal Navy’s *battles*, not just its formal battle honors, as acknowledged by the Admiralty. All the “honours” are here, even some fought before the navy became officially “royal” in 1660, as well as a few apparent (to the author) errors. However, RN battle honors are defined in ways that exclude a number of actions that have been important to the service or to the course of history. For instance, they are given only for Royal Navy victories, “well fought” draws, or glorious (if unsuccessful) defiances of “overwhelming odds”; also, while some single-ship and even boat actions are included, others are not, and the opponent must have been another vessel. As the author points out in his introduction, the loss in December 1941 of Force Z (HMS *Prince of Wales* and *Repulse*) is disqualified on both of these counts, and yet it was a crucial event for the Pacific War and the history of naval warfare.

Accordingly, to this book of alphabetized battle synopses (with personalia, forces, and brief narrations) Thomas has added whole chapters of engagements not accorded honors but that are of historical significance, as well as actions not properly “battles”—such as the Dunkirk evacuation and the (German) “Channel dash.” He has also chosen single representative examples of categories whose instances are too

numerous to list (the patrol of the submarine *E-11* in June 1915). There are also sections on single-ship and boat actions, the Fleet Air Arm, and the Royal Marines.

David A. Thomas, who served in the Royal Navy in World War II, is the author of some sixteen books of naval and social history. Illustrations, index, and selected bibliography.



Boatner, Mark M., III. *The Biographical Dictionary of World War II*. Novato, Calif.: Presidio, 1996, repr. 1999. 733pp. \$24.95

Mark Boatner, a graduate of and former history professor at the U.S. Military Academy, is the author of two earlier references, *The Civil War Dictionary* and *Encyclopedia of the American Revolution*. The present work is aimed primarily at professional (that is, noncasual) users—especially researchers, but also editors, librarians, teachers, and students. (The issuance of this paperback reprint makes clear how valuable such readers found the original book.) The main section comprises entries of various lengths (by Boatner, many vetted by specialists) on a thousand individuals about whom the target readers are likely to need information; the entries cross-reference to a supporting glossary of specialized terms, and to a bibliography.

How did he pick the thousand names his serious users would wish to find?—largely by a “semantic count,” that is, of “hits” in the indexes of standard and specialized histories. To the resulting list, pared down to a manageable length, he added names from

slighted categories (notably Soviet and German commanders) as well as a number urged by specialist consultants.



Chambers, John Whiteclay, II, ed. in chief. *The Oxford Companion to American Military History*. New York: Oxford Univ. Press, 1999. 916pp. \$60

The value of an “Oxford Companion” reference can be essentially taken for granted, and its self-description can be accepted at face value: “Drawing on the most current scholarship in the field and in a number of cases advancing that scholarship, *The Oxford Companion to American Military History* provides a comprehensive, one-volume guide to the study of war, peace, and the military throughout American history.” Its entries (over a thousand) are distributed among the categories of “Historical Action and Events,” “The Armed Services,” “Weaponry and Material,” “State and Society” (including rebellions and civil-military relations), “Law and Ethics,” “Dissent” (including conscientious objection, antiwar movements and protests), “Popular Culture and the Military” (with references to film, music, even oratory and fashion), and biographies. Dr. Chambers, of Rutgers University, has been assisted by a panel of advisers (the likes of James McPherson), four editors (Fred Anderson, Lynn Eden, Joseph T. Glatthaar, and Ronald H. Spector), a consulting editor (G. Kurt Piehler), and some five hundred contributors (many of them distinguished, even famous) from a wide variety of disciplines. Maps, tables, index.



Morris, James M., and Patricia M. Kearns, comps. *Historical Dictionary of the United States Navy*. Lanham, Md.: Scarecrow Press, 1998. 405pp. \$85

The bulk of this look-up work, number 4 of Jon Woronoff’s “Historical Dictionaries of War, Revolution, and Civil Unrest” series, is a reference for U.S. Navy ship types and classes, and individual ships “that played an important role”; aircraft and airship types; major weapons; secretaries of the Navy, chiefs of naval operations, and other individuals with “particularly important roles”; and significant battles—all covering the entire history of the service. The entries are brief but supported by cross-references, an extensive bibliography, glossaries of abbreviations and ship designations, a chronology, and a brief overview of U.S. naval history. Dr. Morris, professor of history at Christopher Newport University, is the author of several books on U.S. military history; Ms. Kearns is head of bibliographic control at the Earl Gregg Swem Library at the College of William and Mary.



Lewis, James A. *Neptune’s Militia: The Frigate South Carolina during the American Revolution*. Kent, Ohio: Kent State Univ. Press, 1999. 235pp. \$39

James Lewis, who teaches history at Western Carolina University, believes that the frigate *South Carolina*, in its two-year career late in the American Revolution, left a bigger paper trail than any other warship of the era. That is probably true, because nothing in its existence was simple. First, it was not

even a warship of the federal government but of the state of South Carolina. Even in that sense, it was not “naval”—the ship (built in Holland as *L’Indien*) had been bought, fitted out, manned, and commissioned in 1780 essentially as a private speculation, to generate prize money for its (absentee European) owner. The logistical and technical demands of any such ship—this one was among the largest of its rate—were massive, constant, and complex, and *South Carolina* had no supporting infrastructure at all. Everything had to be done from scratch or done without, bought and paid for (or not), argued about, and generally done over again. The ship did capture a

number of prizes, but not enough, and therefore it led a pillar-to-post, hand-to-mouth existence, always cadging stores and repairs, always plagued by dissension and insubordination among its oversized and undertrained crew, and threatened in every port by litigation, bad faith, and manipulation. It must have been something of a relief finally to be captured by the Royal Navy in December 1782, hours out of Philadelphia—leaving human and financial loose ends that fill the last four chapters of Professor Lewis’s book. It is an astonishing story. Maps, appendices.

OF SPECIAL INTEREST/FROM THE EDITORS

THE EDWARD S. MILLER RESEARCH FELLOWSHIP IN NAVAL HISTORY

The Naval War College Foundation intends to award one grant of a thousand dollars to the researcher who has the greatest need and can make the optimum use of research materials for naval history located in the Naval War College's Archives, Naval Historical Collection, and Henry E. Eccles Library. The recipient will be a Research Fellow in the Naval War College's Advanced Research Department, which will provide administrative support. Submit detailed research proposal, c.v., one letter of recommendation, and relevant background information to: Miller Naval History Fellowship Committee, Naval War College Foundation, 686 Cushing Road, Newport R.I., 02841-1207, by 1 August 2001. Employees of the U.S. Naval War College or any agency of the U.S. Department of Defense are not eligible for consideration; EEO/AA regulations apply.

ERRATUM

In our Winter 2001 issue, on page 147, an editorial insertion in Captain H. F. Rommel's letter commenting on "The Military Response to Terrorism," by Mark Kosnik, incorrectly located that article in our Summer 2000 issue. In fact, Captain Kosnik's article appeared in our Spring 2000 issue.

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