Deterrence at the Operational Level of War

James Blackwell

Let us not make the world safe for conventional war.

—Michael Quinlan, *Thinking About Nuclear Weapons*

Deterrence was a strategy of the Cold War. It guided the development of strategic concepts even when nonnuclear operations were the predominant concern of the US military, including conventional warfare in Korea and Europe and counterinsurgency in Southeast Asia.

Today our understanding of deterrence has atrophied. In fact, deterrence has been incarcerated into one of two holding cells, as if it were some kind of contagion that requires quarantine. For all operations that might involve employment of nuclear weapons, campaign planning has become the exclusive jurisdiction of US Strategic Command (STRATCOM). Even there, deterrence is but one of six missions.[1] For the geographic combatant commands, deterrence is confined to one phase of a joint campaign, one that is most often more hope than plan. Phase 2 of the joint campaign, "Deterrence," has in fact become mostly all about moving forces into the theater for the purpose of seizing the initiative or mounting a defense rather than deterring the conflict from happening altogether.

This conceptual decline occurred for no apparent reasons. In the 1990s, many became convinced that our conventional combat power was so superior we did not need nuclear weapons to deter—conventional capabilities would be sufficient. Then in the beginning of the twenty-first century we became—rightly—focused on winning the war against violent extremists and conducting counterinsurgency campaigns.

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In so many ways we now have deterrence all wrong—especially during campaign planning. For example, in the Joint Capabilities Integration and Development System (JCIDS) we combine deterrence capabilities with the force application joint capability area. As a result, platforms such as intercontinental ballistic missiles (ICBM), sea-launched ballistic missiles (SLBM), reentry vehicles and associated warheads, warhead arming, fusing and firing mechanisms, and long-range bombers—systems we hope never to use in nuclear combat—have to compete for resources with fighter aircraft, attack submarines, and MRAPs (mine resistant ambush protected vehicles) on the basis of military utility. This is a competition in which nuclear capabilities will never prove to be cost-effective to those who would rather fight than deter.[2]

It is time now to reinvent deterrence for the operational level of war in the twenty-first century. Deterrence is still about creating fear of consequences, but we have to apply military power to a vastly different world than the one in which the concept was created. Focusing on the concept of deterrence and its complexity is instructive at the operational level of war. Campaign planners should reconsider some fresh axioms for integrating deterrence.

The Concept of Deterrence

The deterrent value of nuclear weapons is inherent in the terrible nature of the destruction they can cause. Hence, the Joint Publication (JP) 1-02 definition of deterrence, "the prevention from action by fear of the consequences . . . a state of mind brought about by the existence of a credible threat of unacceptable counteraction," remains relevant for the twenty-first century. Indeed, the English word *deter* is derived from the Latin *de,* away from, and *terrere,* to frighten. One of the impenetrable basics of deterrence is the fundamental paradox that nuclear weapons exist never to be used. The reason for this paradox is in the basic physics of nuclear weapons. These things are not, as many have asserted, subsets of "kinetic" military capabilities. While distinct from nonkinetic capabilities, such as those in the cyber and space domains, nuclear weapons are certainly not simply more-powerful forms of classic firepower. Indeed the kinetic energy of a nuclear explosion, while orders of magnitude more powerful than that of an equivalent mass in a conventional weapon, is typically no more than half the total energy output of a nuclear device. The other half is distributed over thermal and radiation effects that no conventional munition can

generate. This is what sets them so far apart from other weapons in the history of human conflict.

Because nuclear weapons effects are so terrible, we must not blur the distinction between "nuclear" and "conventional" weapons, even if we feel compelled to create new categories for cyber, space, and informational effects that are "nonkinetic." Instead, we should explore how to integrate nuclear with conventional and nonkinetic capabilities into a new, comprehensive framework for deterrence.

Indeed, US STRATCOM's *Deterrence Operations Joint Operating Concept* (*DO JOC*) provides a framework for doing just that. The 2006 version of this document expands on JP 1-02 by asserting, "Deterrence operations convince adversaries not to take actions that threaten US vital interests by means of decisive influence over their decision making."[3] It suggests to planners that they can achieve decisive influence by credibly threatening to impose costs, deny benefits, and/or encourage restraint. The *DO JOC*'s purpose is to describe "how joint force commanders will conduct deterrence operations through 2025." It provides a necessary and useful framework for doing that within STRATCOM, but it is insufficient to guide the development, application, and employment of deterrence operational concepts among the geographic combatant commands or the development of deterrence capabilities by the services.

The Growing Complexity of Deterrence

Today, the context in which deterrence must be applied has grown so complex that the military must find ways to apply it at the operational level of war. We cannot leave it exclusively to academics and policymakers. Four global trends drive our understanding of deterrence at the operational level.

We Live In a Multipolar Nuclear World

According to the Carnegie Endowment for International Peace, there are nine nuclear-armed states (the United States, Russia, China, France, the United Kingdom, Israel, India, Pakistan, and North Korea).[4] This multipolar nuclear world will function systemically more like a balance-of-power world.

In a classic balance-of-power system, conflicts tend to be characterized by shifting coalitions rather than contending alliances. While this may mean that post–Cold War relationships among the United States, Russia,

and China are more likely to be stable in strategic terms, it may also mean that medium nuclear powers, such as France and India, will become key to future coalition relationships among the three larger nuclear powers. It may also mean that the United States will have to devote greater effort to building and maintaining strategic relationships since no single player can dominate the smallest coalition in a balance-of-power system. However, actions taken to deter one nuclear state will affect the others in complex ways that may present unforeseen dilemmas in dealing with a particular crisis.

For example, if a crisis between the United States and China were somehow to devolve into a conflict in East Asia and both sides maneuvered large military forces across the region, how would nuclear-armed India comprehend and interpret the various moves and countermoves? While India might be confident that neither the United States nor China would threaten it directly, the outcome of the crisis would have a profound effect on India's strategic interests. A risk-averse India would inexorably be drawn to the crisis and would find itself in a position of being solicited as the potential swing vote in terms of the weight of its own military power. This would not necessarily be explicit; it could quite easily take the form of precautionary mobilizations and movements of forces to deter China from taking advantage of opportunities to reengage in their long-standing border disputes. After all, China is the only nuclear power in history that has attacked another nuclear-armed opponent when it invaded Soviet territory in 1969. And how then would Pakistan respond to strategic actions by India? In some ways we may thus appear to be moving out of the twentieth century into the nineteenth.

We Also Now Live in a Proliferated Nuclear World

This means that lesser nuclear states and nonstates add increased risk of catalytic effects. Gone are the days when proliferation could be considered a good thing. The historic reasoning was if two countries were mutually deterred from going to war with each other by possession of nuclear weapons, then stability would increase as more countries acquired them. There would be fewer wars, and more countries would likewise be deterred. In reality, today's proliferated world is the opposite case, with the most immediate and extreme dangers being nuclear proliferation and nuclear terrorism.

Defiant proliferators seek nuclear weapons not to deter but to employ. At the same time, lesser nuclear states are much more likely to use the few nuclear weapons they possess.[5] In a conflict situation, once deterrence has

failed, lesser nuclear states' incentives are to use nuclear weapons first, before greater and medium powers remove them by other means. Once such an adversary initiates use of nuclear weapons, it is not likely to be restrained from further use of a limited arsenal, since there will be enormous pressure to use them or lose them.

Nuclear proliferators are also more risk-acceptant than responsible nuclear-armed states. They are more likely to adopt a first-use policy, to use all they have, and to provoke their use by others. Another complicating factor is coalitions of nuclear states. Coalitions of lesser nuclear states can disperse the effects of a response from a larger opponent and thus absorb more destruction and suffer more punishment than could a single larger nuclear state. Responsible nuclear powers must develop concepts of deterrence operations that will prevent such opponents from taking those risks by deterring the smaller power's use of nuclear weapons. US joint forces will therefore need new operational concepts for military capabilities to prevent such conflict and for operating on battlefields characterized by limited use of nuclear weapons.

The Behavioral Model of Deterrence Will Predominate

Cold War deterrence was built on the rational actor model, which emphasizes the intellectual nature of deterrence. It holds that the threat by an opponent to use nuclear weapons, resulting in sure destruction of the other, would be so risky that no one—regardless of cultural or behavioral attributes or institutional decision-making processes—would ever conclude they could prevail in such an ultimate nuclear contest. Bernard Brodie, Albert Wohlstetter, Herman Kahn, and Thomas Schelling are generally recognized as the intellectual founders of the rational actor school of deterrence.

Theorists developed many ways to conceptualize this objective calculus, from game theory to expected utility models. Each Cold War crisis has been analytically dissected, with the result that the United States and the Soviet Union developed mutual understanding of the limits of escalation and the "redlines" of crisis behavior and military action, though, as a result of post–Cold War assessments, many of these understandings are now demonstrably known to have been inaccurate. Widespread acceptance of the rational actor model resulted in a prevailing strategic deterrence orthodoxy of variations on the theory of "mutually assured destruction" (MAD), which today still commands widespread adherents. Journalist James Fallows famously characterized strategic deterrence concepts and related

arms control and defense policies based on the theory of MAD as akin to medieval theology.[6]

In contrast, the behavioral school emphasizes the cognitive nature of deterrence as applied to individuals, groups, organizations, and nations. A number of Cold War analysts recognized the psychological basis of deterrence. Robert Jervis, for example, argued that understanding each side's values, beliefs, and perceptions was necessary to comprehend their decision making. Ultimately, deterrence is in the mind of the deterred. Thucydides attributes to Hermocrates: "Nobody is driven into war by ignorance, and no one who thinks he will gain anything from it is deterred by fear . . . when there is mutual fear, men think twice before they make aggressions upon one another."

In the 1970s, behavioral scientists began to open new windows into the mind. The 2002 Nobel Prize in economics went to Princeton psychologist Daniel Kahneman for his work in the 1970s and 1980s on the psychology of judgment and decision making. Kahneman and his colleagues argued that people do not employ rational decision making in their actual processes in life; they do not try to collect all the possible information available to maximize the payoff of existing choices. Instead, they place boundaries on the kinds and types of data they collect and then employ "rules of thumb" rather than complex formulas of utility to rationalize choices. Such "bounded rationality," according to Kahneman, leads to errors of judgment from emotional bias and from using faulty decision-making heuristics.

Real-world case studies have shed new light into the psychology of national leaders when nuclear weapons might be involved in crises.[7] Many behavioral scientists have attempted to minimize the impact of such bias and develop methods to apply the ideal, rational decision-making model. In his famous book, *Every War Must End*, Fred Ikle wrote,

> It is not enough that those who can deliberately start a war should at no time come to believe that their nation, or their "cause," would be better served by going to war than if peace were maintained. For even if this condition is met, it will not be sufficient if wars can be started by . . . leaders who fail to think coherently about how the fighting will end, or who, in some perverse stubbornness, no longer care if it ends in disaster for their own country.[8]

The reality of the growing complexity of deterrence means that we have much to gain from deeper understanding of how to apply the behavioral approach to deterrence operations.

Emerging Domains of War—Cyber and Space

Cyber and space domains are contributing a tremendous measure of complexity to the challenge of deterring future adversaries. Deterrence and escalation control now cross multiple domains of war. Attacks against space assets intended to blind or dazzle for tactical or operational effect may be perceived as precursors to broader, deeper strategic attacks. Computer network attacks may have huge unintended consequences for the entire global system. And new conventional capabilities may have far-reaching deterrent effects. In Europe, for example, while the United States and Russia argue over the role of ballistic missile defenses in our strategic relationship, some assert that the alliance can afford to trade off nonstrategic nuclear capabilities while deploying ballistic missile defenses. Also, there is an emerging debate on the deterrent value of conventionally armed intercontinental missiles that could fly a ballistic trajectory for part of their path and then shift to a more maneuverable mode during reentry.[9] Such complex escalation and deterrence relationships heighten the potential for misperceptions and increase the risks of unleashing catalytic escalation forces.

In this milieu, Herman Kahn's ladder of escalation is less helpful as a mental model of deterrence. In a bipolar world, escalation was linear. Now, escalation can function across many dimensions not limited to the nuclear escalation ladder. In the multipolar, proliferated nuclear world, deterrence exists across at least four domains simultaneously—conventional, nuclear, cyber, and space. Dr. Chris Yeaw, Air Force Global Strike Command's chief scientist, likened this to a vortex in which each side could escalate or deescalate simultaneously across multiple domains and even jump from one ladder to another, making crisis management and escalation control much more complicated.

Ten Axioms for Campaign Planners

Today we must deter across multiple domains in local, regional, and global wars in a multipolar, proliferated nuclear world. While devoting the weight of effort to winning current fights and advancing the operational art of counterinsurgency and counterterrorism campaigns—and future complex hybrid operations—we cannot afford to neglect the important prospects of campaigns of the future that will carry greater risk and con-

sequence. To begin reinvesting our intellectual capital in deterrence, military professionals should consider several fresh approaches.

Go to School on Deterrence and Nuclear Doctrine

The 2010 *Joint Operating Environment* states the following: "For the past twenty years, Americans have largely ignored issues of deterrence and nuclear warfare. We no longer have that luxury."[10] Illustrative of the point is Air Force Doctrine Document (AFDD) 3-72, *Nuclear Operations*,[11] the only doctrinal manual in the US Department of Defense on the conduct of campaigns involving nuclear weapons. While it provides a solid grounding in the basics, it needs to be revised to account for the new US strategy and the Nuclear Posture Review. US STRATCOM's *Deterrence Operations Joint Operating Concept* provides a more expansive treatment but, as with all JOCs, it is aimed at guiding the development of future capabilities rather than the conduct of campaigns. Also, English translations of China's military doctrine on deterrence are available in open sources.[12] Campaign planners across the joint forces should read these documents. And, they should be taught in service schools.

Apply Deterrence in Each Phase of the Campaign

Joint Publication 3-0, *Joint Operations*, and the Joint Operational Planning and Execution System (JOPES) label Phase I of a joint campaign "Deter," and in practice joint forces also have implied tasks for deterrence across each phase; they may also have specified deterrence tasks in any phase.

Phase 0: Shape. Strategic shaping occurs every time the US Air Force and the Navy conduct test launches of ICBMs from Vandenberg AFB and from Trident ballistic missile submarines. Data sharing between the United States and Russia in accordance with arms control agreements also shapes the stability of our mutual deterrence relationship.

No matter what the particular mission assigned in any theater, the US military will be building partner relationships that contribute to its capacity to deter potential adversaries, reassure allies, and maintain the stability of the central nuclear balance among the United States, Russia, and China. When the last Tomahawk land attack missile–nuclear (TLAM–N) is retired from the Navy's arsenal, only dual-capable aircraft (nuclear-capable B-52 and B-2 bombers, F-16 and F-15 fighters, the F-35 Joint Strike Fighter, and NATO Tornado aircraft) will be available to provide visible evidence of our capability to conduct nuclear operations. These capabilities

send a message to key allies who rely on the US extended deterrence umbrella, allies who might otherwise feel compelled to seek their own nuclear capabilities. The continuous bomber presence mission in Pacific Command is a visible signal of US potential during real-world Phase 0 operations.

Phase I: Deter. In this phase, standard "flexible deterrence options" (FDO) are available to demonstrate US capability and resolve with the intent of causing the adversary to deescalate and avoid hostilities. The Joint Advanced Warfighting School of the Joint Forces Staff College teaches that FDOs are

> pre-planned . . . actions carefully tailored to send the right signal and influence an adversary's actions . . . developed for each instrument of national power—diplomatic, informational, military economic, and others (financial, intelligence and law enforcement DIMEFIL)—but they are most effective when used in combination with other instruments of national power . . . FDOs facilitate early strategic decision making, rapid de-escalation and crisis resolution by laying out a wide range of interrelated response paths . . . confront the adversary with unacceptable costs for its possible aggression.[13]

Examples of military FDOs include increased readiness posture, alert status, and force protection measures; heightened intelligence, surveillance, and reconnaissance; show-of-force actions; public diplomacy and strategic communications; and deployment orders that move military forces into the joint operations area without placing US forces in jeopardy if deterrence fails.

Typical post–Cold War FDOs eschew employment of nuclear capabilities, but the growing complexity of deterrence in a multipolar, proliferated nuclear world may require demonstrating the potential to employ the strongest military measures. Deployment of nuclear-capable airpower remains available to signal US capability and resolve visibly and flexibly. When the force structure implementation of the 2010 Nuclear Posture Review (NPR) is decided, there likely will be a number of nondeployed strategic nuclear delivery vehicles that will provide additional FDOs that may include movement of hedge warheads and stored ICBMs. The NPR also calls for development of "other basing modes" of ICBMs that may provide additional nuclear FDOs in coming decades. Space, cyber, and future conventional capabilities provide an even wider range of additional FDOs. Campaign planners need to be schooled in the full array of military capabilities available for FDOs.

Phase II: Seize the Initiative. For this phase of the joint campaign, future global strike capabilities will provide forces that can prevent an opponent from initiating combat on its terms. Conventional warheads contained in maneuverable, trans-atmospheric vehicles launched on ballistic missiles—systems that are not prohibited by arms control treaties—may enable limited, prompt global strikes that can deny an opponent the benefit it may seek from employment of its limited number of nuclear weapons. For example, a North Korean Taepodong ICBM on the launch pad with a nuclear warhead might be destroyed with a conventional munition within less than an hour of a launch order from the president. Theater campaign planners need to know how to employ and coordinate such strikes as deploying forces stage into the theater.

In some cases, it may be that conventional war-fighting capabilities are insufficient to seize the initiative. In those situations the joint force commander may choose to employ space or cyber capabilities to pave the way for an ensuing decisive operations phase. The capacity to conduct such operations would provide theater campaign planners with powerful deterrent threats. The theater joint force employed in cyber and space operations will also need to have robust, layered missile defenses as a means of deterrence by denying the enemy any benefit from ballistic missile strikes against US forces in the theater.

Phase III: Decisive Operations. The main effort of a joint campaign is to defeat the opposing force in Phase III. Generally this will be conducted by employment of decisive conventional combat power. But in dealing with a nuclear-armed opponent or nuclear-armed ally of a conventionally armed opponent, prudent joint campaign planners will need to prepare branches and sequels that anticipate potential first use of nuclear weapons by a risk-acceptant adversary. Here, again, the theater campaign planner may have future global strike capabilities available to support deterrence during the Phase III main effort. The Air Force chief of staff has said, "The future will call for at least as much if not more deterrence" capability than the service currently wields. Gen Norton A. Schwartz called for a low-cost, flexible family of systems that can meet many possible needs, from precision strikes in an asymmetric environment to full-scale bombing campaigns against heavily defended airspace, centered on a "penetrating bomber."[14] Future theater campaigns will have to incorporate such capabilities into Phase III planning.

Phase IV: Transition. Deterrence is not irrelevant to the ending of hostilities and termination of conflict. Capabilities that create fear of consequences in an opponent that has been defeated, is exhausted, or just wants to quit the fight remain important.

Consider the case of the Korean War. In 1950, after the Inchon landing enabled UN forces to fight their way back up the peninsula from the Pusan perimeter, Russia and China rejected any negotiations until all foreign troops were withdrawn. In 1951, after the advance into North Korea, General MacArthur was relieved. Then China dropped its demand and, with North Korea, agreed to a cease-fire along the demarcation line. But the fighting continued for two more years as North Korea and China insisted on mandatory repatriation of prisoners of war captured by UN forces and held in the south. Casualties mounted, reaching numbers greater than those before the cease-fire. In 1952 Dwight D. Eisenhower was elected US president and sought an end to the war by communicating nuclear threats to China and North Korea through third parties. He approved military planning to move atomic artillery and aerial bombs into place; operational staffs ordered their movement into position; commanders readied these nuclear forces for employment in a campaign to be executed on order if the enemy continued to be intransigent. Preparations for use of atomic weapons were made apparent to the Chinese and the North Koreans. When Joseph Stalin died in 1953, his successors put pressure on the Chinese and North Koreans to adopt a more conciliatory posture, and the communists finally accepted voluntary repatriation and a truce at Panmunjom.[15]

Phase V: Enable Civil Authority. Upon cessation of hostilities, military capabilities will still be important to provide deterrence of potential adversaries not involved in the fight who might nevertheless seek to achieve advantage presented by the opportunity of a neighbor's defeat or the disorder that could ensue from the lack of civil authority in a provisional military occupation. If the conflict involves nuclear weapons, US deterrence capabilities will be critical for providing an umbrella of protection while civil society is rebuilt.

Do No Harm to the Stability of Central Strategic Deterrence

The nuclear great powers will watch any crisis involving the United States very closely. Even if the strategic nuclear balance among the United States, Russia, and China becomes more stable, this will not guarantee continued stability in economic, political, or diplomatic competitions.

Regardless, in future conflicts we will continue to find ourselves risk-averse to provoking heightened concerns for the vital national interests of Russia and China. It will be particularly important to consider the implications military action against a particular adversary will have on its neighbors in this n-power game.

There is reason for special concern in this regard for the stability of our relationship with China, for we hardly know them. In the Cold War we devoted billions of dollars and enormous human resources in trying to learn how the Soviets made strategic decisions, to discern their intent, and to assess their true capabilities. And sometimes we still got it wrong. We have devoted nothing near that effort to understanding the intentions and capabilities of China.

It is equally important for them to understand us. At least Chinese strategists can study our Cold War crisis behavior. We can be sure that they read Schelling and Allison, but will that explain what our twenty-first-century redlines would be? How would the United States respond to a Chinese high-altitude detonation of an electromagnetic pulse weapon? Does the United States consider attacks in outer space to be akin to attacks on our soil? These kinds of questions go beyond our declaratory policy, reaching to the essence of our decisions. Not only are China's military writings more guarded and enigmatic than ours, they have never had a nuclear crisis of their own from which to learn about the pressures and stresses that affect communication of intent when a strategic nuclear exchange potentially hangs in the balance.

Maintaining crisis stability in a multipolar nuclear world requires more stringent assumptions about communication, trust, and commitment than with only two players, where weaker assumptions might suffice. Since the permutations and combinations inherent in multiactor crises are more numerous, creating confidence-building measures among nuclear-armed states may become a particularly useful method for building crisis stability. Military-to-military exchanges cannot guarantee friendliness, but they can promote understanding.

Such exchanges could produce deeper understanding of the strategic cultures of nations and nonstate groups that might acquire nuclear weapons. Culture plays a large role in strategic relationships; therefore, it will serve us well to invest in the kind of cultural understanding only prolonged effort provides. During the Cold War, the United States and the Soviet Union both reflected the world of the enlightenment in advancing their own

unique "internationalisms"—democracy in the case of the United States, communism for the Soviet Union—according to Prof. Paul Bracken, who notes,

> Compare such noble internationalisms with nationalism driving the new nuclear states. Pakistan uses Islamic fundamentalism to try to build an extension of nationalism in Afghanistan and Central Asia; North Korea seals itself off from the outside world with a *juche* philosophy of self-reliance and convinces its people that they are respected by the countries of Asia. These behaviors arise out of an emotional nationalism that one people is better than another. The United States and the Soviet Union had their own absurd ideas, to be sure. But neither believed that their peoples were innately superior to each other, only that their core political beliefs were.[16]

Understand the Limits of Conventional Deterrence

There have been many debates in the United States on the value of conventional deterrence. Indeed, the Nuclear Posture Review sets us on a path to zero nuclear weapons in part based on the belief that conventional means may one day fully substitute for nuclear weapons. Surely our 4,000 years of human history with conventional warfare—compared to 65 or so with nuclear weapons—can teach us something empirically about the efficacy of conventional deterrence.

In the 1980s Paul Huth and Bruce Russett conducted an interesting statistical study of deterrence.[17] They looked at 54 case studies of twentieth-century warfare in which one side attempted an initial deterrence strategy and then applied a methodology to normalize all the appropriate factors so they could draw comparisons among the studies. They concluded that, historically, deterrence has worked a little more than half the time (31 out of 54 cases) and nearly always by denial of benefit rather than by imposing cost. They also found that it never worked in great-power wars, only in regional conflicts. And, when deterrence did work, there was usually both a strong relationship between a great-power defender and its protégé as well as a record of arms transfers from the defender to its protégé. In the six instances in which at least one side was a nuclear power, possession of nuclear weapons by the defender had no effect on the success or failure of deterrence in preventing the outbreak of war.

Conventional deterrence, then, might work about half the time. Campaign planners who must develop flexible deterrent operations should study Barry Blechman's comprehensive analysis from the 1970s of what

worked and what did not when conventional forces were employed to affect the decision-making processes of potential adversaries.[18] This was an exhaustive analysis of dozens of Cold War–era case studies and is well worth rediscovery for the twenty-first century.

Plan for Operations on a Nuclear Battlefield

If it is now much more likely that some rogue state or nonstate actor will detonate a nuclear weapon in our lifetime, or if the consequence of a multipolar nuclear world is greater risk of nuclear war through miscalculation, then it stands to reason that we must prepare our forces for operations on a nuclear battlefield, even if we do not resort to first use or responding in kind ourselves. There is growing concern in the analytic community about the prospects for limited nuclear war in the near future.[19] Even novelists are speculating on how radical Islamist organizations possessing a number of nuclear weapons might use them in an operational campaign as opposed to the usual scenario of detonating a single device in a major Western city during a terrorist attack.[20]

We are ill prepared for this. While there are regulations, procedures, and joint doctrine for managing the consequences of an adversary's use of weapons of mass destruction, there is no doctrine for conducting combat operations on a nuclear battlefield.

Assess the Credibility of Deterrence

How do you judge a negative? That is, how do you know your attempts at deterrence are successful? What indicators and warnings reveal the enemy's intent? What are the priority intelligence requirements for a deterrence campaign or line of operation? Is the opponent not attacking because it is deterred or because it is just biding its time for a massive response that you did not anticipate? There are many who argue that answers to these questions are simply unknowable and deterrence must rest on blind faith, or that the planner will have to conduct operations as if the deterrence phase will fail—a stratagem that, of course, risks self-fulfillment.

Some recent methodological and empirical work can help campaign planners discern whether deterrent threats are achieving the intended effects of creating fear of consequences in the opponent's calculations. Daryl Press conducted case studies into instances of a country communicating deterrent threats to an opponent to prevent the outbreak of war among great powers. He looked at German assessments of British and French

threats in 1938–39, British and US assessments of Soviet threats in the Berlin crises of 1958–61, and US assessments of Soviet threats in the Cuban missile crisis of 1962. Press found that deterrence works when a country makes threats that the opponent believes it is capable of carrying out and when the opponent believes its adversary has a strategic interest in doing so. In other words, the prerequisite for deterrence has less to do with rational calculations of risk and intent, even if the adversary has a reputation for bluff, bluster, and subterfuge. The success or failure of deterrence in those cases had more to do with perceptions of capability and willingness; what matters most is the here and now, not past behavior.

This suggests that assessing the credibility of a deterrent threat should begin with an objective look at what the Soviets called "correlation of forces," or the military balance that can be brought to bear in a crisis. We discovered with the Soviets that different sides can have different ways of measuring military power, so it will be prudent to maintain a capacity to emulate the potential adversary's military analysis and decision-making processes to reflect accurately its understanding of our military capability. It may use measures of merit quite different than our own and combine them in ways that would appear strange to our own method of conducting campaign analysis. In any case it is vital not to fall prey to the temptation of mirror imaging when conducting an assessment of the credibility of a deterrent threat.

Press also suggests several ways to assess intent. He asserts that "[t]he evidence for credibility is in the adversary's private communications about their perceptions of our capabilities and intentions and their reasoning behind their own policies."[21] In his four case studies, Press found strong support for the conclusion that there are two primary sources of evidence about the credibility of a deterrent threat in the mind of the adversary. First, we can turn to the opposing decision makers' statements about their adversary's credibility. They often make statements about their expectation of the explicit likelihood that we will carry out our threats and promises. Second, Press says to look at the very policies that decision makers advocate during crisis. Credible threats generate more calls for concessions than do threats that are not credible. If the opponent decision makers advocate a hard-line policy, they do not believe our threat is credible. If they argue for caution, they assign higher credibility to our threat.

Press' historical case studies rely on archival source material for a retrospective look at what deterred and what did not. Campaign planners will,

of course, not have the luxury of hindsight or even foresight to see into the enemy's decision making in the future. However, today's information operations tools can provide timely insights into the kinds of evidence that are needed to assess credibility of deterrent threats. We should be particularly capable of developing communications intercept and computer network exploitation that would allow collection of timely intelligence on the opponent's internal communications. A number of tools exist for exploiting massive amounts of data to discern relevant content that would reveal the kinds of discussions Press suggests would shed light on the credibility of our deterrent threats in the minds of our opponents. Campaign planners need access to those kinds of intelligence capabilities and analytic tools.

Beware the Potential for Cascading Effects

If escalation is more like a vortex than a ladder, then chances are a crisis in the multipolar, proliferated nuclear world will be more like 1914 than 1939 in terms of its potential for spiraling out of control. The twenty-first century is fraught with risks of misperceptions among crisis participants from divergent cultural perspectives and with clashing strategic interests. These risks are compounded by the fact that every newly nuclear state goes through a period of learning about its new role; it must learn both how it intends to employ its nuclear capabilities to achieve their deterrent effects and how to keep them safe, secure, and reliable in their particular geopolitical environment. Unanticipated consequences abound with emerging warfare domains such as cyber and space. Timelines for decision, already made very short by the Cold War capabilities of ballistic missiles, will be even further compressed by nearly instantaneous and ubiquitous effects of a globally interconnected world order.

In this milieu, decision superiority will become a capability of military necessity. Decision superiority is simply the capacity to make better decisions faster than opponents. Sometimes this will depend on one's own command of the "observe, orient, decide, act" cycle. But in many exercises, experiments, and war games, the military has discovered that it just cannot execute the "orient" phase fast enough to get inside some opponents' decision cycles. This is particularly evident in exploring how to conduct ballistic and cruise missile defense against a sophisticated opponent who employs not only very capable missiles but also large numbers of them in complex operational concepts of attack (e.g., surge, swarm,

multiple, and changing directions). There is an emerging concept for command and control that suggests we will need military capabilities to enable us to decide and begin to act well before we have traditionally sufficient information to conduct the military decision-making process. Another complementary approach for achieving decision superiority may lie in the conduct of denial, deception, and disruption concepts to slow down and degrade the opponent's decision cycle.

We can develop ways to make decisions faster, but will they be good decisions? How do we provide decision-making support that enables not only *faster* decisions but also *better* decisions? In carrying out twenty-first-century deterrence operations, we need to make decisions that are better in the sense that they produce actions that not only achieve our geopolitical objectives but also do not trigger a chain of consequences that result in nuclear weapons use. Here again, we need more work in the behavioral model of decision making rather than the rational actor model.

Leverage the Cognitive Domain of War

When he served as director, force transformation in the office of the secretary of defense, RADM Art Cebrowski asserted that wars are won or lost in the cognitive, rather than in the physical, domain.[22] By this he meant that the information revolution has ushered in a new era in which mastery of the physical domain of war is no longer sufficient. His thinking on this is most applicable to the problem of deterrence in the twenty-first century, where we must develop military campaigns to deter the use of nuclear weapons by a variety of potential adversaries.

Kahneman's behavioral science approach to economics is built on Herbert Simon's pioneering work on prospect theory of choice making, describing how decisions are made among alternatives with uncertain risks. Kahneman extended prospect theory to examine more closely the biases and heuristics in human decision making.[23] The prospect theory school of decision making asserts that, although such skewed thinking was generally successful, or at least good enough for economic satisfaction if not maximization of utility, nevertheless the impact of such bias could be minimized to approach the ideal, rational decision-making model.

In the 1990s an alternative behavioral school emerged in contrast to Kahneman's adaptation of prospect theory, suggesting that such heuristic decisions are after all quite natural and, in terms of efficiency in doing the things necessary for human progress—namely survival, evolution, and

domination by the species—often even better than optimizing strategies. What Kahneman found to be bias, deflecting the human mind from the ideal, researchers such as Gary Klein and Gerd Gigerenzer viewed as adaptive, emergent behavior. Their field research suggests that humans, perhaps regardless of culture, make decisions based on a few common heuristics that enable decision making that is fast enough to avoid falling prey to other species and sufficiently frugal in terms of exploiting the cognitive capacity of the human brain to seek and absorb only enough information necessary to make the decisions at hand.

Klein conducted over 600 field studies of experienced, successful decision makers who were confronted with situations involving incomplete information, uncertainty, high risk, and intense time pressures (e.g., fire fighters, tactical and operational military staffs, medical professionals, nuclear power plant operators, etc.). He concludes, "The evidence that supposedly shows that stress results in decision errors is not convincing . . . experienced decision makers adapt to time pressures very well by focusing on the most relevant cues and ignoring others."[24] Klein argues there are some common sources of error that might be useful for campaign planners to understand and train to minimize. For example, *de minimus sorting* occurs when people in the decision-making chain are aware of disconfirming evidence and may even seek it out but then explain it away; Klein and his research team dissected the USS *Vincennes'* shoot-down of the Iranian airliner in 1988 and concluded that this was the root cause of that error.

Confirmation bias occurs when a person chooses to seek confirming evidence that has little diagnostic value because it cannot help distinguish between alternative hypotheses and does not try to obtain other diagnostic evidence that might disconfirm the favored hypothesis. He cites the example of the 1973 shoot-down of an off-course Libyan civilian airliner by the Israelis as a case of this type of error.

Klein posits that training on countermeasures to such errors would prove useful to campaign planning staffs. One such technique he calls *pre-mortem mental simulation*—a technique especially useful for planners who are often overconfident about the plan they created. This technique asks planners to imagine their plan was executed and failed. The pre-mortem helps reveal hidden or understated risks.

Gigerenzer has focused on laboratory and field research aimed at understanding the elements of the cognitive domain. He suggests that all human decision making boils down to three components that form a heuristic:

search rules used to limit the volume of data considered, *stopping rules* to limit the amount of time and effort spent on collecting data, and *decision rules* to apply in making choices among alternatives.

> Humans and animals make inferences about their world with limited time, knowledge, and computational power. In contrast, many models of rational inference view the mind as if it were a supernatural being possessing demonic powers of reason, boundless knowledge, and all of eternity with which to make decisions . . . we propose replacing the image of an omniscient mind computing intricate probabilities and utilities with that of a bounded mind reaching into an adaptive toolbox filled with fast and frugal heuristics.[25]

If this is so, then military decision making across cultures and across the ages may be reducible to a shared set of common fast and frugal heuristics. If we could determine what some common military decision-making heuristics are, then maybe we could better anticipate an opponent's decision as it is made, perhaps even in advance.

Do Not Assume Opponents without Fear Cannot Be Deterred

Too many military planners assert that defiant proliferators and terrorists are irrational and cannot be deterred, so the only option is that they be killed or captured. There is no empirical analysis to support that argument. There is indeed evidence that rogues and nonstate actors who possess weapons of mass destruction and their means of delivery can be deterred.

Deterrence worked in 1991. The United States conveyed the not-so-veiled threat that if the Iraqis used chemical or biological weapons on US troops, then we would respond with nuclear weapons. Although Tariq Aziz said later that he did not take President Bush's letter to Saddam, we now know that the message was indeed conveyed and that Iraqi generals took it seriously.[26] Indeed, there is emerging evidence that Saddam himself was convinced that the United States would use nuclear weapons on Iraq if he were to order or authorize use of chemical weapons on American troops in the 1991 Persian Gulf War.

Rather than assuming terrorists cannot be deterred, we should conduct the necessary behavioral research to determine just where their fears lie, then apply the threat of military power to create the desired effects on their behavior. Since 9/11 Dr. Jerrold Post, a long-time consultant to the CIA, has studied all major terrorist groups and is one of only a few who has interviewed hundreds of detainees from the war on terror. Dr. Post reports on his interviews,

> [T]wo responses from the terrorists deserve emphasis . . . one concerned the fear of these weapons, of "the silent death," of infectious microbes, deadly toxins and radioactivity. Not everyone wishes to be a martyr, and the danger of handling these deadly chemical, biological, and radiological materials should be emphasized. The second theme was the proscription in the Koran against mass casualties, including killing innocents, and the requirement to not poison the earth and living things.[27]

We need to identify such fears and how nuclear weapons can threaten in ways that speak to those fears.

Develop Innovative Tactical and Operational Forms

Finally, lacking a playbook, we need to develop ways to apply deterrence in this multipolar, proliferated nuclear world. In my own experience across a number of war games and exercises, it is clear that the process of developing deterrence courses of action has become a lost art. Few players or staffs have a sense of the range of capabilities available for deterrence operations, and fewer still have a nuanced understanding of what might deter the particular adversary. In such events, most participants arrive with the deterrence belief that "one size fits all" situations but then quickly come to realize that nuclear deterrence is not a pickup game.

A number of analysts have suggested we need more accurate nuclear weapons with low-yield options to make deterrence credible at the operational level. They argue this would be the case for both regional adversaries and peers.[28] They believe it would work by enabling US forces to hold sanctuaries at risk while minimizing collateral damage to levels even lower than those that would occur if conventional weapons were used.[29] If this approach were adopted, it would require that joint force campaign planners experience a rebirth of expertise in nuclear operations.

New forms of deterrence operations can be developed for this multipolar, proliferated era in which deterrence has grown increasingly complex. We must resurrect joint doctrine for nuclear operations and revise Air Force nuclear operations doctrine. Additionally, the art of military campaign planning must incorporate techniques and procedures for deterrence operations, including deterrence lines of operations that provide deterrence branches and sequels extending across all phases of the joint force campaign. We must involve expert, live, red teams that will produce insight into opponent military decision-making processes while fielding a new generation of analytic tools for planning staffs to measure and assess the credibility of their deterrence planning efforts.

Deterrence Across the Ages

There are those who assert that deterrence is greatly overrated, poorly understood, and desired today mostly out of nostalgia. Not so. Campaign planners in operational joint forces around the globe increasingly find themselves confronted with the challenge of developing concepts of operations that will in practice provide commanders with a realistic likelihood of deterring potential adversaries who are willing to take on the United States of America. The growing complexity of deterrence compels military professionals to develop ways to plan and achieve deterrence at the operational level of war.

Deterrence is a World Cup sport, and we are only beginning to reinvigorate our state of conditioning to play the twenty-first-century game. The practice of deterrence has fundamentally changed, and all the thinking and theorizing we might do should be translated into capabilities and playbooks for the real world. As the United States continues to strengthen its nuclear enterprise, we need to advance the art of deterrence campaign planning and toughen our practices. Deterrence at the operational level of war is an idea whose time has come. SSQ

Notes

1. See http://www.STRATCOM.mil.
2. "While the most important mission of the American military has been to fight and win the nation's wars, the ability of U.S. forces to deter conflict has risen to equal footing. Preventing war will prove as important as winning a war." US Joint Forces Command, *The 2010 Joint Operating Environment*, 18 February 2010, 60.
3. US STRATCOM, *Deterrence Operations Joint Operating Concept*, ver. 2 (Washington: Office of the Secretary of Defense, December 2006), 8.
4. "Proliferation Status 2009," http://www.carnegieendowment.org/files/2009-global-prolif6.pdf.
5. Andrew J. Coe and Victor A. Utgoff, *Understanding Conflicts in a More Proliferated World* (Institute for Defense Analyses, Report P-4426, December 2008).
6. James Fallows, *National Defense* (New York: Random House, 1981).
7. Robert Jervis, Ned Lebow, and Janice Stein, *Psychology and Deterrence: Perspectives on Security* (Baltimore: Johns Hopkins University Press, 1989).
8. Fred Charles Ikle, *Every War Must End*, 2nd ed. (New York: Columbia University Press, 2005).
9. Bruce Sugden, "Speed Kills: Analyzing the Deployment of Conventional Ballistic Missiles," *International Security* 34, no.1 (Summer 2009): 113–46.
10. *Joint Operating Environment* (Suffolk, VA: US Joint Forces Command, February 2010), 53.
11. When published on 1 June 2009, *Nuclear Operations* was designated Air Force Doctrine Document 2-12. The Air Force has since restructured its doctrinal publications, and *Nuclear Operations* is now AFDD 3-72.

12. See footnote 4 in Mark A. Stokes, *China's Nuclear Warhead Storage and Handling System*, 12 March 2010, Project 2049 Institute, http://project2049.net/documents/chinas_nuclear_warhead_storage_and_handling_system.pdf.

13. *Operational Art and Campaigning Primer AY 09-10: Joint Operation Planning Process* (Washington: Joint Advanced Warfighting School, 2009), 334, http://www.jfsc.ndu.edu/schools_programs/jaws/Campaign_Planning_Primer_2010v-4.pdf.

14. John Reed, "Schwartz: Air Force needs new long-range bomber," *Air Force Times*, 14 September 2010, http://www.airforcetimes.com/news/2010/09/defense-schwartz-air-force-new-bomber-091410/.

15. For more detail, see Max Hastings, *The Korean War* (New York: Simon and Schuster, 1987), 318–20. For an analysis as a case study in compellance and deterrence, see Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: Columbia University Press, 1974), 235–41. For a revisionist interpretation, see Rosemary J. Foot, "Nuclear Coercion and the Ending of the Korean Conflict," *International Security* 13, no. 3 (Winter 1988–89): 92–112.

16. Paul Bracken, "The Structure of the Second Nuclear Age," Foreign Policy Research Institute, 25 September 2003, http://web.mit.edu/ssp/seminars/wed_archives_03fall/bracken.htm.

17. Paul Huth and Bruce Russett, "What Makes Deterrence Work? Case Studies from 1900 to 1980," *World Politics* 36, no. 4 (July 1984): 496–526.

18. Barry M. Blechman and Stephen S. Kaplan, *Force without War: U.S. Armed Forces as a Political Instrument* (Washington: Brookings Institution, 1978).

19. *Limited Nuclear War* (Washington: Institute for National Strategic Studies, forthcoming 2011).

20. Ralph Peters, *The War after Armageddon* (New York: Tom Doherty Associates, 2009).

21. Daryl G. Press, *Calculating Credibility: How Leaders Assess Military Threats* (Ithaca, NY: Cornell University Press, 2005).

22. James Blaker, "Arthur K. Cebrowski: A Retrospective," *Naval War College Review* 59, no. 2 (Spring 2006): 129–45.

23. Daniel Kahneman biography, http://nobelprize.org/nobel_prizes/economics/laureates/2002/kahneman.html.

24. Gary Klein, *The Sources of Power: How People Make Decisions* (Boston: MIT Press, 1998).

25. Gerd Gigerenzer, Peter M. Todd, and the ABC Research Group, *Simple Heuristics That Make Us Smart* (New York: Oxford University Press, 1999).

26. Keith B. Payne, "On Nuclear Deterrence and Assurance," *Strategic Studies Quarterly* 3, no. 1 (Spring 2009): 43–80.

27. Jerrold Post, *The Mind of the Terrorist* (New York: Palgrave MacMillan, 2007).

28. See Jason Zaborski, "Deterring a Nuclear Iran," *Washington Quarterly* 28, no. 3 (Summer 2005): 153–67, regarding credibility vis-à-vis adversaries and Keir Lieber and Daryl Press, "The Nukes We Need," *Foreign Policy* 88, no. 6 (November/December 2009): 39–51, in the case of peers.

29. Payne, "On Nuclear Deterrence and Assurance."