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Joint Force Interdependence

Strength Through Diversity

Nonlethal Weapons

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Cover 2 images (top to bottom): Commissioned Officer Training School student hoists herself around pillar during ropes course, part of confidence and team-building exercise for commissioned medical, legal, and chaplain officers (U.S. Air Force/Natasha Stannard); Soldiers with 1st Platoon, Bravo Company, 2nd Battalion, 30th Infantry Regiment, 4th Brigade Combat Team, 10th Mountain Division, move behind mud walls in order to take over enemy sniper position during Operation *Charkh Restoration*, Charkh District, Logar Province, Afghanistan (DOD/Sean Casey); Sailors direct F/A-18E Super Hornet assigned to Strike Fighter Squadron 31 Tomcatters on flight deck of aircraft carrier USS *George H.W. Bush*, which supports maritime security operations, strike operations in Iraq and Syria as directed, and theater security cooperation efforts in U.S. 5th Fleet area of responsibility (U.S. Navy/Brian Stephens).

In this Issue

About the Cover
Marine with Bravo Company, 1st Battalion, 7th Marine Regiment, stands prepared for enemy contact in Helmand Province, Afghanistan, during 3-day mission in town of Gereshk, which involved numerous firefights with Taliban insurgents, July 2014 (U.S. Marine Corps/ Joseph Scanlan)

Joint Force Quarterly is published by the National Defense University Press for the Chairman of the Joint Chiefs of Staff. *JFQ* is the Chairman's flagship joint military and security studies journal designed to inform members of the U.S. Armed Forces, allies, and other partners on joint and integrated operations; national security policy and strategy; efforts to combat terrorism; homeland security; and developments in training and joint professional military education to transform America's military and security apparatus to meet tomorrow's challenges better while protecting freedom today. All published articles have been vetted through a peer-review process and cleared by the Defense Office of Prepublication and Security Review.

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Letter

To the Editor: As I read Rebecca Patterson and Jodi Vittori's article titled "Why Military Officers Should Study Political Economy" in *Joint Force Quarterly* 75 (4th Quarter 2014), I reconsidered my own understanding of the term *political economy*. At one time I was admittedly unsure of its precise meaning, although I could make some informed guesses, and thankfully the authors do a good job of giving readers many opportunities to understand what it means based on context in various passages.

However, this chance encounter with a phrase that field-grade officers might not see regularly in their professional reading brought to mind the entire topic of language and its challenges. I have seen a phenomenon up close and personal here at the U.S. Army Command and General Staff College, particularly in some of the readings we historians assign to our students in books such as *Makers of Modern Strategy*. I can vaguely recall being a bit miffed the first time I chanced across the word *particularism*, but then I looked it up and turned the tables on my own ignorance.

So-called big words, words such as *misanthropic*, *heuristic*, and *epistemological*, too often serve as a convenient way for the intellectually insecure to withdraw from the battlefields of words and ideas and retreat to the safer ground of simple, monosyllabic conversation. There is a unity and beauty to such conversation that is admirable and even desirable in writing and speaking, but big words are not without value. They add texture, richness, and nuance to writing and speaking if not misused—which is often how we see and hear them used *if* we are honest. At other times, people use big words to confuse, obfuscate, and intimidate.

When midgrade officers encounter unknown words, they should act like Napoleon or Nelson and treat them the way they might treat a difficult military problem. *Solve it*. What do I mean? I mean *do not* regard big words as an enemy. Instead, regard *your own ignorance* of their meanings as the enemy and the writer or speaker as an unwitting or even intentional ally of your adversary (although withhold judgment for a moment on that last part). Do some intelligence preparation of the battlefield. Perform some reconnaissance (another big word, but one military professionals are comfortable with). In other words, find out what the word means, not only in its primary sense (usually the first definition in a dictionary), but also in its secondary or idiomatic (normal use in conversation) sense if these are provided. This will further allow you to accomplish three useful things.

First, you have now added that word to your own "force," so it is no longer in support of the "enemy" (the unknown, ignorance). Secondly, learning the meaning of a word will allow you to evaluate its importance to what is being said and perhaps further clarify an unclear thought. Finally, it can help you understand the strength, or more often weakness, of a person's argument. If he misused the word, you can now engage in dialogue, debate, conversation, and even criticism. A word on criticism: I do not use this word in the sense of your wife, husband, father, mother, or boss nagging at you (or you nagging at them). Criticism in the intellectual world involves exchange and testing of ideas, skepticism, challenge, and response, and ultimately a better understanding of the problem or situation at hand. That sounds like something military professionals should engage in, does it not? Finally, you may get to a point where you actually *enjoy* running across a big word precisely because you have mastered enough of them that running across one becomes a rarity.

Bottom line (which is what I am told majors and lieutenant commanders crave): going after all those big words is an *opportunity*, not an occasion for "feeling stupid" or being made to feel stupid by someone else. It is a great way to develop critical thinking and expand your vocabulary. Smart officers learn big words even if they would not speak or write them. But do use with care.

Dr. John T. Kuehn
General William Stofft Chair for Historical Research
U.S. Army Command and General Staff College

call for entries

for the

2015 Secretary of Defense and
2015 Chairman of the Joint Chiefs of Staff

Essay Competitions

Are you a professional military education (PME) student? Imagine your winning essay published in a future issue of *Joint Force Quarterly*, catching the eye of the Secretary and Chairman as well as contributing to the debate on an important national security issue. These rewards, along with a monetary prize, await the winners.

Who's Eligible? Students, including international students, at U.S. PME colleges, schools, and other programs, and Service research fellows.

What's Required? Research and write an original, unclassified essay on some aspect of U.S. national, defense, or military strategy. The essay may be written in conjunction with a course writing requirement. Important: Please note that entries must be selected by and submitted through your college.

When? Anytime during the 2014–2015 academic year. Students are encouraged to begin early and avoid the spring rush. Colleges set their own internal deadlines, but must submit their official entries to NDU Press by April 17, 2015, for the first round of judging. Final judging and selection of winners take place May 14–15, 2015, at NDU Press, Fort McNair, Washington, DC.

National Defense University Press conducts the competition with the generous support of the NDU Foundation. For further information, see your college's essay coordinator or go to:

http://ndupress.ndu.edu/EssayCompetitions/SECDEFCompetition.aspx
http://ndupress.ndu.edu/EssayCompetitions/CJCSCompetition.aspx

Chairman talks to Reserve Officers' Training Corps cadets at University of Notre Dame, September 2014 (DOD/Daniel Hinton)

From the Chairman
The Posture Paradigm

For the first half of my 40 years in the military, we were largely a *readiness*-focused force. We deployed for exercises and demonstrations to send signals to the Soviet Union and to reassure allies. Certainly, we had forces forward based in Europe and the Pacific. But mostly we trained our forces in the continental United States, building readiness in case we had to fight "the big one."

After the Berlin Wall fell and the Iron Curtain was furled in 1991, we reevaluated the cost and size of our military and changed our readiness-focused paradigm to a *presence*-focused one. Now the greater good was in avoiding conflict—shaping, assuring, and deterring through forward presence. As soon as a Service had a unit ready, it deployed and it went someplace. The general mindset was that if we did not use it, we did not need it.

Today, with the number of complex global security issues we face growing and with resources shrinking, neither of these paradigms is adequate. A Joint Force with global responsibilities and finite resources must prioritize threats and balance today's risks with tomorrow's uncertainty.

This is not to suggest we must "do more with less." Rather, in the highly dynamic security environment that we operate in, we must adapt how we lead, engage, and posture around the world in a way that is more strategic and more sustainable.

A More Agile Force

In developing strategy, we have stated that in the face of constrained resources, we are going to be more *agile* and more *innovative*. As we unpack these words, we challenge ourselves to see just how agile we currently are and identify innovative opportunities to become even more so. We can certainly improve our agility in decisionmaking; we tend to be very agile in a crisis but not as agile in our daily operations and long-range planning. We also need to be more agile

First Brigade Combat Team, 1st Cavalry Division, Soldiers review attack plan with Moldovan soldiers before situational training exercise at Hohenfels Training Area, Germany, October 2014 (U.S. Army/ Sarah Tate)

in the ways we manage our forces—that is, how we dynamically and purposefully employ assets around the globe. We must better identify opportunities that generate the greatest advantages and results using the right tools, in the right places, and with the right partners.

Most of our Joint Force works in either the realm of combatant commands or of the military Services. There is always tension managing the force. The combatant commands tend to want as much forward-positioned force structure as possible not only to shape, deter, and assure and but also to "fight tonight" if required. The Services want to support the demand, but they also have a responsibility to sustain the readiness and health of the force. This is a healthy tension in my view, but one that can get out of balance.

Becoming more agile requires finding sustainable ways to manage the global force to deter adversaries and reassure allies while not destroying readiness. Concurrently, it means giving the combatant commands a clear understanding of what is possible in terms of resources, balanced with the needs of the Services to maintain a healthy force, as well as constantly assessing risk to mission and risk to force.

A More Dynamic Global Operating Model

As we look back at the assumptions underlying the balance in our force posture since the end of the Cold War, it is clear our global posture is not—and should not be—immutable. Nor is it one size fits all. Posture evolves over time and should change to adapt to the global security environment and the threats that we face.

Accordingly, we are in the process of adapting our global force management mechanism from strictly demand-based to something more resource-informed, thereby allowing the Joint Force to protect U.S. national security interests in ways that are different, more deliberate, and more sustainable.

At its core, this means determining the proper mix between *forward-presence forces* in geographic combatant commands and *surge forces* based in the continental United States and U.S. territories. We have kept an eye focused on forward, highly ready forces in part because we have grown accustomed to the big payoff. But now we have to reconsider our "stance" to ensure we maintain our "balance."

This we know: our Joint Force must be able to dynamically reconfigure and move rapidly, integrating capabilities and partners across domains and boundaries not only to respond to emerging events, but also to surge ready forces from the continental United States or among geographic theaters to seize and maintain the initiative.

The details of how we are going to do this are very much part of the ongoing dialogue. We are discussing how to baseline theater presence, we are determining what innovative ways we can apply to maintain forward presence as we rebuild our readiness, and we are thinking about how best to prioritize capabilities to preserve flexibility. Any choices in these areas must improve our ability to seize opportunities that demonstrate U.S. leadership and strength to allies, partners, and adversaries.

I encourage you to become a part of this dialogue. The decisions we make now will define our future for decades to come, both in terms of how we react to crises and how we can help shape the international environment. JFQ

Martin E. Dempsey
General, U.S. Army
Chairman of the Joint Chiefs of Staff

Old Amphitheater at Arlington National Cemetery (DOD)

Where Do We Find Such Men and Women?

The title of this article is a slightly edited sentence from James Michener's 1953 novella *The Bridges at Toko-Ri.* On December 17, 1777, General George Washington recruited former Prussian officer Baron Friedrich Wilhelm Von Steuben to strengthen professionalism in the Colonial Army. Von Steuben then wrote a manual outlining the duties and responsibilities of the noncommissioned officer (NCO). In essence, this hallmark document was the creation of the NCO in the U.S. Armed Forces. This article is about one of those NCOs.

To fully understand the significance of this event, we must go back 153 years to April of 1861. Our nation is divided and has fallen into civil war. James R. Tanner, a 17-year-old farm boy from Richmondville, New York, enlists in Company C of the 87th New York Volunteer Infantry Regiment. Through his steadfast dedication and incredible performance, he is rapidly promoted to the rank of corporal. Over the course of the next 16 months, he would see action in nine major battle campaigns. His last battle would be the Second Battle of Bull Run in August of 1862. When a Confederate artillery shell hit his position, he sustained massive shrapnel wounds that required surgeons to amputate both of his legs below the knees.

Due to his injuries, Corporal Tanner was left behind when the Union Army moved on, and he was ultimately captured by Confederate forces. After being paroled, he spent weeks recovering before finally being sent home. His time in the Army was finally over. However, his commitment to service was not. Undaunted by the loss of his legs, he learned to walk with artificial limbs and navigated through life continuing to serve the Nation.

Corporal Tanner, as he would be known for the rest of his life, began his civil service as a deputy door keep for the New York State Assembly. During this time, he studied and became proficient

in stenography, a skill that would soon prove critical. On April 14, 1865, while working as a clerk and stenographer for the Ordnance Department in Washington, DC, Tanner was summoned to the bedside of the critically wounded President Abraham Lincoln. During the course of the night, he meticulously recorded the eyewitness accounts of the shooting of the President. Tanner was present in the room when Lincoln finally succumbed to his wounds.

Shortly afterward, Corporal Tanner left the Ordnance Department and began working as a committee clerk for the New York State Legislature. He later moved on to the New York Customs House and eventually was promoted to deputy customs collector. Tanner finished his civil service as the tax collector for Brooklyn and become an important public speaker on behalf of fellow veterans. Eventually Tanner opened a private legal practice dedicated to the defense of veterans. In April 1904, he was appointed by President Theodore Roosevelt as the Register of Wills for the District of Columbia, a position he held until his death in 1927.

Though employed in a full-time capacity, it was not enough. Corporal Tanner did not just continue to serve his nation through civil service; he dedicated much of his time to various veteran organizations. Tanner served as a member of the Grand Army of the Republic, an association for Union Army veterans. He was elected as the commander for the New York chapter and ultimately served as national commander. He was also a member of the Union Veteran Legion and went on to serve as its national commander as well. While a serving member of the Grand Army of the Republic, Tanner was the driving force behind the establishment of a Soldier's Home in Bath, New York, and later, a Confederate veteran's home in Richmond, Virginia.

Around this same time, Tanner became an active member of the newly founded American Red Cross. His efforts saw him elected to the board of directors. Through his tenacity and hard work, Tanner would champion the Red Cross in its reorganization and ultimately to a

(Photo courtesy of Michael R. Patterson)

Congressional Charter. Tanner lived a remarkable life, and upon his death in 1927 was buried in Arlington National Cemetery, just a few yards from the Old Amphitheater.

Though this article highlights Corporal Tanner in particular, it is important for the reader to know a little about the Old Amphitheater. It was erected in 1873 to serve as a location for patriotic meetings in celebration of Decoration Day (later renamed Memorial Day), which had been established in 1868. The amphitheater was first used on May 30, 1873, and remained in use until the early 1900s when it became evident that the popularity of the events dictated that a new, larger venue was needed. In 1920, the current Memorial Amphitheater was christened, and the original structure became informally known as the Old Amphitheater.

Ninety-four years after assuming the *Old* moniker, the amphitheater was formally renamed in recognition of a Civil War veteran who spent his life dedicated to civil service and advocating for his fellow veterans. This Soldier can be described as the epitome of professionalism, courage, patriotism, and more of what our current NCO corps traditionally represents: leadership, selfless sacrifice, and a lifelong commitment to the Nation. The amphitheater began its service as a gathering place for the remembrance of the selfless actions and honorable deeds of all our veterans. Who qualifies more than Corporal James Tanner, U.S. Army, to represent our veterans? In an effort to fully recognize the actions and service of Corporal Tanner, the leadership of Arlington National Cemetery proudly renamed the "Old" Amphitheater as the James Tanner Amphitheater on May 30, 2014.

Stop, if only for a moment, and remember those whose footsteps we have followed, those who dedicated their lives to service. Consider, too, the title of this article. It is a slightly edited sentence from James Michener's 1953 novella *The Bridges at Toko-Ri.* In a 1982 radio address, President Ronald Regan asked this same question and answered it thus: "we find [such men and women] where we've always found them. They are the product of the freest society man has ever known. They make a commitment to the military—make it freely, because the birthright we share as Americans is worth defending." Next Memorial Day, visit the James Tanner Amphitheater at Arlington in honor of all those noncommissioned officers who have served the greatest fighting force in the world. **JFQ**

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Senior Enlisted Advisor to the
Chairman of the Joint Chiefs of Staff
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U.S. Air Force Captain Erica Stooksbury, a C-17 Globemaster III aircraft pilot with the 816th Expeditionary Airlift Squadron, adjusts cockpit lighting controls in C-17 over Iraq, August 2014 (DOD/Vernon Young, Jr.)

Executive Summary

As we reach the end of U.S. combat operations in Afghanistan, the American joint force is closing one chapter but seemingly opening another. The rapid change of events in Iraq and the ongoing civil war in Syria cannot help but make us wonder if we are perpetually at war. I teach a class at the Eisenhower School on war termination, and despite the many and varied examples of how wars terminate (or not), the "school solution" is ever elusive. We seem to be somewhere between the near certainty of the geometric concepts of Antoine-Henri Jomini and the "it depends" school of such greats as Carl von Clausewitz as we seek to understand both the wars we are in and those we might face in the future.

In a recent Veteran's Day speech at Georgetown University, Lieutenant General H.R. McMaster, USA, repeated an important thought for those who believe that military officers *study* war in order to *create* war. General McMaster told the audience that military officers are expected first "to study war as the best means of preventing it; and second, to help the American military preserve our warrior ethos while remaining connected to those in whose name we fight." His view, which all who serve should share, is that the study of war allows officers to understand the costs in blood and treasure before recommending how to respond to threats or actual attacks when asked by civilian leaders. This is not a new requirement for military officers, but is increasingly seen as important for civilians involved in decisionmaking on the use of armed forces in war.

Joint Force Quarterly is here in part to support the idea that the study of war and all of its elements is essential to learning how to avoid war if at all possible, and to successfully and rapidly conclude combat operations as soon as practical and in a fashion that enables transition to a peaceful postconflict situation. This is the fundamental reason why Service and joint professional military education (JPME) schools, their curricula, and their faculty and staffs exist. Moreover, this is the reason General Colin Powell created this journal over 20 years ago: to spur an open debate on issues important to the joint force. Without these platforms to support learning, the intellectual power of the men and women involved in

recommending military options would be greatly diminished.

An important part of the successful accomplishment of this education mission is you, the reader. You can do more to foster the study of war and promote the warrior ethos simply by reading, sharing, discussing, and, if so inclined, writing for this journal. Our mission supports your efforts to become better educated and to achieve a higher level of understanding and capability as part of the human dimension of the military.

In this issue's Forum section, Chief of Naval Operations (CNO) Admiral Jonathan Greenert returns with his view on how the Navy does its part to achieve successful joint force interdependence. Of course, no single Service can sustain operations independent from the others, and in the CNO's view, the Services must strive to work out the best ways to succeed together. Another continuing area of interest for the joint force is how to deal with emerging concerns over the potential for open warfare in space. James Finch helps us see the connections between space activity and strategic calculations of the major powers on the ground.

As I write this essay, the National Defense University (NDU) has just gained its 15th president, Major General Frederick M. Padilla, USMC, and the pace of joint professional military education continues fast and furious. So too is the pace of article submissions in the JPME arena, and the downloads from our *JFQ* Web site indicate that JPME Today has become one of the journal's most popular sections. First, Burton Catledge analyzes what it takes to spur innovation with a surprise for some: it is not technical competency alone that makes it happen. Nikolas Gvosdev next provides a strong argument for the inclusion of policy analysis in professional military education. Those of us who have been subjected to advanced statistics courses in our academic careers are familiar with the standard caution that "correlation is not necessarily causality." Andrew Stigler helps us work through what causality means, especially in national security issues. Adding the "what next" to the ongoing discussion of transformation in JPME, Christopher Lamb and Brittany Porro suggest how to complete the transformation effort at NDU and provide a range of options for all PME institutions to consider.

As you read the first article in the Commentary section on the topic of diversity in the joint force, you will see beyond the four-star rank of the author and simply see the power of his words. Working through the various social changes in the force, General Larry Spencer's words become even more powerful as a means to get from good to great. William Marcellino brings us a different take on strategic communications, suggesting a new way to make it work by taking advantage of the fields of rhetoric and discourse analysis instead of the current focus on communications theory, public relations, and marketing. Continuing a robust discussion of all things cyber in this journal during my tenure, J. Marcus Hicks offers his perspective on the subject that adds some geographic context to one of the Chairman's seven security issues (see General Martin Dempsey's remarks at the Atlantic Council on May 14, 2014). As a side note, these seven issues and especially a focus on cyber have been an integral part of this year's curriculum here at National Defense University. *JFQ* is interested in all of these issues, and I hope potential authors who read about them will take advantage.

Leading off our Features section, Linnea Duvall and Evan Renfro provide some interesting ideas on how to adjust our national strategic security perspective from a reliance on Cold War deterrence thinking to a more nuanced conflict management approach. Ofer Fridman brings us back to the nonlethal weapons discussion we had a number of issues ago by suggesting that we need to better refine our requirements. As this issue hits the streets, U.S. combat operations in Afghanistan are coming to an end, spurring many efforts to capture the "best practices" from our decade-plus of war. Along these lines, Robert Mabry outlines the challenges in improving the record-setting advancements in combat casualty survival rates from these wars.

Quick quiz: which disease has had as much as an 80 percent infection rate among deployed U.S. forces? Hint: the disease is generally more widespread and deadly than all other viral hemorrhagic fevers combined, including Ebola, Marburg, Lassa, Korean, and Crimean-Congo, as well as the deadly Yellow Fever. Mary Raum and Kathleen McDonald tell us the answer: dengue, for which there is no cure except to kill the mosquitoes that carry it. They suggest that a campaign to eradicate these deadly carriers would be fairly inexpensive and align perfectly with combatant command "shaping" efforts in affected areas. This article should be mandatory reading for those serving in or headed for U.S. Pacific Command and U.S. Africa Command.

If you are looking for a way to be published in *JFQ* where the competition is not as fierce, try a history piece that relates to jointness. *JFQ* gets relatively few submissions in this area, but nearly all of them fit our Recall section. In this issue's Recall, Del Kostka adds a great review of the combined campaign in 1943 to eject Japanese forces from the Aleutian Islands in Alaska. Never heard of this operation? Read on, as there is joint and combined knowledge to be gained in these pages.

Also in this issue, we have three excellent book reviews, as well as the Joint Staff J7 joint doctrine update and an important essay by Geoffrey Weiss on the Defense Department's vision for integrated air and missile defense.

As you work your way through this issue, consider whether you agree with the arguments. Think about what these ideas can do for your situation or that of your organization. We are interested in your views on these or any other topic related to the joint force. What separates successful organizations from the rest is the degree to which the people in them learn and grow intellectually. *JFQ* offers you the chance to learn about your profession and at the same time help others learn what you know. That is a critical component of the warrior ethos, helping others learn. Let us know what you think. **JFQ**

William T. Eliason
Editor in Chief

Airmen working on Distributed Ground Station–1 Operations Floor at the U.S. Air Force's 480th Intelligence, Surveillance, and Reconnaissance Wing (U.S. Air Force)

Navy Perspective on Joint Force Interdependence

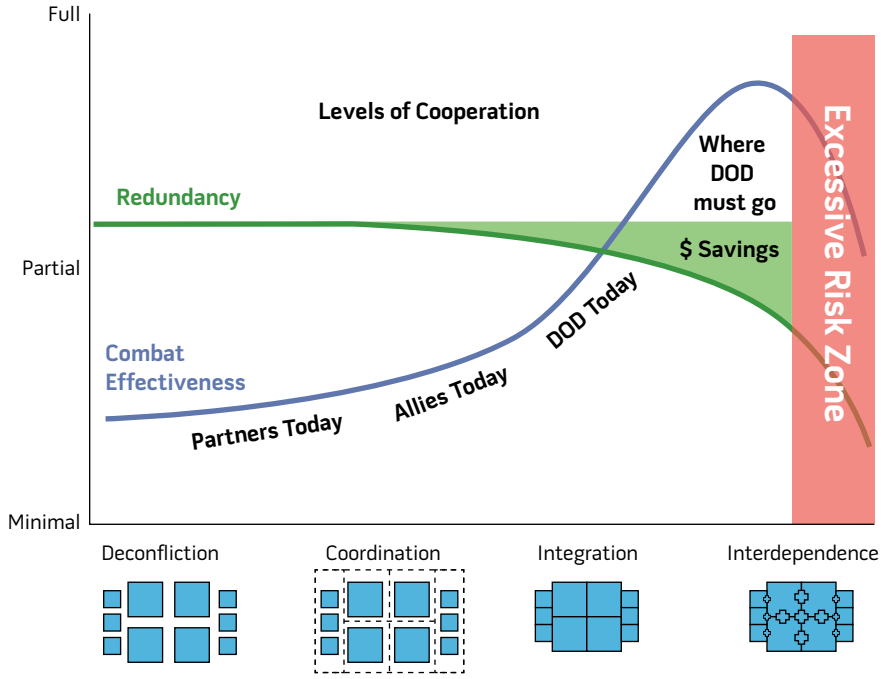
By Jonathan Greenert

Looking ahead to the Department of Defense's (DOD's) fiscal prospects and security challenges in the second half of this decade and beyond, the Services and their partners will have to find ever more ingenious ways to come together. It is time for us to think and act in a more ecumenical way as we build programs and capabilities. We should build stronger ties, streamline intelligently, innovate, and wisely use funds at our disposal. We need a broader conversation about how to capitalize on each Service's strengths and "domain knowledge" to better integrate capabilities. Moving in this direction is not only about savings or cost avoidance; it is about better warfighting.

The DOD historical track record shows episodic levels of joint deconfliction, coordination, and integration. Wars and contingencies bring us together. Peacetime and budget pressures seem to compel the Services to drift apart, and more dramatic fiscal changes can lead to retrenchment. While Service rivalries are somewhat natural, and a reflection of esprit de corps, they are counterproductive when they interfere with combat performance, reduce capability for operational commanders, or produce unaffordable options for the Nation. Rather than expending our finite energy on rehashing roles and missions, or committing fratricide as resources become constrained, we should find creative ways to build and strengthen our connections. We can either come together more to

Admiral Jonathan Greenert is Chief of Naval Operations.

Figure. "Smart Interdependence" Improves Warfighting and Fiscal Responsibility



preserve our military preeminence—as a smaller but more effective fighting force, if necessary—or face potential hollowing in our respective Services by pursuing duplicative endeavors.

Unexplored potential exists in pursuing greater *joint force interdependence*, that is, a deliberate and selective reliance and trust of each Service on the capabilities of the others to maximize its own effectiveness. It is a mutual activity deeper than simple "interoperability" or "integration," which essentially means pooling resources for combined action. Interdependence implies a stronger network of organizational ties, better pairing of capabilities at the system component level, willingness to draw upon shared capabilities, and continuous information-sharing and coordination. Chairman of the Joint Chiefs of Staff General Martin Dempsey notes, "The strength of our military is in the synergy and interdependence of the Joint Force." Many capstone documents emphasize greater interdependency between the Services' structures and concepts including the *Chairman's Strategic Direction to the Joint Force*, which calls for "combining capabilities in innovative ways."

These concepts ring true for the maritime Services. The Navy–Marine Corps team has operated interdependently for over two centuries. Symbiotic since their inceptions, Marines engaged in ship-to-ship fighting, enforced shipboard discipline, and augmented beach landings as early as the Battle of Nassau in 1776. This relationship has evolved and matured through the ages as we integrated Marine Corps aviation squadrons into carrier air wings in the 1970s, developed amphibious task force and landing force doctrines, and executed mission-tailored Navy–Marine Corps packages on global fleet stations. Land wars over the last decade have caused some of the cohesion to atrophy, but as the Marines shift back to an expeditionary, sea-based crisis response force, we are committed to revitalizing our skills as America's mobile, forward-engaged "away team" and "first responders." Building and maintaining synergy is not easy; in fact, it takes hard work and exceptional trust, but the Navy and Marine Corps team has made it work for generations, between themselves and with other global maritime partners.

The Services writ large are not unfamiliar with the notion of cross-domain synergy. Notable examples of historical interdependence include the B-25 Doolittle Raid on Tokyo from the USS *Hornet* in 1942 and the Army's longest ever helicopter assault at the start of Operation *Enduring Freedom* from the USS *Kitty Hawk*. The Navy has leaned heavily on Air Force tankers for years, and B-52s can contribute to maritime strikes by firing harpoons and seeding maritime mines. Likewise, other Services have relied on Navy/Marine Corps EA-6B aircraft to supply airborne electronic warfare capabilities to the joint force since the 1990s—paving the way for stealth assets or "burning" routes to counter improvised explosive devices. Examples of where the Navy and Army have closely interfaced include Navy sealift and prepositioning of Army materiel overseas, ballistic missile defense, the Army's use of Navy-developed close-in weapons systems to defend Iraq and Afghanistan forward operating bases, and the use of Army rotary-wing assets from afloat bases. Special operations forces (SOF) come closest to perfecting operational interdependence with tight, deeply embedded interconnections at all levels among capability providers from all Services.

Opportunities exist to build on this foundation and make these examples the rule rather than the exception. We must move from transitory periods of integration to a state of smart interdependence in select warfighting areas and on Title 10 decisions where natural overlaps occur, where streamlining may be appropriate and risk is managed. From my perspective, advancing joint force interdependence translates to:

- avoiding overspending on similar programs in each Service
- selecting the right capabilities and systems to be "born joint"
- better connecting existing tactics, techniques, procedures, concepts, and plans
- institutionalizing cross-talk on Service research and development, requirements, and programs
- expanding operational cooperation and more effective joint training and exercises.

USS *Freedom*, Littoral Combat Ship 1 (U.S. Navy/Tim D. Godbee)

USS *Independence*, Littoral Combat Ship 2 (U.S. Navy/Carlos Gomez)

The Air-Sea Battle (ASB) concept, and the capabilities that underpin it, represent one example of an opportunity to become more interdependent. While good progress has been made on developing the means, techniques, and tactics to enable joint operational access, we have much unfinished business and must be ready to make harder tradeoff decisions. One of the principles of ASB is that the integration of joint forces—across Service, component, and domain lines—begins with force development rather than only after new systems are fielded. We have learned that loosely coupled force design planning and programming results in costly fixes. In the pursuit of sophisticated capability we traded off interoperability and are now doing everything we can to restore it, such as developing solutions for fifth-generation fighters to relay data to fourth-generation ones. ASB has become a forcing function to promote joint warfighting solutions earlier in the development stage. For example, the Navy and Army are avoiding unaffordable duplicative efforts by teaming on the promising capabilities of the electromagnetic railgun, a game-changer in defeating cruise and ballistic missiles afloat and ashore using inexpensive high-velocity projectiles.

Additional areas where interdependence can be further developed include the following.

Innovative Employment of Ships. The Navy–Marine Corps team is already developing innovative ways to mix expeditionary capabilities on combatants and auxiliaries, in particular joint high speed vessels, afloat forward staging bases, and mobile landing platforms just starting to join the force. We see opportunities to embark mission-tailored packages with various complements of embarked intelligence, SOF, strike, interagency, and Service capabilities depending on particular mission needs. This concept allows us to take advantage of access provided by the seas to put the right type of force forward—both manned and unmanned—to achieve desired effects. This kind of approach helps us conduct a wider range of operations with allies and partners and improves our ability to conduct persistent distributed operations across all domains to increase sensing, respond more quickly and effectively to crises, and/or confound our adversaries.

Mission-tailored packages for small surface combatants such as the littoral combat ship, and the Navy's mix of auxiliaries and support ships, would enable them to reduce the demand on large surface combatants such as cruisers and destroyers for maritime security, conventional deterrence, and partnership-building missions. We cannot afford to tie down capital ships in missions that demand only a small fraction of their capabilities, such as contracted airborne intelligence, surveillance, and reconnaissance (ISR) services from Aegis destroyers. We are best served tailoring capability to need, interchanging platforms and their payloads suitable to the missions that they are best designed for. At the end of the day, it is about achieving economy of force.

To make these concepts real, the Navy would support an expanded joint effort to demonstrate roll-on, roll-off packages onto ships to create a set of specialized capability options for joint force commanders. Adaptive force packages could range from remote joint intelligence collection and cyber exploit/attack systems, SOF, modularized Army field medical units, humanitarian assistance/disaster relief supplies and service teams, to ISR detachments—either airborne,

surface, or subsurface. Our ships are ideal platforms to carry specialized configurations, including many small, autonomous, and networked systems, regardless of Service pedigree. The ultimate objective is getting them forward and positioned to make a difference when it matters, where it matters.

Tightly Knitted ISR. We should maximize DOD investments in ISR capabilities, especially the workforce and infrastructure that supports processing, exploitation, and dissemination (PED). SOF and the Air Force are heavily invested in ISR infrastructure, the Army is building more reachback, and the Navy is examining its distribution of PED assets between large deck ships, maritime operations centers, and the Office of Naval Intelligence. While every Service has a responsibility to field ISR assets with sufficient "tail" to fully optimize their collection assets, stovepiped Service-specific solutions are likely too expensive. We should tighten our partnerships between ISR nodes, share resources, and maximize existing DOD investments in people, training, software, information systems, links/circuits, communications pipes, and processes. To paraphrase an old adage, "If we cannot hang together in ISR, we shall surely hang separately."

ISR operations are arguably very "purple" today, but our PED investment strategies and asset management are not. Each Service collects, exploits, and shares strategic, anticipatory, and operational intelligence of interest to all Services. In many cases, it does not matter what insignia or fin flash is painted on the ISR "truck." Air Force assets collect on maritime targets (for example, the Predator in the Persian Gulf), and Navy assets collect ashore (the P-3 in Operations *Iraqi Freedom* and *Enduring Freedom*). Yet each Service still develops its own particular PED solutions. We should avoid any unnecessary new spending where capability already exists, figure out dynamic joint PED allocation schemes similar to platform management protocols, and increase the level of interdependency between our PED nodes. Not only is this approach more affordable, but it also makes for more effective combat support.

(Top) USNS *Lewis B. Puller,* Mobile Landing Platform–3/Afloat Forward Staging Base–1, under construction at General Dynamics National Steel and Shipbuilding Company shipyard; (below) artist's conception of MLP/AFSB with departing V-22 Osprey (U.S. Navy/Courtesy General Dynamics NASSCO)

We can also be smarter about developing shared sensor payloads and common control systems among our programmers while we find imaginative ways to better work the ISR "tail." Each Service should be capitalizing on the extraordinary progress made during Operations *Iraqi Freedom* and *Enduring Freedom* in integrating sensors, software, and analytic tools. We should build off those models, share technology where appropriate, and continue to develop capability in this area among joint stakeholders.

Truly Interoperable Combat and Information Systems. The joint force has a shared interest in ensuring sufficient connectivity to effect information-sharing and command and control in all future contingencies. We cannot afford to develop systems that are not interconnected by design, use different data standards/formats, come without reliable underlying transport mechanisms, or place burdens on our fielded forces to develop time-consuming workarounds. We still find DOD spending extraordinary time and effort healing itself from legacy decisions that did not fully account for the reality that every platform across the joint community will need to be networked.

Greater discipline and communication between planners, programmers, acquisition professionals, and providers for information systems at all classification levels are required. We must view all new information systems as part of a larger family of systems. As such, we should press hard to ensure convergence between the DOD Joint Information Environment and the Intelligence Community's Information Technology Enterprise initiatives. Why pay twice for similar capabilities already developed somewhere else in the DOD enterprise? Why would we design a different solution to the same functional challenge only because users live in a different classification domain? Ensuring "best of breed" widgets, cloud data/storage/utility solutions, advanced analytics,

Newest naval platforms include Joint High Speed Vessel, Mobile Landing Platform, and Landing Craft Air Cushion (U.S. Navy)

and information security capabilities are shared across the force will require heightened awareness, focused planning, inclusive coordination, and enlightened leadership for years to come.

In the world of information systems, enterprise solutions are fundamentally interdependent solutions. They evolve away from Service or classification domain silos. We are not on this path solely because we want to be thriftier. Rationalizing our acquisition of applications, controlling "versioning" of software services, reducing complexity, and operating more compatible systems will serve to increase the flow of integrated national and tactical data to warfighters. This, in turn, leads to a better picture of unfolding events, improved awareness, and more informed decisionmaking at all levels of war. Enterprise approaches will also reduce cyber attack "surfaces" and enable us to be more secure.

In our eagerness to streamline, connect, and secure our networks and platform IT systems, we have to avoid leaving our allies and partners behind. Almost all operations and conflicts are executed as a coalition; therefore, we must develop globally relevant, automated, multilevel information-sharing tools and update associated policies. This capability is long overdue and key to enabling quid pro quo exchanges. Improved information-sharing must become an extensible interdependency objective between joint forces, agencies, allies, and partners alike. Improving the exchange of information on shared maritime challenges continues to be a constant refrain from our friends and allies. We must continue to meet our obligations and exercise a leadership role in supporting regional maritime information hubs such as Singapore's Information Fusion Center, initiatives such as Shared Awareness and Deconfliction (SHADE) designed for counterpiracy, and other impromptu coalitions formed to deal with unexpected crises.

Other fields to consider advancing joint force interdependence include cyber and electromagnetic spectrum capabilities, assured command and control (including resilient communications), ballistic missile defense, and directed energy weapons.

To conclude, some may submit that "interdependence" is code for "intolerable sacrifices that will destroy statutory Service capabilities." I agree that literal and total interdependence could do just that. A "single air force," for example, is not a viable idea. Moreover, each branch of the military has core capabilities that it is expected to own and operate—goods, capabilities, and services no one else provides. As Chief of Naval Operations, I can rely on no other Service for sea-based strategic deterrence, persistent power projection from forward seabases, antisubmarine warfare, mine countermeasures, covert maritime reconnaissance and strike, amphibious transport, underwater explosive ordnance disposal, diving and salvage, or underwater sensors, vehicles, and quieting. I cannot shed or compromise those responsibilities, nor would I ask other Services to rush headlong into a zone of "interdependence" that entails taking excessive risks.

Joint interdependence offers the opportunity for the force to be more efficient where possible and more effective where necessary. If examined deliberately and coherently, we can move toward smarter interdependence while avoiding choices that create single points of failure, ignore organic needs of each Service, or create fragility in capability or capacity. Redundancies in some areas are essential for the force to be effective and should not be sacrificed in the interest of efficiency. Nor can we homogenize capabilities so far that they become ill suited to the unique domains in which the Services operate.

Over time, we have moved from deconflicting our forces, to coordinating them, to integrating them. Now it is time to take it a step further and interconnect better, to become more interdependent in select areas. As a Service chief, my job is to organize, train, and equip forces and provide combatant commanders maritime capabilities that they can use to protect American security interests. But these capabilities must be increasingly complementary and integral to forces of the other Services. What we build and how we execute operations once our capabilities are fielded must be powerful and symphonic.

Together, with a commitment to greater cross-domain synergy, the Services can strengthen their hands in shaping inevitable force structure and capability tradeoff decisions on the horizon. We should take the initiative to streamline ourselves into a more affordable and potent joint force. I look forward to working to develop ideas that advance smart joint interdependence. This is a strategic imperative for our time. **JFQ**

Flying over East Asia, Expedition 38 crewmember on International Space Station took this night image of the Korean Peninsula (NASA)

Bringing Space Crisis Stability Down to Earth

By James P. Finch

Tensions in the South and East China seas have been elevated during the last year. Territorial disputes in these areas flare periodically, but historically the brinkmanship has largely been confined to encounters at sea, with maritime law enforcement vessels confronting fishing fleets as traditional naval forces lurk just over the horizon. Given that the objects of these political disputes are islands, shoals, and the vast resources around and beneath them, it is only natural that the armed instruments of power brought to bear would operate in close proximity to the territory in question.

China's unilateral expansion of its air defense identification zone (ADIZ) appears to have introduced a new and dangerous element into the situation. While such zones are not new, the unilateral extension of one country's ADIZ to overlap with another country's ADIZ, with no prior consultation and over politically disputed territory, necessarily breeds suspicion and rancor. Moreover, the duplication sets the stage for misperception and miscalculation, with each party refusing to recognize the legitimacy of the declared defense interests of the other.

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Although much is being written about the ADIZ, the expansion of the political dispute from the seas to the skies portends an additional evolution of a future political crisis—a jump to the heavens. Just as analysts are closely scrutinizing the repercussions of the competing ADIZs on strategic and crisis stability between the claimants, we would be wise to begin thinking about the implications for strategic stability if future crisis escalations involve the space domain. It is far easier to dispassionately consider implications of such a jump before it occurs, when analysis can occur free of the politically charged suspicions that follow the horizontal escalation of a crisis into a new domain.

A discussion about the political import of space cannot occur as if space were somehow abstracted from the terrestrial political situation or, in the case of nuclear-armed powers, abstracted from nuclear or strategic stability. Just as the expansion of the ADIZ must be considered within the context of the political dispute over the territory beneath it, so too must space power be understood in the context of the political objectives here on Earth that gave rise to the crisis. Important, too, is the overall stability of the strategic situation, and our understanding of such stability must not somehow be artificially separated from what is happening or could happen in the heavens. Understanding how space fits into strategic stability, and how actions in space can affect, or even drive, crisis dynamics, is imperative to reduce the risk of miscalculation.

Giving Meaning to Strategic Stability

Over the past 5 to 10 years, it has become common to focus on "strategic stability" as the new modus vivendi between great powers. Before exploring the synergies of space and strategic stability, it is important to settle on a workable definition of *strategic stability*. In many ways, for those not schooled in nuclear strategy, this term has come to replace "mutually assured destruction" in defining the relationship between potentially adversarial nuclear powers. Precise definitions of strategic stability vary, and the U.S. Army War College highlighted this point in a recent volume of essays that explore various aspects of competing interpretations.[1] Understanding the concept of strategic stability is an excellent foundation, yet by its focus on nuclear weapons it largely overlooks the critical role of the space domain.

The focus on nuclear weapons at the expense of space power in strategic stability literature is understandable. For the four-plus decades of the Cold War, nuclear weapons were the coin of the strategic realm. As both sides fielded space systems during this period, the safety of satellites was maintained by their close linkage to nuclear force structures. In peacetime, space systems provided reassurance that the other party was not massing forces in threatening ways, while also providing technical insights that helped to verify arms control regimes. During crisis and wartime, space systems were designed to provide early warning of missile launches and to enable national leadership to execute nuclear warfighting plans. Space systems could also be called on to conduct battle damage assessment to confirm that nuclear weapons had detonated as planned and to order further attacks as needed. Given these roles and the connection to nuclear warfighting, decisionmakers in Washington (and perhaps Moscow) presumed that an attack on space assets would prefigure a nuclear confrontation. Thus, the problem of space deterrence, or crisis stability in space independent of nuclear stability, was uninteresting at best. Times have changed, and those concerned with understanding contemporary strategic stability would be well served to consider the synergistic effects of space warfare and crisis dynamics.

In one of the most insightful chapters of the Army War College volume, author Elbridge Colby states that "strategic stability should be understood to mean a situation in which no party has an incentive to use nuclear weapons save for vindication of its vital interests in extreme situations."[2] He goes on to assert that in "a stable situation, then, major war would only come about because one party truly sought it, not because of miscalculation."[3] Colby's insightful description not only applies to nuclear conflicts, but also can help advance our understanding of how space systems fit into broader notions of strategic stability, crisis stability, and arms race stability.

Importance of Space to Stability

Space is vital to the national security of the United States. As noted in the U.S. National Space Policy, space-based capabilities enable the Armed Forces to see with clarity, communicate with certainty, navigate with accuracy, and operate with assurance.[4] Maintaining the benefits afforded by space is also essential to economic growth and prosperity, both in the United States and around the world.

U.S. and allied forces rely on satellites to operate far from established terrestrial communications networks. Satellite communications provide the backbone to ensure that analysts and warfighters receive real-time access to intelligence, surveillance, and reconnaissance data streams provided by remotely piloted aircraft, which themselves are operated by pilots via satellite. The global positioning system provides forces critical position, navigation, and timing information, allowing the joint force to better understand the contours of the battlespace, target with precision, and synchronize effects. Space-based assets provide for global and theater missile warning, and assets operated by the Department of Defense and National Oceanic and Atmospheric Administration provide accurate, timely weather information. All of these capabilities are critical to the joint force in projecting power far from the homeland.

For an adversary seeking to disrupt or deny the ability of the United States to project power, space capabilities may provide an appealing target, especially early in a crisis or conflict. As such, space as a domain is inextricably linked to crisis stability. First, space capabilities are critical enablers for the joint force, and some have viewed these capabilities as an Achilles' heel for that force. Because a first strike against key space forces could undercut the ability of the rest of the

joint force to meet its operational and tactical objectives, it may be a tempting option. Second, many space capabilities can be degraded through electronic means, enabling the use of weapons systems such as jammers that an adversary might perceive as less escalatory. Just as China has found the use of civil "maritime law enforcement" ships to be less provocative than People's Liberation Army naval forces in maritime standoffs, so too an adversary may believe that jamming a spacecraft is less provocative than other means of purposeful interference. Finally, it is often said that "satellites have no mothers." Adversaries may therefore believe that they can attack such targets without fear of engendering strong public outcries that must be satisfied through some form of retaliation.

But focusing exclusively on the U.S. use of space systems misses a significant change in the larger environment—a change that will only become more pronounced in the coming decades. The United States is not alone in its growing reliance on space for political, economic, and military purposes. The unique attributes of the space domain—global coverage, persistence, access to denied areas—are attributes that are valuable to all societies and militaries irrespective of their political ideologies.

China is the best example of this trend, as that country's space program both mirrors and directly contributes to its overall modernization, military and otherwise. China has contributed to new challenges for traditional and emerging actors in space, such as through competition for commercial contracts to launch satellites and through China's antisatellite test in 2007 that created thousands of pieces of space debris. Yet it should be recognized that China also shares a common interest in the safety, stability, and security of the domain. President Barack Obama and then-President Hu Jintao agreed during one of their first meetings that "the two countries have common interests in promoting the peaceful use of outer space and agreed to take steps to enhance security in outer space."[5]

China, like the rest of the world, continues to derive significant economic benefit from space capabilities. And, like the United States, China has discovered the military benefits enabled by space. A critical feature of China's so-called antiaccess/area-denial strategy is the ability to engage an adversary's force at a distance. This is best accomplished by relying on the ultimate high ground of space. Space provides an ideal location to identify and target forces, to communicate with and guide weapons systems, and to assess damage after the strike.

Standard Missile–3 Block IB guided missile launched from USS *John Paul Jones* during Missile Defense Agency and U.S. Navy test over Pacific Ocean (Missile Defense Agency/Leah Garton)

For the past decade, the strategic community has thought of dependence on space systems and the accompanying vulnerability as a "U.S. problem." While this was accurate a decade ago, this problem increasingly confronts any modern state seeking to project power regardless of its political motivation. The implication of this development is profound, with wide-ranging potential effects for strategic stability. If both sides depend on space systems to ensure that military forces can

achieve political objectives (or deny the political objectives of an adversary), then the overall stability of the space domain will become a central component of the overall stability of a crisis.

Decisionmakers in a crisis must weigh the implications of accepting the status quo or seeking to alter it through the application of some element of power. In such a circumstance, a decisionmaker will evaluate the relative balance of forces at different levels of conflict and may be deterred by the likelihood of failure or the risks of unacceptable retaliation. If, however, it appears that an early strike can improve the odds of success or neutralize an adversary's ability to counter-escalate—for example, by denying critical space capabilities—the adversary's conclusion may be different and deterrence may fail. An effective deterrence strategy must balance across domains and elements of national power. The alternative is to risk that vulnerability in one narrow area, such as space, could collapse the threshold for deterrence failure more broadly.[6]

Simply put, strategic stability must be sought in space, and space stability must help maintain the overarching stability and deterrence posture here on Earth. Strategic and space stabilities are inextricably linked, and they are linked not only for the United States, but also increasingly for China and other countries that rely on space systems to achieve military and political objectives. For this reason, we must give serious attention to how to achieve and maintain crisis stability in space.

Crisis Dynamics and Space

As potentially dangerous as the overlapping ADIZs are, they are far less destabilizing than actions in space could be during a crisis. All contestants in the "great game" unfolding in Asia have fairly similar appreciations of the implications that would follow engaging military or, worse, civilian aircraft transiting their ADIZ. These understandings have been built over 100 years of air travel and were underscored dramatically in the miscalculation associated with the Soviet downing of Korean Air Lines Flight 007 in 1983.

Such shared understandings are largely nonexistent in space. Not only do nations have less experience operating in the domain, but the criticality of space systems to broader operational objectives also may create a tempting target early in a crisis. Combined with the lack of potential human casualties from engagements in space, this lack of common understanding may create a growing risk of miscalculation in a terrestrial political crisis. If not explicitly addressed, this instability in space could even create a chasm that undermines the otherwise well-crafted tenets of strategic or nuclear stability.

While much has been written about how nuclear weapons contribute to, or detract from, crisis stability, space, in some ways, is more complex than nuclear stability. First, today a clear taboo exists against the use of nuclear weapons. Crossing that firebreak at any level has immediately recognizable and significant implications. Second, in the context of nuclear weapons, theorists can (at least arguably) discriminate among escalatory motives based on the *type of weapon*—strategic or tactical—and based on the *type of target*—counterforce or countervalue targeting. This was most famously sketched out in the form of an escalation ladder in Herman Kahn's 1965 book, *On Escalation*.[7]

This convenient heuristic method for understanding escalation based on the target and the weapon type is arguably more complex for space. This is a byproduct of the lack of mutual understanding on the implications of the weapon and the value of the target. These factors deserve detailed consideration because they describe the playing field on which a terrestrial crisis could spiral into space conflict. Efforts to manage crises, therefore, must account for these complexities.

To begin, there is no taboo against many types of counterspace systems. Starting a framework with weapon type, the threshold for use of temporary and reversible counterspace weapons appears much lower. There are documented instances of electronic jamming happening all over the world today, and the number of actors who possess counterspace weapons such as communications jammers is much higher. Given the low cost and relative simplicity of some counterspace weapons, even nonstate actors have found utility in employing them. As former Deputy Secretary of Defense William Lynn noted, "Irregular warfare has come to space."[8] Consequently, this type of weapon—temporary and reversible—may appear at first glance to be less escalatory and less prone to miscalculation than kinetic weapons.

At the other end of the weapons spectrum are weapons that have permanent and irreversible effects. The extreme version of such a weapon would be a debris-generating kinetic kill device such as the kind that was tested by the United States and Soviet Union during the Cold War and by China in 2007. These weapons are particularly insidious because they generate large amounts of debris that indiscriminately threatens satellites and other space systems for decades into the future.

One additional dimension to the weapons spectrum that merits consideration in the context of crisis stability relates to the survivability of a weapon. It is commonly accepted that space is an offense-dominant domain, which is to say that holding space targets at risk is far easier and cheaper than defending them. This could lead to first-strike instability by creating pressure for early action at the conventional level here on Earth before counterspace attacks could undermine the capability for power projection. But the offense-dominant nature of the domain has implications for both peaceful satellites as well as space-based weapons. This could also create first-strike instability regarding space-based weapons since the advantage would go to the belligerents who use their space weapon first. In this way, space-based weapons may be uniquely destabilizing in ways that their more survivable, ground-based relatives are not.

Adding complexity to Kahn's heuristic, however, is the situational context surrounding the employment of counterspace systems. In the space context, strategists will have to consider weapon type, the nature of the target, and also the terrestrial context. Today's electronic jamming has primarily been witnessed

Views of zenith side of International Space Station over Lake Baikal in Russia, Mongolia, and China taken from *Atlantis*, Orbiter Vehicle 104, during STS-106 mission (NASA)

in the Middle East, where regimes have sought to deny freedom of information to their populations by jamming commercial communications satellites. The same weapon type—a satellite communications jammer—applied against a satellite carrying strategic nuclear command and control communications during a crisis could be perceived much differently. In such an instance, decisionmakers might conclude that the other side is attempting to deprive them of nuclear command and control as a prelude to escalation.

Similarly, the application of permanent, irreversible force against a commercial or third party satellite would have a much different effect on crisis dynamics than mere jamming. Physically destroying or otherwise rendering inoperable such assets could raise a party's stake in the conflict, by threatening either its power projection capabilities globally or its assured ability to retaliate against a nuclear strike. Many militaries use commercial assets to communicate with deployed forces, and a "show of force" strike against a commercial satellite could inadvertently engage an adversary's vital interests.

Simply put, the weapon, target, and context all contribute to the perceived intent and effects of a counterspace attack. Unlike in other domains, tremendous ambiguity exists regarding the use of counterspace weapons. This means that all of these variables would be open to interpretation in crises, and it should be remembered that an inherent characteristic of crises is a short timeframe for decisionmaking. When time is short and the potential cost of inaction is significant, or even catastrophic, decisionmakers tend to lean toward worst-case interpretations of an adversary's actions. This is a clear recipe for inadvertent miscalculation.

Bringing Space Down to Earth

The Cold War adversaries had many years to develop mutual understandings about the nature and role of nuclear weapons, and these understandings contributed to strategic stability. These understandings were born out of real-world crises, such as the Berlin crises, Korean War, and Cuban missile crisis.

Single modified tactical Standard Missile–3 launches from U.S. Navy Aegis cruiser USS *Lake Erie* (U.S. Navy)

They also emerged from dialogues, such as formal summits and long-running arms control negotiations. The former are certainly much more dangerous than the latter, and no one wants to see the space equivalent of a Cuban missile crisis.

There are signs of progress. The United Nations Group of Government Experts recently recommended bilateral and multilateral transparency and confidence-building measures. In addition, the European Union is leading open-ended consultations to develop an "International Code of Conduct for Outer Space Activities." While these measures will help promote the responsible use of space, they do not squarely address the current lack of mutual understanding regarding how space attacks will be perceived in the midst of a crisis. This is of particular concern for the United States and China, which, as previously noted, increasingly rely on space systems to execute their political and military strategies.

At the government-to-government (so-called Track 1) level, there is not currently a productive venue for the United States and China to develop a mutual understanding of how space plays into crisis stability. While space security has been incorporated into existing diplomatic and defense dialogues, these steps in the right direction have been slow and tentative, and there is much work to be done.

Recently, some engagements led by think tanks (known as Track 1.5 dialogues due to mixed delegations of government and academics) have begun to explore the issue, and it is clear that both sides harbor a lot of mistrust and misperception. The United States continues to raise questions about China's military modernization and its potential coercion of regional neighbors over contested territory. China continues to question the implications of expanding U.S. missile defenses and, to a lesser extent, the U.S. rebalance to the Asia-Pacific region.

Suspicions about space activities fit within this broader geopolitical mistrust. The United States continues to express concern about Chinese space activities and China's lack of transparency when it comes to unique space launch profiles or robotics experiments. China, for its part, expresses concerns about U.S. activities, such as the reusable experimental test platform known as the X-37B. These misperceptions are hard to resolve, both because of the inherent dual-use nature of space systems and the difficulty in creating transparency for a regime so far removed from terra firma. Resolving such suspicions and building trust take time and require a common understanding of the nature of the space domain and space systems.

Returning to the formulation of Colby, recall that "in a stable situation . . . major war would only come about because one party truly sought it, not because of miscalculation." Miscalculation is best avoided when each side understands the implications of its actions and understands how the other side will interpret and react to those actions. This situation does not exist in today's environment regarding space systems and space weapons. We lack a common understanding of how space will contribute to, or come to define, potential crises between the United States and China. As both countries seek to define a "new type of great power relationship," it would be wise to consider how new technologies and operational concepts are best managed during crises. Given both sides' growing reliance on space systems to achieve their future military and political aims, a lack of understanding comes with great peril. We should strive to build a common framework now, using dialogues during peacetime, before provocative actions in space during a crisis imperil stability here on Earth. JFQ

Notes

[1] Elbridge A. Colby and Michael S. Gerson, eds., *Strategic Stability: Contending Interpretations* (Carlisle Barracks, PA: U.S. Army War College Press, February 2013).

[2] Elbridge A. Colby, "Defining Strategic Stability: Reconciling Stability and Deterrence," in *Strategic Stability*, 55.

[3] Ibid., 57. Emphasized in original.

[4] National Space Policy of the United States of America, June 28, 2010, available at <www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf>.

[5] U.S.-China Joint Statement, November 17, 2009, available at <www.whitehouse.gov/the-press-office/us-china-joint-statement>.

[6] James P. Finch and Shawn Steene, "Finding Space in Deterrence: Toward a General Framework for 'Space Deterrence,'" *Strategic Studies Quarterly* (Winter 2011), 10–17.

[7] Herman Kahn, *On Escalation: Metaphors and Scenarios* (New York: Praeger, 1965).

[8] William Lynn, "A Military Strategy for the New Space Environment," *The Washington Quarterly* 34, no. 3 (Summer 2011), 11.

In April 2010, the United States, Canada, Spain, South Korea, and the Bill and Melinda Gates Foundation agreed to pool resources for a new multilateral agriculture and food security program (The World Bank/Simone D. McCourtie)

Debunking Technical Competency as the Sole Source of Innovation

By Burton H. Catledge

The inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine. American national leadership must understand these deficiencies as threats to national security.

—Road Map for National Security: Imperative for Change

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Academic and governmental organizations have sounded the alarm that the United States is rapidly losing technical competence, and this decline places the Nation at risk. A 1983 National Science Foundation (NSF) report stated, "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well view it as an act of war."[1] In 1999, Congress chartered

Figure.

the U.S. Commission on National Security/21st Century (also known as the Hart-Rudman Commission) to provide the most comprehensive Government-sponsored review of U.S. national security in 50 years. The report highlighted a lack of U.S. technical competence as a national security threat second only to the threat of weapons of mass destruction in the hands of terrorists.[2] This article attempts to answer the question: "Does improving technical competency enhance innovation?"

The Hart-Rudman Commission report and many others argue that technical competence is a prerequisite for innovation. Producing technically competent Americans in science, technology, engineering, and mathematics (STEM), according to such reports, would stimulate innovation. *Technical competence* refers to technically trained people with a high level of knowledge and skill related to one or more specific technologies or technical areas.[3] Technically competent individuals are typified as those who have received post-secondary STEM degrees. A lack of U.S. STEM-credentialed personnel and the subsequent technologies they produce threatens national security. For the purposes of this article, *national security* is broadly defined as success on the battlefield.

The figure illustrates the argument that technical competency drives innovation. The subsequent claim is that improvements in innovation will result in enhanced national security. If technical competency does not lead to innovation or innovation does not improve national security, then technical competency claims are unsupported. The primary drivers for increasing technical competency are the National Academy of Sciences (NAS) and similar scientific and defense organizations.

The role of technology and its influence on society are controversial. To some, technology increases the carnage of war, while others hail it as the savior of humankind. The United States tends toward the latter view. American history is replete with examples of technology positively influencing society. Technologies such as the railroad, telegraph, and steamboat provided the means to settle vast territory. Thomas Edison's electric light permitted work past sunset and hence increased productivity and output. The automobile and aircraft opened opportunities for Americans to explore the United States and the world. These technologies and the resulting improvements in quality of life were equated with progress, a relationship that has driven the Nation to elevate the role of those who give us that progress. According to a 2007 survey, 86 percent of Americans believe that the United States must increase the number of workers with science and mathematics backgrounds, or else the country's ability to compete in the global economy will be diminished.[4] Consider the closing statement in the NAS report titled *Rising Above the Gathering Storm*:

For the first time in generations, the nation's children could face poorer prospects than their parents and grandparents did. We owe our current prosperity, security, and good health to the investments of past generations, and we are obliged to renew those commitments in education, research, and innovation policies to ensure that the American people continue to benefit from the remarkable opportunities provided by the rapid development of the global economy and its not inconsiderable underpinning in science and technology.[5]

The technical competence of a nation can be measured in science and engineering degrees awarded, basic research investment in research and development (R&D), patents filed, and STEM articles published. The assumption that technology is the single greatest factor to progress has misled the American public into believing that STEM-credentialed personnel are the source of technology and that a decline in technical competency translates into a decline in progress.

Historical Patterns

There are historical precedents for policymakers and scientific organizations overreacting to perceived declines in U.S. technical competency. The pattern of declining technical competency starts with a perceived threat from another country, followed by an American outcry for improving the U.S. educational system and scientific research, only to discover later that the threat was not as dire as originally perceived. This cyclical nature of diminishing technical competency is not unique, and the roots of these warnings can be traced as far back as the late 1950s. In 1957, for instance, the Soviet Union was perceived as having a strategic advantage in the larger numbers of scientists and engineers in Soviet universities and technical institutes.[6] Following the launch of Sputnik, the U.S. Government expanded Federal support for research and education in science, mathematics, and engineering.[7] American educators at the time decried the educational system as too focused on extracurricular activities, while depicting the Soviet Union as superior in science and engineering. A Senator announced that the Soviet Union was training more scientists than any other Western nation, while an aide to Lyndon Johnson warned that Russia had 350,000 high school science and math teachers compared to 140,000 in the United States. Admiral Hyman Rickover, the dour "Father of the Nuclear Navy," hoped Sputnik would spark a revival of American intellect in the same way that the attack on Pearl Harbor catalyzed the military-industrial complex.[8] The Secretary of Health, Education, and Welfare highlighted that all Russian students took 5 years of physics and math and 4 years of chemistry. Only one in four American students even took a physics course, and just one in three took a chemistry class.[9]

In response to this perceived educational gap, the National Defense

Education Act (NDEA), passed by Congress in 1958, authorized spending slightly less than $1 billion over a 4-year period to strengthen the Nation's educational system to compete with the Soviet Union. According to Roger Geiger in *Research and Relevant Knowledge*, the "NDEA was prompted by the peculiar attitude of national insecurity and inadequacy that prevailed after Sputnik."[10] Congress declared that Federal action was required to address the "educational emergency" and "to help develop as rapidly as possible those skills necessary to national defense."[11]

The Federal Government also tried to bolster American technical competency with direct investments in scientific research. Federal investment in R&D between 1957 and 1967 more than doubled, and total government outlays for basic research at the NAS and other agencies tripled.[12] In reality, the Soviet Union was not producing scientists, but training technicians.[13] Although the Soviet threat was overblown, Sputnik and the subsequent NDEA enlarged the capacity of research universities that became increasingly dependent on the Federal Government for financial support.[14]

By the 1980s, American fears about declining technical competency focused on the threat posed by Japan and its growing export-led economy. The press and academia amplified these concerns, and Congress responded by increasing the NSF's science and mathematics budget substantially.[15] Once again, the Nation overreacted to a perceived threat, and within a few years the Investigations and Oversight Subcommittee of the Science, Space, and Technology Committee of the House of Representatives reported that there was an excess supply of newly minted scientists and engineers.[16]

By the 1990s, multinational companies working in high-tech sectors such as software, information technology, and telecommunications were claiming another STEM personnel shortage.[17] Companies were experiencing difficulty hiring skilled workers. Their claims about the looming personnel shortage, however, were not verified by other sources.[18] The current concern about U.S. STEM deficiencies echoes previous claims of shortages.

The Federal Government and industry have had difficulty making accurate predictions about future personnel demands. A National Research Council panel of experts evaluated the success of past forecasts for the 2000 science and engineering workforce estimates. The council reported that labor market projections for scientists and engineers that go more than a few years into the future are notoriously difficult and that "accurate forecasts have not been produced."[19]

Alternative Contributors to Innovation

The shortage of personnel evokes a strong U.S. reaction primarily because of the perception that innovation is based on a single factor. This single-factor method reduces a complex phenomenon into one cause and relegates other factors, such as social elements, to secondary importance.[20] The single-factor method offers a simplistic approach in identifying a cause-and-effect relationship; however, the role of technology in innovation is not as straightforward as this method prescribes. By limiting the cause-and-effect relationship to a single factor, there is great potential to overlook alternative contributors to innovation.

Technical competency proponents employ a single-factor method when they highlight the role of STEM-credentialed personnel in the innovation process at the expense of other contributing factors. However, scientists and engineers cannot be the right single factor because these groups tend to avoid the anomalies that may result in innovations. A recent article in *The Economist* claims, "Scientists' role in innovation seems obvious: The more clever people there are, the more ideas are likely to flourish, especially if they can be commercialized."[21] Although society considers them creators, designers, and researchers, these individuals tend to form conservative, rather than innovative, social groups. These groups, or communities of practice, are not necessarily more innovative that those outside the community.

The evidence that science communities of practice are more conservative and tend to coalesce is highlighted in Thomas Kuhn's *The Structure of Scientific Revolutions*. His central thesis is that scientific communities tend to conduct science that proves the established norm or paradigm, rather than discovering groundbreaking innovations. Kuhn uses the term *normal science* to describe research based on one or more past scientific achievements that a particular scientific community acknowledge as its foundation.[22] Kuhn states, "The most striking feature of normal research problems is how little they aim to produce major novelties."[23] As a result, most scientists assume that they already know what the world is like, and research typically reaches conclusions confirming these scientists' anticipated outcomes.[24] Normal science does not attempt to discover and investigate anomalies, and, when conducted successfully, it finds none.[25] Scientists and engineers contribute to innovation, but they are not its single source.

Rather than being unbiased and objective thinkers, scientists will anticipate research conclusions because of past training. Members of the scientific community, more than most other fields, have undergone similar education and professional initiations, been exposed to the same technical literature, and drawn many of the same lessons.[26] Kuhn continues, "One of the fundamental techniques by which members of a group . . . learn to see the same things when confronted with the same stimuli is by being shown examples of situations that their predecessors in the group have already learned to see as like each other and as different from other sorts of situations."[27]

If scientists and engineers were the single factor driving innovation, the expectation would be that innovation would only come from this community. However, innovation can and often does result from ideas outside the community of practice. Edward Constant, in *The Origins of the Turbojet Revolution*, offers such an example of innovation resulting from outside the expected community. Conventional wisdom held that aircraft

performance could be improved by modifying the existing aeronautical design with supercharged liquid-cooled piston engines, turboprops, higher octane fuel, and sleeker aircraft structures to increase performance. The aeronautical community of practice, however, required a completely new aeronautical design that was drastically different from the conventional wisdom. This design would not come from the expected community of practice. Constant cites the fact that four men, geographically separated and with diverse backgrounds outside the normal aeronautical community, produced the turbojet engine.[28] Narrow communities of practice, such as the aeronautical community, tended to overlook the anomalies that could have provided the important sources of innovation within their fields.

The theory that increasing the number of STEM-credentialed personnel increases innovation is not an *iron law of science*. Scientists do not evaluate research with unbiased and objective lenses, but their communities of practice often shape their vision. This vision makes the recognition of anomalies difficult because of similar backgrounds and education. When those anomalies present themselves, those closest to the problem tend to overlook them, while outsiders attempt to explain them. If outsiders are capable of identifying anomalies and translating those insights into innovations, the science and engineering communities of practice cannot be the single source of innovation.

Techno-nationalism

If four men in three countries simultaneously and independently developed the turbojet, how can a nation hope to capture the benefits of its scientific and technical communities? Proponents assume that the United States will be more innovative if it has more technically competent personnel. However, invention only opens a door; it does not compel one to go through it. The acceptance or rejection of an invention depends on the condition of a society, imagination of its leaders, and nature of the technology itself.[29] Nations do not necessarily exploit the benefits of inventions developed within their borders. The internal combustion engine was first produced in Germany, but that country was not the main manufacturer of automobiles within 20 years of the industry's formation. The airplane was invented in the United States in 1903, but Great Britain, France, and Germany capitalized on the invention with larger air fleets by 1914.[30] Although air fleet size alone is not a measure of innovativeness, it does highlight society's willingness to capitalize on an innovation. The underlying assumption of technical competency advocates is that if a nation's community of practice produces an innovation, that innovation will remain within the country's borders. This assumption encourages nations to develop technically qualified personnel and innovations along nationalist lines. This assumption is a variation of nationalistic ideology called *techno-nationalism*.

Nationalism denotes a condition of the mind in which members of a nationality or nation-state express loyalty to that state above all other loyalties and to which pride in one's nationality and belief in its intrinsic excellence and in its "missions" are integral parts.[31] In other words, nationalism is an ideology that promotes a country's accomplishments as superior compared to other nation-states. Three factors must be considered to understand nationalism and its propagation. First, a group of intellectuals must promote a nationalist doctrine. In the case of the technical competency advocates, the intellectuals promoting the nationalistic ideology are U.S. policymakers. Second, these citizens typically find satisfaction and refreshment for their souls (and often their pocketbooks) in this doctrine. Since the Federal Government is the single largest source of basic research funding, organizations such as the NAS must continue to emphasize threats to U.S. science and engineering superiority. As mentioned earlier, fears that the United States was losing its technological advantage as compared to the Soviet Union, Japan, China, and India have all resulted in large infusions of government funds into science and engineering organizations. After Sputnik, for instance, scientists urged President Dwight Eisenhower to appoint a Presidential Assistant for Science and Technology to increase the funding of NSF grants in fiscal year 1958 from $38 million to $55 million.[32] Curiously, the organizations emphasizing declining U.S. technical competency today are the same organizations that would receive the greatest benefit from Federal aid. Third, the nationalistic doctrine must find a place in the popular mind by means of "new and curious, but singularly universal, forms of mass-education."[33] One of the consequences of the Sputnik launch was increased Federal funding of science education from $17 million to $53 million in 1958.[34] The three factors that characterize nationalism and its propagation are applicable to the declining technical competency claim.

A techno-nationalist country claims that it is best suited for the technology age.[35] Citizens of a techno-nationalist country tend to view their country as technologically superior to other nation-states. The techno-nationalist country can also be threatened by other nations that demonstrate a technical capability or capacity that threatens its superiority. In the 20th century, the United States characterized the Soviet Union, Japan, China, and India as technological competitors, and this competition stirred a nationalist need to innovate. According to David Edgerton, "Techno-nationalism assumes the key unit of analysis for the study of technology is the nation: nations are the units that invent, that have R&D budgets, cultures of innovation, that diffuse, that use technology. The success of nations, it is believed by techno-nationalists, is dependent on how well they do this."[36]

The claim that the United States must develop more STEM-credentialed personnel is grounded in a techno-nationalistic ideology. The issue is not that there is a dearth of scientists and engineers, but rather that those scientists and engineers are not Americans. If increasing technical competency in the United States was the only dilemma, the science and engineering workforce could be managed with changes in immigration policy. In other words, if all the United

Cecil County math teachers visited Edgewood Chemical Biological Center for Math Forensics where Army scientists demonstrated importance of math in their research and development mission (U.S. Army)

States needed was a more technically qualified workforce, the solution should be to increase the number of foreign-born citizens authorized to work in the United States. However, rather than encouraging workers from abroad to fill positions requiring STEM-credentialed personnel, the United States is seeking to limit the number of foreign workers. In response to immigration reform, technical competency proponents will often cite the U.S. citizenship requirement to fill security-related positions. This could be overcome by changes to American security policies. There is a historical precedent. During World War II, the United States relied heavily on European immigrants to complement its science and engineering workforce. U.S. citizenship and subsequent security requirements could be modified to fill science and engineering positions that require this level of access. Increasing the number of foreign-born citizens filling the technical workforce and modifying U.S. security policy, however, do not satisfy technical competency advocates because the core of the issue is not pragmatism but nationalism. The Hart-Rudman report states:

There will not be enough qualified American citizens to perform the new jobs being created today—including technical jobs crucial to the maintenance of national security. Already the United States must search abroad for experts and technicians to fill the United States domestic economy, and Congress has often increased the category limits for special visas (H-1B) for that purpose. If current trends are not stanched and reversed, large numbers of specialized foreign technicians in critical positions in the United States economy could pose security risks.[37]

More important, however, while the United States should take pride in educating, hosting, and benefiting from foreign scientific and technical expertise, it should take even more pride in being able to educate American citizens to operate their own economy at its highest level of technical and intellectual capacity.

Techno-globalism

The danger of pursuing a techno-nationalist ideology in a globalized marketplace makes the advantages gained from technology extremely perishable. If the United States were to produce an innovative technology, globalization has increased the likelihood that the invention would be replicated and modified by nonproducers of the technology. The United States is proud of its market-driven economy, but it seems reluctant to let market forces guide the development of American STEM personnel.

Today's market-driven economies have produced interdependent world financial markets through globalization. The principal characteristics of globalization are increases in foreign direct investment, intensified international rivalries in technology, and looser trade

Thomas Edison in Washington, DC, April 1878, with his second phonograph (Library of Congress/ Mathew Brady)

restrictions.[38] Globalization has also created technological interdependence that places the techno-nationalist country at a disadvantage. Globalized corporations, which are not limited to national borders, must innovate more rapidly and effectively to remain competitive. The competition between globalized firms results in collaboration across national boundaries, and the fruits of this innovation do not remain within national borders. Conversely, the techno-nationalist country seeks to limit innovation to within its national borders and is therefore in direct conflict with the market economy. This implies that the techno-nationalist country is fighting a losing battle because market incentives tend to encourage innovation. *Techno-globalism* is the term used to describe the impact of sharing technology in a globalized, market-driven economy.[39]

Techno-globalism challenges the country pursuing techno-nationalism. First, the expansion of international trade has made high-tech products available to countries that do not have the technological capacity to produce them. Second, nations are losing control of businesses as they become more transnational through overseas direct investment. If Walmart were a country, it would be China's eighth largest trading partner.[40] The Walmart example emphasizes the difficulty the United States would have in imposing restrictions on multinational firms such as these. Third, many foreign scientists and engineers are trained in the United States and are now working in their native countries. Seventeen of the world's top 20 universities are American, and international students and scholars flock to the United States to enhance their skills and collaborate with American researchers.[41] The education of foreign-born scientists and engineers has created a global diffusion of technical competency leveling the science and engineering knowledge base. Since the diffusion of science and engineering knowledge is already occurring, preventing collaboration across national borders would stifle, not encourage, innovation. Techno-nationalist countries such as the United States, which seek to produce STEM personnel and technologies along nationalistic lines, may invest considerable resources only to discover that globalization offers a greater innovation advantage.

Many 20th-century inventors would not have been predicted to create inventions using the current measures of innovation. STEM advocates would have dismissed Edison when he was 7 years old and described by his teacher as "addled."[42] He was withdrawn from school by his mother and received his education working as a telegraph operator. With no formal education, Edison went on to hold 1,093 patents and produce technologies such as motion picture cameras, the phonograph, and light bulb.

Orville and Wilbur Wright also had atypical backgrounds with no formal education but still produced a significant technological achievement. Orville dropped out of high school in his junior year to start a printing business with his brother, using a damaged tombstone and buggy parts to build a press.[43] The two brothers later opened their own bicycle business, but Wilbur's interest in aeronautics started after reading about a famous German glider pilot. Wilbur's

significant breakthrough was his recognition that in order to fly a machine, its three axes of motion—pitch, roll, and yaw—had to be controlled.[44] Other inventors attempted to develop such a machine; however, on December 17, 1903, an unlikely high school dropout with a printing press and bicycle repair background invented a flying machine that changed the world.

Arguably the most significant innovation in the later 20th century was the personal computer (PC). Interestingly enough, the two individuals most responsible for development of personal computing also had diverse backgrounds with limited formal educations. Steve Jobs and Bill Gates were at the forefront of personal computer innovation, but neither would have been recognized as STEM-credentialed professionals according to current metrics.

Steve Jobs's innovativeness and business sense were not provided by formal education. He dropped out of Reed College after 6 months and along with his friend Steve Wozniak built the first Apple computer in his parent's garage. After leaving Apple in 1985, Jobs started NeXT, which later became Pixar.[45] He revolutionized the smartphone industry with the introduction of the iPhone in 1997, which remains the market leader today.

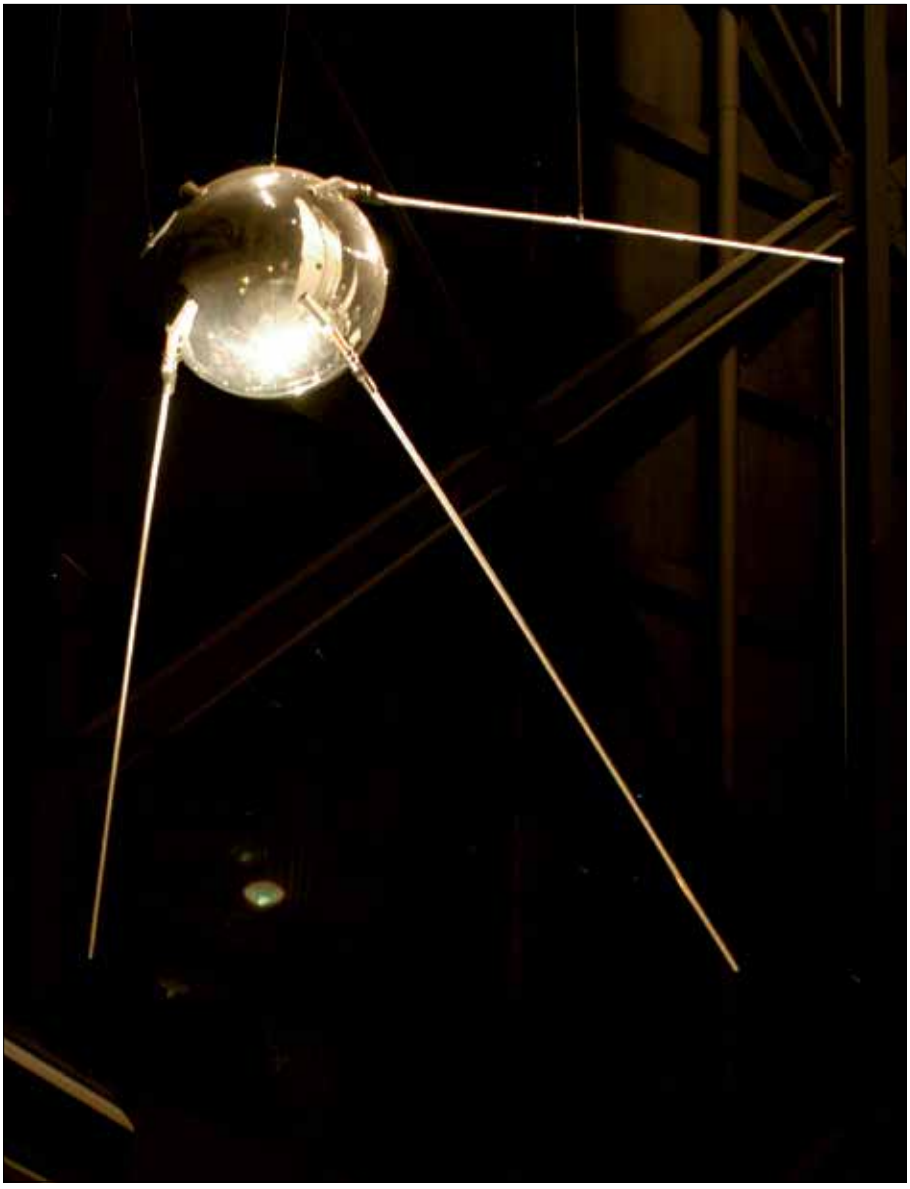
Similar to Jobs, Bill Gates dropped out of Harvard after 2 years to start Microsoft with Paul Allen. Their vision was a computer on every desk and in every home. IBM approached Gates and Allen to develop software to interface with their computer hardware. They programmed the Microsoft Disk Operating System, which became Windows 1.0 in 1985. Since then, Microsoft has released multiple versions of its software, with Windows being the predominant worldwide computer operating system.[46]

Technical competency advocates contend that technological innovation spurs economic prosperity; however, commercialization of innovation can create even greater economic benefits. Edison, the Wright brothers, Jobs, and Gates were more than inventors; they were savvy businessmen who understood their environments. For instance, Edison did not invent the first incandescent light bulb, but his bulb lasted longer with its carbonized thread. His real innovative success was the introduction of a central power plant with generators, voltage regulating devices, and copper wires to create a commercial market for the light bulb.[47] The Wright brothers were not the only inventors working on a flying machine when the Wright Flyer first flew, but it was a contract with the Army in 1907 that commercialized the success of the aircraft.[48] Xerox Palo Alto Research Center created the mouse and Graphical User Interface, but Steve Jobs recognized the significance of the inventions and integrated them with the personal computer.[49] IBM was working on its own operating system called Top View in 1985 while VisiCorp had already released an operating system in 1983 called VisiOn that contained the first PC-based Graphical User Interface.[50] Gates and Allen would not release Windows 1.0 until 1985, but Microsoft is running on 91 percent of computers worldwide.[51]

Sustaining vs. Disruptive Technologies

Advocates for increasing the number of STEM-credentialed graduates often link U.S. innovation to economic prosperity. A common misperception is that the next innovation breakthrough will result in significant economic gains for the organization, company, or country that creates it. Clayton Christensen addresses this fallacy in *The Innovator's Dilemma* by offering an explanation of why successful companies fail to stay on top of their industries when confronted by certain markets and technological change.[52] Christensen argues that successful companies are led by talented managers who focus on developing sustaining technologies rather than on what he calls disruptive technologies. Sustaining technologies are characterized by improving on established product performance by making incremental improvements. Disruptive technologies, however, typically underperform established products in mainstream markets, but have other features that customers value such as being cheaper, simpler, smaller, and frequently more convenient to use.[53] Disruptive technologies will eventually overtake or match the performance of the sustaining technology based on market demand. Conversely, sustaining technologies will focus on product improvements that may be beyond what the market demands. In other words, managers of successful top companies may invest heavily to improve their existing product and later discover that the improvement outstrips market demand. Apple's iPhone and Samsung's Galaxy provide a good illustration of disruptive and sustaining technologies in the smartphone market.

Steve Jobs did not invent the cellphone, MP3, hand-held computer, or digital camera, but he did recognize that integrating these devices would revolutionize the portable electronics industry. Apple released the first-generation iPhone in 2007 and rapidly became the market leader in the smartphone and consumer electronics technology. The first-generation iPhone represented a disruptive technology because it was less expensive to purchase the capabilities individually. The first-generation iPhone did not include available technologies such as the Global Positioning System that may be found in other smartphones. Since 2007, Apple has invested in sustaining iPhone technology by releasing newer generations that included faster processors, better cameras, and improved navigation.[54] Korean electronics giant Samsung challenged Apple's lead position in 2011 when the company flooded the market with myriad products such as cellphones, smartphones, and tablets in a short period of time to appeal to low- and high-end markets.[55] Samsung's strategy appears to have been particularly successful with lower end markets, as evidenced by the company's market share doubling to more than 36 percent in the second quarter of 2011 from about 18 percent during the same period the previous year.[56] Samsung introduced a disruptive technology; its strategy was to cater to those markets that wanted a less expensive and possibly less capable smartphone.



Replica of Sputnik 1 (U.S. Air Force)

Apple lost a considerable share of the smartphone market by investing in a sustaining technology while Samsung invested in disruptive technology by developing a less expensive and capable product to create a new market. Christensen argues that large, well-managed companies fail to invest in disruptive technologies for a number of reasons. First, successful companies depend on customers and investors for resources and are reluctant to seek lower margin opportunities that their customers do not want.[57] Second, small markets do not solve the growth needs of large companies. Third, markets that do not exist cannot be analyzed. Prior to making a significant investment, companies often want to understand the environment and likelihood of success. Since disruptive technologies are entering emerging markets, the environment is not well understood, and therefore large successful companies are reluctant to enter. Fourth, an organization's capabilities define its disabilities. There is a tendency in successful organizations to develop high-margin over low-margin products. Finally, technology supply may not equal market demand. Companies developing sustaining technologies follow a trajectory of improvement that often ends up overshooting mainstream market needs and creating a vacuum where competitors can enter.[58]

A STEM-Literate Approach

STEM-credentialed personnel are needed in the workforce, but they are not the sole source of innovation. Rather than creating new innovations, this segment of the workforce tends to focus on sustaining technologies. Instead of focusing on sustaining technologies, a U.S. policy is needed that creates a STEM-literate workforce. In *David and Goliath: Underdogs, Misfits, and the Art of Battling Giants*, Malcolm Gladwell claims that more than half of college students who start a STEM degree program change their majors. STEM advocates may point to this statistic as an education failure to prepare college-bound students in these courses of study and demand further funding of high school STEM education. Instead of increasing high school funding for STEM education, we should incentivize STEM literacy and innovation.

One reason that college students do not pursue STEM degrees or drop out of the programs is that graduates can earn more money in service-related industries such as health care, finance, and law. A STEM-literate policy recognizes the financial incentive for entering these industries and provides graduates a broader background in STEM disciplines. Literate graduates entering service industries would understand STEM without having to commit to 4 years of study.

The United States should not directly compete with countries such as China and India on the number of STEM college graduates, but instead should leverage its own strengths such as leading university systems, an entrepreneurial culture, U.S. intellectual property rights protection, and natural resources to foster innovators. A STEM-literate policy would create graduates who can improve publishing technologies, business majors who can develop predictive economic indicators, and economics graduates who understand the human genome.

The government has significant leverage to encourage STEM literacy using

Federal funding such as Pell Grants. President Barack Obama's fiscal year 2014 budget request included $29.9 billion in Pell Grant funding.[59] A condition for Federal financial aid would include a requirement for students to successfully complete STEM-literate courses. Universities could tailor these courses for non-STEM majors and create degree tracks that encourage innovation. College Level Examination Program tests could be created to allow high school students to test out and still receive Federal aid. These tests would serve as an incentive for college-bound high school students to complete STEM courses prior to high school graduation. A policy that creates STEM-literate graduates creates a workforce capable of developing innovative solutions by integrating multiple disciplines. **JFQ**

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[54] Rene Ritchie, "History of iPhone: From revolution to what comes next," *iMore.com*, September 1, 2014, available at <www.imore.com/history-iphone>.

[55] "Samsung's Market-Flooding Strategy May Not Work Much Longer," *Forbes.com*, September 6, 2012, available at <www.forbes.com/sites/greatspeculations/2012/09/06/samsungs-market-flooding-strategy-may-not-work-much-longer/>.

[56] Ibid.

[57] Christensen, 36.

[58] Ibid., 41.

[59] "President's FY 2014 Budget Request for the U.S. Department of Education," April 10, 2013, available at <www2.ed.gov/about/overview/budget/budget14/index.html>.

President Obama meets in Situation Room with national security advisors to discuss strategy in Syria (The White House/Pete Souza)

Should Military Officers Study Policy Analysis?

By Nikolas K. Gvosdev

Recently, during a symposium with security studies faculty members from civilian institutions, the question arose as to how those of us who teach in the country's professional military institutions approach the study and use of policy analysis in our classrooms. There was a certain degree of incredulity that places such as the Naval War College (and its sister institutions) would encourage their students—people bound by oath to faithfully execute the orders of the commander in chief—to probe and analyze decisions taken by the current and past Presidents as part of their academic experience. Indeed, many question whether military officers need to engage in the dissection and discussion of national security decisionmaking since, echoing Alfred Tennyson's famous exhortation in his classic poem "The Charge of the Light Brigade," "Theirs not to reason why/Theirs but to do and die." Others take the view that, for military officers, ignorance may be bliss, following the advice popularly ascribed to the German chancellor Otto von Bismarck: "The less the people know about how sausages and laws are made, the better they sleep in the night."

Such a view helps to explain why, initially, the study of "politics"—the behind-the-scenes and often messy process by which national security decisions are made—was not deemed appropriate for officers. Soon after the formation of the Naval War College, however, that

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approach was reversed. In his lectures, Alfred Thayer Mahan noted that although the direction of national policy is properly set by the "statesmen," political questions "are also among the data which the strategist, naval as well as land, has to consider"; Mahan explicitly renounced the notion, which he said "once was so traditional in the navy that it might be called professional," that "politics are of no professional concern to military [officers]."[1] Yet the concern remains that the captain or colonel who in the classroom is learning to use analytic perspectives to examine decisionmaking could upset an already precarious civil-military relationship by giving him or her additional tools "to frustrate or evade civilian authority when the opposition seems likely to preclude outcomes the military dislikes."[2] Policy analysis, after all, moves away from the more general study of the prevailing global and regional security trends (covered in the discipline of international relations) to concentrate on government decisionmaking.[3] It is the proverbial "peek under the hood" at what underlies international affairs and is centered on understanding how policy is shaped and executed at the national level.[4] Policy analysis focuses on probing the "whys" of governmental behavior—to open up and probe the "black box" of the decisionmaking process so that "one could . . . recognize the actual complexity underlying decisions (which includes individual biases and bureaucratic processes)."[5]

What seems to disturb people is that a sustained classroom examination of national security policy punctures the myth embodied in the "rational actor model"—that is, the idea that decisions are taken as a result of a deliberative process where all options are placed on the table and considered and where a choice is made based on the assessment of what best serves the national interest. It assumes, as Amy Zegart has noted, that the Nation's decisionmaking process has been "structured to translate national objectives into national policies and to carry those policies out faithfully"—an approach she calls "theoretically elegant" but one that falls short of fully explaining how and why decisions are made.[6] Thus, as Michael Clarke has observed, "Any study of a state's foreign policy over a given period reveals that rather than a series of clear decisions, there is a continuing and confusing 'flow of action' made up of a mixture of political decisions, non-political decisions, bureaucratic procedures, continuations of previous policy, and sheer accident."[7]

Policy analysis forces students to consider the influence of political agendas, personalities, rivalries, bureaucratic interests, the media, legislative input, and outside advocates and lobbyists, among others. It strips away the rhetoric of sacrifice in the service of vital national interests to reveal Robert Putnam's "two-level game," where, at "the national level, domestic groups pursue their interests by pressuring the government to adopt favorable policies, and politicians seek power by constructing coalitions among those groups. At the international level, national governments seek to maximize their own abilities to satisfy domestic pressures, while minimizing adverse consequences of foreign developments."[8] Objections to the study of policy analysis are similar to those voiced about the creation of fellowship programs that would allow officers and others to be placed as observers in senior levels of government, which argue that doing so is akin to "letting little children watch the sex act"—with a corresponding loss of innocence in discovering how "messy, disappointing, even shocking" the policy process can be—and potentially undermining confidence in how government functions.[9]

One concern is that officers might choose to ignore policy directives if they were to conclude that a particular decision was motivated not by a dispassionate analysis of the national interest, but resulted from a satisfying compromise between different bureaucratic interests or came about due to sustained lobbying efforts of a particular constituency. Even worse would be if the graduates of the country's professional military education (PME) institutions decided to take this knowledge and use it to become policy *makers* rather than policy *executors*. Already, there are worries that

> *the military can evade or circumscribe civilian authority by framing the alternatives or tailoring their advice or predicting nasty consequences; by leaking information or appealing to public opinion (through various indirect channels, like lobbying groups or retired generals and admirals); or by approaching friends in the Congress for support. They can even fail to implement decisions, or carry them out in such a way as to stymie their intent.*[10]

But are the country and its national security best served by having officers leave the schoolhouse never having been exposed to or applied the work of scholars and practitioners such as Graham Allison, Steven Krasner, Mort Halperin, Valerie Hudson, and Bob Jervis to real-world national security decisions? Should we worry that some officers may be inspired to become policy entrepreneurs and in so doing try to upset the balance of civil-military relations? Would a frank discussion in the classroom of the "other forces that drive U.S. policy (interest groups, lobbies, alliance commitments, legal constraints, geopolitics, etc.)"[11] fatally undermine trust in—and acceptance of—civilian control? Would a detailed examination of the factors and influences that, for instance, led President George W. Bush to commit to military action in Iraq in March 2003 (or President Barack Obama to eschew the use of force against Syria in September 2012) compromise the authority of the commander in chief? My answer to these questions is a clear *no*.

First, these concerns can be mitigated by carefully framing how policy analysis is taught in the classroom. Partisan critiques, for instance, do not constitute policy analysis. Instructors must draw a clear line between *policy analysis*—a dispassionate assessment of the facts on the ground and the consequences and implications of the possible options for addressing a particular problem—and *policy advocacy*—marshaling arguments in favor of or against a particular course of action.[12] Taught correctly, policy analysis focuses attention on the importance of structures and organizations, with an interest in the immediate decision environment, and then expands the

Retired Army General Colin Powell signs books at Marine Corps Exchange aboard Marine Corps Base Quantico in June 2013 (U.S. Marine Corps/Sam Ellis)

discussion to encompass both domestic and international influences on policy. The goal of these exercises is to explain "process, as opposed to foreign policy outcomes."[13] In other words, the question we seek to have our students answer is to understand how and why decisions were made—rather than whether they were "good" or "bad"—through a more in-depth examination of "the actors, their motivations, the structures of decision-making and the broader context in which . . . policy choices are formulated."[14]

Furthermore, there are a number of compelling reasons to have military officers study policy analysis. Many of those involved in the field of policy analysis see their work "as aimed at improving foreign policy decision making to enable states to achieve better outcomes."[15] National security decisions "involve a great deal of uncertainty" with a number of issues subject to debate; a study of policy helps those who will provide their professional opinions and be charged with the execution of policy directives to "understand the debate" and the factors that led to a decision.[16] In addition, as graduates of PME institutions rise through the ranks, they are more likely to end up in positions to give advice or provide options to senior decisionmakers; an understanding of the policy process allows them to provide civilian decisionmakers with feasible and realistic alternatives.[17] Advice that is often given to public-sector scientists, and is just as apropos for military officers who are tasked to provide recommendations to civilian policymakers both in the executive branch as well as in Congress, is as follows:

[W]*hen the major points of dissension in a policy debate are over values and preferences (the usual case), try to exhort decision makers to focus on these often fractious elements of the decision making process rather than the technical and scientific aspects. Debates of questions of science often end up serving as a surrogate polemic for the inability (or unwillingness) of decision makers to adjudicate unpleasant value and preference trade-offs. Do not fall into the trap of substituting debate over scientific information and interpretation of data for debate over which values and preferences will carry the day. . . .* [B]*e brutally honest with decision makers about the technical feasibility of each possible policy option and the uncertainties associated with the resulting . . . consequences. Often, the most useful input scientists can provide is to identify the estimated probability of success (for achieving the stated policy goal) for each of the various competing policy options.*[18]

American professional military education places great emphasis on the study and application of strategy, and "senior military officers, first and foremost, must be knowledgeable about the planning and execution of military

operations at the theater and strategic levels."[19] Yet such plans are not formulated in a vacuum. Instead, they are "an organized action or an integrated set of actions—from making public declarations to waging war—intended to bring about favorable consequences that will help achieve articulated national goals."[20] Indeed, the "management of violence"—identified by Samuel Huntington as the essence of the military mission—seems far too narrow given the much wider range of tasks that fall under the rubric of national security. Today's military officer is really a "national security professional" whose expertise is expected to extend to the interconnected intellectual space of everything from strategic theory, strategic thinking, and strategy formation to diplomacy, nation-building, and homeland defense.[21]

Strategy often focuses on providing the "ideal" or "best" possible way to achieve goals. Policy analysis helps to explain why the "best" options may not always be available to or feasible for policymakers. Former Soviet leader Mikhail Gorbachev, building on another Bismarckian observation, noted, "Politics is the art of the possible, the emergence of agreed interests through a process of choice."[22] Theoretical options may not be available in reality. An air operation that is technically feasible might have to be scrapped if needed overflight rights over a country are not forthcoming. A mission might not be authorized if there is an expectation that it might lead to bad press coverage broadcast around the word on CNN and Al Jazeera. In his observations about the national security team of George H.W. Bush, Bob Woodward noted that decisions were evaluated not only on their strategic merit but also on their likely impact on Congress, the media, and public opinion; as a result, part of the policy process was focused on managing these reactions.[23] The extent to which political considerations influence strategic decisions is something officers cannot ignore.

Indeed, senior military leaders and their staffs are not immune from the necessity of knowing how the political system operates. In an analysis of the decision taken in 2009 to retire General David McKiernan as commander in Afghanistan, Rajiv Chandrasekaran, a reporter for the *Washington Post*, concluded that the decision "reflects a view among senior Pentagon officials that top generals need to be as *adept at working Washington* as they are the battlefield, that the conflict in Afghanistan requires a *leader who can also win the confidence of Congress and the American public*." Chandrasekaran went on to note that the definition of what constituted an effective senior military leader has been changing, quoting a senior Pentagon official: "The traditional responsibilities were not enough anymore. You had to be adroit at international politics. You had to be a skilled diplomat. You had to be savvy with the press, and you had to be a really sophisticated leader of a large organization."[24] Defense correspondent Thom Shanker of the *New York Times* concurs, pointing out, "Mastery of battlefield tactics and a knack for leadership are only prerequisites. Generals and other top officers are now expected to be city managers, cultural ambassadors, public relations whizzes and politicians as they deal with multiple missions and constituencies in the war zone, in allied capitals—and at home."[25]

Working through the policy process, however, can be a type of cultural shock for career military officers. One staffer at the National Security Council observed that in his experience, military officers, particularly naval officers, wanted to go off in isolation and work on "The Solution" to a problem at hand—to provide the "best" strategic option. The problem, he noted, was that whatever was proposed would be dead on arrival unless there had been significant input and buy-in from all the key policy stakeholders. This is why Jon Anderson, a public policy analyst, counsels, "If you hold on too tightly to your policy formulation you will wither in this environment."[26] Policy analysis gives officers a basic fluency in the language of national security affairs as spoken by the members of the so-called strategic class—"the foreign-policy advisers, think-tank specialists and pundits"[27] both within the government as well as those outside with whom they will be interacting.

Holding to a supposed ideal that national security decisions ought to be "above" politics, personalities, and organizational interests—and structuring a PME curriculum that fails to educate students about the actualities of the national security decisionmaking process—constitutes an academic dereliction of duty by failing to prepare officers for the realities they will encounter. The process is explicitly and deliberately political. Speaking at the Naval War College more than two decades ago, when he was Chairman of the Joint Chiefs of Staff, General Colin Powell advised the students:

You are about at that point in your career now . . . when you have to have a better understanding of the broader context in which you are serving. When you have to have a better understanding of what is happening on the world scene. Where you need a better understanding of how politics works, of how public relations work, as to how you generate support for the armed forces of the United States. To make sure you understand the influences that are pressing on the Department and on your particular service.

It's important for you, at this stage in your career, to . . . have a firm grasp of the outside pressures that come to bear, the political pressures, the public relations pressures. I am still not satisfied that senior officers coming up, or officers at this level, really understand the political context and how politics works in Washington. It's not a dirty business. It's the business that the "good guys" upstairs put in place.

Anybody who says that politics is nasty, and military people should stay away from it, or never become a political general—don't worry about that—you're not going to be successful. Politics is the way the country runs; it's the way our Founding Fathers wanted it to run. So as you become more experienced, as you leave here and go on to jobs, start to understand the international situation a little more. Start to understand the political context in which we do our business. Start to understand the public relations and the media context in which we do our business. Because ultimately we

General David D. McKiernan visited Marines with 1st Battalion, 6th Marine Regiment, 24th Marine Expeditionary Unit in Garmsir 6 days after assuming command of International Security Assistance Force (U.S. Marine Corps/Alex Guerra)

are answerable to the American people, not by us giving speeches, but by us defending our actions to our political leaders, to those who have been elected over us, and by our explaining our actions through the media to the American people, and ultimately ensuring that we are doing what the American people wish us to do.[28]

Our goal as national security educators is to ensure that our graduates will be able to operate knowledgeably and professionally in this environment and recognize the forces at play in the decisionmaking arena. JFQ

Notes

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[3] Valerie M. Hudson, "Foreign Policy Decision Making: A Touchstone for International Relations Theory in the 21st Century," in *Foreign Policy Decision Making (Revisited)*, ed. Richard C. Snyder et al., 1 (New York: Palgrave Macmillan, 2002).

[4] Alex Mintz and Karl DeRouen, *Understanding Foreign Policy Decision Making* (Cambridge: Cambridge University Press, 2010), 7.

[5] Chris Alden and Amnon Aran, *Foreign Policy Analysis: New Approaches* (New York: Routledge, 2012), 22.

[6] Amy Zegart, *Flawed by Design: The Evolution of the CIA, JCS, and NSC* (Stanford: Stanford University Press, 1999), 4.

[7] Quoted in John Dumbrell, *The Making of U.S. Foreign Policy*, 2nd ed. (Manchester, UK: Manchester University Press, 1990, 1997), 17.

[8] Robert Putnam, "Diplomacy and Domestic Politics: The Logic of Two-Level Games," *International Organization* 42, no. 3 (Summer 1988), 434.

[9] Joe Laitin, quoted in Colin Powell, *My American Journey*, rev. ed. (New York: Ballantine Books, 2003), 167.

[10] Kohn, 15–16.

[11] Stephen M. Walt, "Wishful Thinking," *Foreign Policy*, April 29, 2011, available at <www.foreignpolicy.com/articles/2011/04/29/wishful_thinking?page=full>.

[12] Robert T. Lackey, "Science, Scientists, and Policy Advocacy," *Conservation Biology* 21, no. 1 (February 2007), 12.

[13] Alden and Aran, 1.

[14] Ibid.

[15] Ibid., 1–2.

[16] Mintz and DeRouen, 6.

[17] On indirectly being involved in the policy process by providing alternatives, see the comments of Stephen J. Andriole, Jonathan Wilkenfeld, and Gerald W. Hopple, "A Framework for the Comparative Analysis of Foreign Policy Behavior," *International Studies Quarterly* 19, no. 2 (June 1975), 163.

[18] Lackey, 17.

[19] Kevin P. Kelley and Joan Johnson-Freese, "Rethinking Professional Military Education," *FPRI E-Notes*, October 2013, available at <www.fpri.org/articles/2013/10/rethinking-professional-military-education>.

[20] Richard L. Kugler, *Policy Analysis in National Security Affairs: New Methods for a New Era* (Washington, DC: NDU Press, 2006), 12.

[21] Harry Yarger, *Strategy and the National Security Professional: Strategic Thinking and Strategy Formulation in the 21st Century* (Westport, CT: Praeger, 2008). See also George W. Bush, Executive Order 13434, "National Security Professional Development," May 17, 2007, available at <www.fas.org/irp/offdocs/eo/eo-13434.htm>.

[22] See "Gorbachev defends pace of his reforms in Stanford speech," Stanford News Service, May 12, 1992, available at <http://news.stanford.edu/pr/92/920512Arc2222.html>.

[23] Bob Woodward, *The Commanders: The Pentagon and the First Gulf War, 1989–1991* (New York: Simon and Schuster, 1991), 81.

[24] Rajiv Chandrasekaran, "Pentagon Worries Led to Command Change," *The Washington Post*, August 17, 2009, available at <www.washingtonpost.com/wp-dyn/content/article/2009/08/16/AR2009081602304.html>. Emphasis added.

[25] Thom Shanker, "Win Wars? Today's Generals Must Also Politick and Do P.R.," *The New York Times*, August 13, 2010, available at <www.nytimes.com/2010/08/13/world/13generals.html?ref=todayspaper>.

[26] Jon Anderson, "Sausage and the Art of Public Policy Making," *The Examiner*, November 27, 2010, available at <www.examiner.com/environmental-policy-in-national/sausage-and-the-art-of-public-policy-making#ixzz1LIl30vVr>.

[27] Leon Hadar, "The 'X' Dreams of Washington's Wonks," *Asia Times*, April 4, 2007, archived at <www.cato.org/publications/commentary/x-dreams-washingtons-wonks>.

[28] Colin S. Powell, "The Triangle Analogy," excerpt of an address given at the Naval War College, Newport, RI, June 6, 1990.

Defensive line of Berkut soldiers in riot gear by Cabinet of Ministers building during 2013 Euromaidan protests (Ivan Bandura)

Assessing Causality in a Complex Security Environment

By Andrew L. Stigler

In May 2014, I was moderating a Naval War College seminar on the topic of U.S. policy in the Middle East. The discussion involved President George W. Bush's statement that a democratic Iraq would serve as a "beacon of democracy" in the Middle East, leading nations and peoples in that region to reappraise their systems of government and, perhaps, initiate democracy movements of their own. A student raised his hand.

"Well, we know it worked," said a Navy captain. I asked how. "The Arab Spring. That shows that the image of an Iraqi woman holding up her purple fingertip after having voted, it resonated with the entire region. I mean, look what happened."

I offered counterarguments. Did that image have the same meaning to other audiences that it did to us? How many people in the region saw the image? Was that image counteracted by distrust of America's motives in Iraq? The student shook his head. "We know it worked," he said.

To my understanding, methodological issues receive little coverage in the professional military education (PME) system. There are many excellent reasons for this, one of which is that the master's degree that students receive is not in political science, but covers a host of critical strategic issues and other topics. But PME is also the last opportunity to address, in an educational setting, subjects in the social sciences that could genuinely benefit those students.

Causality is one of these critical issues. Causality has many definitions, but we might profitably see it as the search for reasons as to why a particular event occurred.

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Causality is certainly studied in the military in the physical sense: calculating a jet engine's thrust or managing the operation of a nuclear reactor, for example. But officers preparing for greater responsibilities, including understanding contingencies in the international arena, are forced—whether they know it or not—to address causality in the strategic arena.

A causal relationship is a way of describing how a cause and effect interact. A change in the cause leads to a change in the effect (at least some of the time), or there is no cause and effect relationship.[1] A simple representation would be *cause → effect*.

Often a mechanism, seen or unseen, is involved. When a car strikes a light pole and the light pole falls down, we see the causal relationship. Other physical causal relationships are unseen, such as gravity causing an apple to fall from a tree.

Causation and Its Pitfalls

Efforts to simplify complex causal relations in the international arena account for much of the work in political science, which seeks to illuminate issues of strategic significance. Consider the subject of deterrence. In one of his most prominent early works, John Mearsheimer offered a relatively simple theory of what leads to a stable deterrent relationship between two states. Mearsheimer argued that when State A fields a deterrent capability sufficient to defeat State B, State B will be deterred from attacking State A.[2] The theory is a reasonable one on its face (though we might think of exceptions, such as Georgia's decision to attack Russia in 2008). The causal relationship of Mearsheimer's theory might be stated as follows: *dominant conventional military capability vs. B → stable deterrence vs. B.*

Stephen Van Evera warns against a number of potential errors in determining causation.[3] The most important of these is *spurious causation*. This occurs when the incidences of both A and B are reliant on some other factor, rather than one causing the other. In this case, A and B are not causally related, but instead both rely on a third cause: *C → both A and B.*

An example of spurious causation would be arguing that the crash of an F-16 was caused by the ejection of the pilot. Since ejections are often closely correlated with fighter airplane crashes, an investigator (albeit a poorly informed one) with no understanding of the subject might be forgiven if he speculated that it was the ejection that primarily caused the crash. This is possible, of course; in the absence of mechanical problems, a decision by the pilot to eject would cause the plane to crash. However, it is far more likely that the two events, A (ejection of the pilot) and B (crash of the airplane), are both caused by a third event, C (serious mechanical issues with the plane).

The risk of arriving at spurious causal implications in international security is considerable. What may appear a cause may in fact be the effect of a larger cause, just as with the example of the ejecting pilot. The prior reference to the Arab Spring example is most likely this sort of spurious causation. Would the Arab Spring have occurred if the United States had never invaded Iraq, or even Afghanistan? Very possibly so; though it is difficult to prove a negative, I am aware of no instances of those rebelling in Tunisia, Egypt, Syria, or elsewhere who cited the recent histories of Iraq and Afghanistan as their motives. If this line of reasoning is correct, then the assertion that the Arab Spring was caused by evolving democracies in Afghanistan and Iraq is an example of spurious causation (and possibly biased analysis to boot).

A new concept that may have considerable application to the strategic realm is the idea of *multidirectional causality.* Many of the simplified concepts of causality were designed for the physical realm, where causation can be simplified with considerable accuracy in many environments. Gravity causes a stone thrown into the air to fall back to Earth; no other forces are needed to explain this result, and this outcome is easily explained by reference to a single causal factor.

In international environments, however, this is only rarely the case. In fact, we could say an "effect" has an impact on the "cause" all the time in strategic interactions. Returning to the deterrent relationship, suppose again that A has created a stable deterrent relationship with B. This stable deterrent relationship—and, by implication, the decision by B to be deterred—could then have an impact on State A. State A might believe that the stability of the relationship, and the lack of confrontational steps from State B, would allow State A to reduce its military expenditures while still remaining safe.

State A could decide that State B is a candidate for an alliance, or initiate some other change in the relationship; these are only a few of the many impacts that State B could have on State A by engaging in a stable "deterred" relationship with State A. In this respect, the effect has become a cause. Other states—C, D, E, and F—may play a role in determining whether the relationship between A and B is stable, and those states could add further causal complexity. In this sense, with each state being a cause and effect in multiple relationships, and often both cause and effect at once, the concept of multidirectional causality becomes a useful (though daunting) heuristic for illuminating these interactions.

Causal relationships in the strategic realm can be incredibly complex. At the same time, attempting to understand them is necessary to make sense of history. John Lewis Gaddis, for example, attributes the end of the Cold War to two primary causes: the U.S. conventional arms buildup and firm policies of President Ronald Reagan, and the willingness of his Soviet counterpart, Mikhail Gorbachev, to reassess the Soviet Union's geostrategic position and to act boldly based on that reassessment.[4] Many would agree that these factors played a role, but assessing the end of such a dispersed and longstanding rivalry is a most complicated task, even with the advantage of hindsight and vast knowledge of the subject, as Gaddis has relating to the Cold War.

Such complex causal assessments are exactly what we are asking military officers to make when they offer their insights into strategic guidance, contingency planning, and the like. When we ask officers to assess the question "What is the likely threat posed by China in the

near future?" it is precisely this complex causal environment we are asking them to attempt to understand. Assessing intentions is difficult in and of itself, but suppose we assume that China seeks to expand its sphere of influence and control over natural resources. To be sure, the question "What will China do?" is a critical one. But even if we could assess that question accurately, we could not gauge the strategic importance of whatever actions we believe China would undertake without also asking, "What impact will those actions have?" Here, we are assessing causality—the likely effect that specific Chinese actions could have.

Five Steps for Successful Assessment

The Arab Spring example illustrates two issues related to causality that are important for military officers to understand. First, anything we study in international security—an event in history, current crisis, speculative future engagement—is almost always more complex than it seems at first glance. Understanding complex national security events requires simplification, and that simplification has become a routine part of how we assess a strategic situation. Simplification is, in fact, necessary to make almost any sort of command decision. But when the stakes are significant and the time is available, attempting to parse out the causal complexity of a situation is essential.

Second, it is important to be aware of the need to be prepared to change our minds. If we are not open to reassessment of a causal relationship, we run the risk of missing an opportunity to revise an incorrect assessment. General Douglas MacArthur did not believe his advance to the Yalu River would lead to Chinese involvement in the war because he was confident that the Chinese could only manage to send 50,000 to 60,000 troops across the Yalu, a number that would be no match for the United Nations force that was advancing north. MacArthur's inability to remain open to alternative explanations regarding China's likely involvement was at least partly due to the fact he received few unfiltered intelligence reports. MacArthur had a "determination to surround himself with people who would not disturb the dream world of self-worship in which he so often chose to live."[5]

Assess the Full Spectrum of Causal Factors Involved. Since strategic situations are so complex, it is easy to seize upon the first few causal factors that we believe are most important and stop our analysis at this point. In the spirit of Atul Gawande's *The Checklist Manifesto*,[6] below is a list of categories of possible causal factors that could merit consideration:

- actors involved—primary and secondary, possible future actors
- policy choices of relevant actors/governance/political factors
- leaders/advisors/influential individuals
- military factors
- social/cultural/historical considerations
- normative factors/international community
- strategic trends
- regional dynamics
- technology/changes in technology.

The term *normative factors* is a suggestion that we might consider how the relevance or irrelevance of international norms (customs, standards of behavior, and the like) might play on a certain causal analysis. For example, the importance of the sanctity of internationally recognized borders plays a major role in interstate behavior, even though we can point to instances of recent violations (Crimea, for example). The fact that a norm is sometimes violated does not mean it does not have an impact. In the United States, banks are occasionally robbed, but most people know that bank-robbing is illegal, and that belief affects the behavior of most people.

State Your Understanding of the Causal Relationship as Concretely as Possible. By rendering a complex causal relationship into something close to its true complexity, we may stumble on—or, more likely, force ourselves to recognize—a causal link that seems dubious on further analysis.

Consider this excerpt from a National Intelligence Estimate (NIE) that was read to President John F. Kennedy days before he decided to proceed with the Bay of Pigs operation in 1961. This NIE was seen as supporting the expected causal relationship that the invasion would spark an anti–Fidel Castro popular revolt. Of course, the Bay of Pigs invasion was a disastrous failure, one that humiliated the new President. The NIE went as follows:

The great mass of Cuban people believe the hour of decision is at hand. . . . They expect an invasion to take place before mid-April 1961 and place great reliance on it. The Castro regime is steadily losing popularity. . . . housewives and servants must stand in line for hours to obtain such necessities as soap and lard. . . . Church attendance is at an all-time high as a demonstration of opposition to the government. . . . It is generally believed that the Cuban Army has been successfully penetrated by opposition groups and that it will not fight in the event of a showdown.[7]

Though much of this is simply questionable intelligence, the excerpt also offers evidence of questionable causal relationships, as this NIE was evaluating the possibility of an anti-Castro uprising. What is the causal connection between soap lines and a readiness to spontaneously revolt? Even if a revolt occurred, would it occur quickly enough? How could we predict these critical elements of a plan? When does dissatisfaction lead to resistance? What are the obstacles to mobilizing a revolt? By asking these and other questions in an attempt to make the predicted causal relationship as concrete as possible, we increase the likelihood of identifying aspects of a causal relationship that merit further consideration.

Stay Alert to the Length of the Causal Chain. When we consider a causal impact such as "U.S. military policy A will have causal result B," we must remain alert to each step in the causal chain. The more distant the event is from the cause being investigated, the more likely it is that other causal factors will have an opportunity to affect the event we are attempting to explain.

Eight hundred female strikers for peace on 47th Street near United Nations Building in New York, 1962 (Library of Congress/Phil Stanziola)

There are two general types of "links" in the causal chain that can be considered. The first is *events*. The larger the number of external events between the cause and effect we are interested in explaining, the greater the possibility that other factors play a role in the explanation of the event in question.

The second is *time*. Even absent events that raise the possibility that other causal factors are at work, time itself can add to our skepticism that a causal relationship exists, or at least may cause us to question the strength of the suspected cause. Events in the strategic realm are not always instantaneous to be sure. But a significant span of time between a cause and effect is reason to be skeptical.

For example, it was argued in the 1990s that North Atlantic Treaty Organization (NATO) expansion could raise profound security concerns for Russia.[8] Two decades later, in response to fears that Ukraine was becoming too close to the West, Russia invaded Crimea, and Ukraine continues to be a focus of diplomatic friction between a former superpower and the West.

Did NATO expansion cause the current impasse? It is worthwhile to keep in mind that both a considerable span of time and range of actions occurred between the two events. The 2008 war between Georgia and Russia, for example, may have played a significant role in Vladimir Putin's thinking—offering him evidence that the West would not take significant action to defend a non-NATO member that bordered Russia. Decisions related to the extent of NATO's expansion could have played a role as well—for example, could NATO have halted the expansion at an earlier stage? If the answer is yes, then we might be more skeptical that the earlier decision to expand NATO led to the current situation in 2014. These are the sorts of alternate explanations that would merit consideration as we evaluate a causal relationship.

Realize Causal Comparisons with Past Events Are Always More Complicated Than They First Seem. In March 2014, both Zbigniew Brzezinski and Madeleine Albright offered interviews in which they attempted to suggest possible causal outcomes in the Crimean situation by making historical references. Brzezinski recommended threatening Russia with "very serious" consequences "because, otherwise, some years from now, we will be regretting failure to act the way we regretted the failure to act after Munich in 1938 and 1939, and we know what followed."[9] Similarly, Albright offered, "I think the problem of Munich was that the United States was not paying attention."[10]

Such efforts to predict causal outcomes for present situations based on historical events always gloss over a vast array of causal complexities. Also keep in mind that we are often still puzzling over the causal explanation of the *original* historical event. The outbreak of World War I is now a century old, and there are still potent debates over the role of the cult of the offensive and other factors.[11] And we know even less about the causal factors at work in current geostrategic situations than we do about historical events.

Below is a partial list of "categories of difference" that might be kept in mind as historical analogies are being compared. In effect, we might ask if the historical event and current situation differ in terms of:

- geostrategic environment
- leadership
- regional actors
- cultural and social considerations

- motivation and commitment (short and long term)
- level of threat.

Beware of Mirror-Imaging. Mirror-imaging refers to the danger of assuming that other individuals have the same, or very similar, desires and perceptions that we have. Just as a mirror reflects us, mirror-imaging suggests the danger of projecting our strategic preferences onto another actor. For example, in the prelude to the 1973 war between Israel and Egypt, Israeli intelligence delayed mobilization in part because there was an assumption that Egypt would not attack until its air defense problem had been solved—because Israeli leaders would have been restrained from attacking, in their opinion, had they faced such a situation.[12]

In this sense, there may be a great difference between how an American official would react to a particular policy and how other individuals and other nations might react in the same situation. In assessing the causal implications of a policy, a strategy, or a particular move by us or an adversary, beware of assuming that the adversary reacts as we would or that the measures our adversary is taking are motivated in the same way that ours would be if we had taken such measures.

The earlier reference to the idea that a liberated Iraq could be a "beacon of democracy" may serve as an example of mirror imaging. The "beacon" concept suggests the following assumptions:

- Middle Eastern populations are unhappy with their governments because they are not democratic.
- The same populations read media accounts to learn about alternatives.
- When they decide on which political changes to endorse in their own countries, they do so after being significantly influenced by events in other countries.
- They emphasize the positive and discount the negative news coming out of Iraq.

Toward a More Complex Future?

As difficult as it is to engage in causal prediction and causal assessment in the present, there are reasons to wonder if it will become still more complex in the future. U.S. national security policy continues to assess counterterrorism as a major focus in the decade-plus after 9/11, and this focus raises additional potential for causal complexity.

A major reason for this is the role of individuals. Terrorism is a threat posed by small groups, many (but not all) of which are not dependent on outside actors for direct support or guidance. As such, these groups are able to choose actions while being unencumbered by the institutional bureaucracy that could have a stabilizing effect on state government policies. This increases the complexity of causal assessment and prediction since it increases the fluidity of decisionmaking on the part of these (relatively) small organizations.

Furthermore, predicting social movements—especially social movements fueled by rapid communications technology and social media—is a complicated task. Consider the comments of Director of National Intelligence James Clapper on the subject of predicting the Arab Spring. Clapper spoke positively about the ability of the U.S. Intelligence Community to track social unrest in general. But he added, "Specific triggers for how and when instability would lead to the collapse of various regimes cannot always be known and predicted. . . . We are not clairvoyant."[13]

Nor can we be. But being alert to the causal complexity of the national security environment is a first step, and an important one. Leaving causal assumptions unstated raises the risk of taking action in the strategic realm that is founded on inaccurate expectations of causal relationships. Exploring potential vulnerabilities in our causal reasoning is by no means a guaranteed bulwark against error, but the complexity of today's strategic environment demands it. **JFQ**

Notes

[1] Steven Sloman, *Causal Models: How People Think About the World and Its Alternatives* (Oxford: Oxford University Press, 2005), 21–22.

[2] John J. Mearsheimer, *Conventional Deterrence* (New York: Cornell University Press, 1983).

[3] Stephen Van Evera, *Guide to Methods for Students of Political Science* (New York: Cornell University Press, 1997), 8.

[4] John Lewis Gaddis, *We Now Know: Rethinking Cold War History* (New York: Clarendon Press, 1997).

[5] William Stueck, *The Korean War: An International History* (Princeton: Princeton University Press, 1995), 107, 112.

[6] Atul Gawande, *The Checklist Manifesto: How to Get Things Right* (New York: Picador, 2009).

[7] Richard Reeves, *President Kennedy: Profile of Power* (New York: Simon & Schuster, 1993), 80–81.

[8] For an early article in the North Atlantic Treaty Organization expansion debate, see Ronald D. Asmus, Richard L. Kugler, and F. Stephen Larrabee, "Building a New NATO," *Foreign Affairs* (September/October 1993).

[9] Fareed Zakaria, "Ukrainians Reacting to Russia's Military Movement in Crimea," *CNN.com*, March 2, 2014, available at <http://transcripts.cnn.com/TRANSCRIPTS/1403/02/fzgps.01.html>.

[10] Ibid.

[11] Kier A. Lieber, "The New History of World War I and What It Means for International Relations Theory," *International Security* 32, no. 2 (Fall 2007).

[12] Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: Vintage Books, 1991), 114–117.

[13] "U.S. Intelligence Official Acknowledges Missed Arab Spring Signs," *Los Angeles Times*, July 19, 2012.

Chairman walks with Major General Frederick M. Padilla, USMC, after change of command ceremony in which Major General Padilla became 15th president of National Defense University, November 2014 (NDU/Katherine Lewis)

Next Steps for Transforming Education at National Defense University

By Christopher J. Lamb and Brittany Porro

National Defense University (NDU) is implementing major reforms in the graduate-level programs it provides senior military officers and other national security professionals. If all goes as planned, the result will be a transformation in the way the university educates senior national security leaders.[1] This article does not review the status of current change initiatives. Instead, it looks beyond the changes under way for the 2014–2015 academic year and identifies future steps senior leaders might consider in order to maintain momentum for the transformation of joint professional military education.

The basic rationale for the change at NDU is that in a period of declining defense budgets and increasingly complex security challenges, the Nation needs the best strategic leadership possible. By extension, we need the best possible

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Table 1. Senior War College Problem Areas According to Critics

Sources Evaluating Adequacy of Joint Professional Military Education (JPME)	Institutional Problems: Who Teaches What, How, and to What End?				Systemic Problems: Support for and Management of JPME	
	Faculty	Curriculum	Methods	Rigor	Support	Leadership
Cronin (2010)	X	X	X	X	X	X
Government Accountability Office on DOD JPME study (2013)		X				
House Armed Services Committee study (2010)	X	X	X			X
Johnson-Freese (2012, 2014)	X	X	X	X	X	X
Reed (2011, 2014)	X			X		X
Ricks citing Daniel Hughes (2011)	X			X	X	
Scales (2010)	X		X		X	X
Wiarda (2011)	X	X		X	X	X

Sources: *Another Crossroads? Professional Military Education Two Decades after the Goldwater-Nichols Act and the Skelton Panel* (Washington, DC: U.S. Government Printing Office, 2010); Patrick M. Cronin, "PME: A Strategic Education," *Marine Corps Gazette* 94, no. 6 (2010); *Joint Military Education: Actions Needed to Implement DoD Recommendations for Enhancing Leadership Development: Report to Congressional Committees*, 2013; Joan Johnson-Freese, "The Reform of Military Education: Twenty Five Years Later," *Orbis* 56 (Winter 2012); Kevin P. Kelley and Joan Johnson-Freese, "Getting to the Goal in Professional Military Education," *Orbis* 58, no. 1 (2014), 119–131; George E. Reed, "What's Wrong and What's Right with the War Colleges," *DefensePolicy.org*, July 1, 2011; George E. Reed, "The Pen and the Sword: Faculty Management Challenges in the Mixed Cultural Environment of a War College," *Joint Force Quarterly* 72 (1st Quarter 2014); George E. Reed, "Examining the War Colleges: An Administrative Perspective," conference paper presented at the Reforming Professional Military Education: A Clash of Professional Ethics session at the International Studies Association Annual Conference, San Francisco, CA, April 5, 2013; Thomas Ricks, "Need Budget Cuts? We Probably Can Start by Shutting the Air War College," April 11, 2011; Ricks cited Daniel Hughes chapter in Douglas Higbee, *Military Culture and Education* (Farnham, United Kingdom: Ashgate, 2010); Robert H. Scales, "Too Busy to Learn," U.S. Naval Institute *Proceedings* 136, no. 2 (2010); Howard Wiarda, *Military Brass vs. Civilian Academics at the National War College: A Clash of Cultures* (Lanham, MD: Lexington Books, 2011).

educational program for emerging strategic leaders. General Martin Dempsey, Chairman of the Joint Chiefs of Staff, argues that developing capable future leaders is the best hedge against an austere and uncertain future. Good leaders, he notes, can "see us through when our organizational structure is not perfect, when technology comes up short, when training misses the mark, and when guidance is late to need." In the future, leaders who can think through complex problems, out-think adversaries, reconcile context, uncertainty, and surprise, and seek and embrace adaptability will be "our decisive edge."[2] Producing such leaders is General Dempsey's intent and NDU's current ambition, but there are challenges to overcome.

A substantial body of recent work argues that the traditional approach to joint professional military education needs reform, particularly at the war college level. Criticisms fall into two categories (see table 1). Most attention is paid to immediate institutional issues: namely, who teaches what, how, and with what qualifications, degree of rigor, and efficacy. There are also broader, systemic concerns about the way military culture and leaders manage joint educational institutions and programs. We review these criticisms to better explain how the changes taking place at NDU can improve the educational experience for students and, more importantly, why additional steps to reinforce and extend the changes are necessary.

War College Critics and Reformers

Critics assert that war colleges and universities fail to attract top-flight faculty, teach outdated curricula, no longer pioneer or use innovative teaching methods, and pamper rather than challenge students (see table 2).[3] Critics further contend that with a few exceptions, war college classes are pass/fail experiences where everyone passes, and performance at the colleges matters little to parent Services.

Most critics argue these conditions persist for reasons beyond the immediate control of the colleges and their faculties. They believe an anti-intellectual military culture devalues education and disinclines students and college administrators to pursue education rigorously.[4] Major General Robert Scales, USA, for example, argues that Service cultures do not value education enough to send the best and brightest officers to teach and claims the war colleges have become "intellectual backwater[s], lagging far behind the corporate and civilian institutions of higher learning."[5] The Goldwater-Nichols Department of Defense Reorganization Act of 1986 makes joint assignments and promotion to general and flag officer contingent upon senior military education, so a steady flow of students to the war colleges is assured. However, longtime war college faculty members such as Joan Johnson-Freese of the Naval War College worry that the disdain for education in military culture diminishes student motivation to learn.[6]

Moreover, administrators who run military educational institutions come from the same culture and rarely are inclined to challenge it. War college commandants have short tenures and typically retire after their terms, so there is little incentive or opportunity for them to challenge the status quo. These factors make reform from within an unlikely prospect.

Table 2. Top Performance Issues as Identified by Critics

	Institutional Issues: Who Teaches What, How, and to What End?				Systemic Issues: Support and Management of Joint Professional Military Education (JPME)	
	Faculty	**Curriculum**	**Methods**	**Rigor**	**Value of JPME**	**Support and Management**
Summary of Major Criticisms	Active Duty: Services do not send top talent; thrown into classes unprepared; have short tenures.	Focus: not enough emphasis on critical thinking and leadership skills.	Innovation: lack of innovative teaching methods, particularly to balance demand for generalists and specialists.	Goals: focus is on social goals, not academic excellence.	Culture: Service cultures biased toward action, not reflection; training, not education.	Competency: administrators chosen because of former military careers are not qualified for academic administration.
	Former Military: retired military with PhDs lack published research records and areas of specialization.	Relevance: weak relationship to follow-on duty assignments.	Thinking skills: more focus on "training" (information transmittal) than on critical thinking.	Level of Difficulty: not challenging; no entry requirements; one year is not enough to cover the material.	Partiality: priority is hiring administrators with military, not academic, experience.	Value: burgeoning administrative ranks impose costs without compensatory value.
	Civilians: not attracting top civilian academic talent.	Balance: generalist and specialist models not reconciled.	Intellectual vibrancy: not sufficiently thought-provoking.	Standards: it is pass/fail, and everyone passes; not rigorous.	Personnel Systems: Service human resource requirements trump educational goals.	Tenure: war college presidents leave too quickly to make needed changes.
	Practitioners: too much emphasis on practitioner perspective.	Theory: topical issues emphasized without sufficient attention to theoretical framework.		Social Dynamic: catering to student preferences at the expense of education.	Academic Inquiry: military culture in general clashes with academic culture.	Proponency: no full-time, senior proponent for military education is up to the task.

In the past, Congress has intervened to "fix" military education. One consequence is that existing law and written guidance from the Chairman of the Joint Chiefs now require the war colleges to provide a "rigorous" educational experience. However, a recent House Armed Services Committee study declined the opportunity to take the side of critics who charge lack of rigor. Instead, perhaps cognizant of criticism that Congress has already legislated too many demands on military education, the committee study noted that pass/fail approaches, when based on objective learning standards and supported by comprehensive and timely feedback, do not necessarily detract from the rigor of the academic programs."[7] This arguably sets a low bar, considering the weighty, life-and-death responsibilities war college graduates often shoulder.

Comparing Civilian and Military Institutions of Higher Education

The critiques of joint education over the past decade did not generate a consensus in favor of reform, much less a specific agenda. In part this is because some of the criticism is misplaced. For example, former National War College Professor Mike Mazarr rightly skewers critics for repeating the canard that war colleges focus on tactics at the expense of strategy, observing that "no one with even a glancing familiarity with National War College's curriculum could possibly [think or] write such a thing."[8]

Another reason the reform agenda did not catch on is that critics and proponents of the war colleges tend to talk past one another. The critics start with the assumption that the war colleges should emulate top-tier civilian universities. They recommend tenure for professors, more emphasis on faculty research, and cultural changes to better align with academia, which is "open-minded, free-wheeling, questioning of authority [and] of any and all established truths."[9] Some of these prescriptions seem antiquated given changes in higher education. For example, the value of tenure in civilian higher education increasingly is questioned.[10] The percentage of tenured faculty fell from 37 percent in 1975 to 24 percent in 2003, a trend that has continued over the past decade.[11] Similarly, the right balance of faculty research and teaching duties is debated. George Reed asserts that the "dirty little secret of top tier civilian universities" is that "great, and sometimes inordinate, emphasis is placed on research and publication that can detract from effective teaching."[12] As for academic freedom, it may be easier to question orthodoxy in a war college than in a typical civilian graduate program. Free thinking at civilian universities increasingly is circumscribed by the vagaries of departmental politics,[13] institutional review boards,[14] and political correctness from academic disciplines that are overwhelmingly captured by one portion of the political spectrum.[15]

Those who defend the traditional war college approach typically start with the opposite assumption: that war colleges are unique institutions that should not be judged by or seek to emulate the best graduate programs at top-tier universities.

Reed, with experience in both war colleges and civilian higher education, notes the war college model is "more akin to that of a professional school (for example, law or medicine)." Like lawyers, engineers, and doctors, military officers are sent to senior Service schools to learn a well-established canon of professional knowledge.

It is true that war colleges are professional schools, but that does not explain their lack of rigor. On the contrary, the prevailing pass/fail standard at war colleges is not consistent with the professional school model. Professional schools mandate the acquisition and retention of specialized knowledge and are ruthless in testing whether students meet this requirement—and for good reason. Who wants a doctor who graduated from a medical school where everyone passes? Military culture is not a valid excuse for lack of rigor when it comes to education. At the Service academies, for example, cadets are constantly tested, rank-ordered, and not infrequently flunked, and their performance is directly tied to future assignments and career field selection.

War college practices diverge from established norms at professional schools in other respects as well. Professional schools use experienced practitioners with the gravitas and authority to transfer knowledge in their areas of expertise. Critics acknowledge that war college faculties have some extraordinary talents, but they also argue that too many civilian and military instructors have insufficient experience and academic credentials. They claim top-flight civilian academics are not attracted to war college culture and that uniformed instructors lack experience,[16] academic credentials, and sometimes also practical expertise in the subject areas they are asked to teach. These faculty profiles contradict the professional school model, which emphasizes experienced, expert instructors. As Johnson-Freese notes, in the case of the Army, Air Force, and Marines, it actually is "easier and less competitive to be assigned to a War College as a faculty member than it is as a student."[17] In other words, selection as a student to a war college is competitive whereas assignment as an instructor is not, which means instructors may have less credibility with their students. Scales emphasizes the need for the Services to change their ways and populate the war colleges with experienced, upwardly mobile instructors with long-term immersion in a subject.[18]

Another problem with using the professional school model to explain lack of academic rigor is that it overstates the dichotomy between professional schools and research universities. All graduate-level programs impart established knowledge and teach critical thinking skills. Medical schools want doctors who know not only the basics but also the results of recent research and how to solve uncommon medical problems. Law schools want lawyers who not only know the law but who can also devise creative ways to assist their clients within the bounds of evolving law. War colleges want strategists who understand not only current doctrine but also how to manage emerging national security problems. Thus, as Steven Metz argues, the purpose of the war colleges is actually a mix of professionalism (that is, sharing a body of knowledge related to the military mission) and higher education, which includes developing critical thinking skills.[19]

At issue is the proper balance between professionalism and higher education. In that regard, the consensus has shifted toward greater emphasis on critical thinking skills and less on transferring an existing body of knowledge. Most observers believe most professional military knowledge is better transferred earlier in officers' careers when they attend command and staff colleges.[20] The war colleges are supposed to focus on higher order strategic problems and question established ways of doing business, particularly during periods of great change when the value of traditional methods and approaches is suspect.[21] This is precisely the point that General Dempsey and many other senior leaders have been making in recent years: the war colleges need to impart the critical thinking skills that will allow future leaders to adapt and perform well in a dynamic, complex security environment.

Critics argue that innovative methods are needed to impart critical thinking skills. The traditional reliance on the Socratic method of open seminar discussion moderated by faculty has its advantages but falls short as a means of replicating complex problem-solving under stress, an essential requirement for strategic leaders. They believe the customary Socratic approach should be augmented with more advanced simulations and crisis decisionmaking exercises to better prepare students for future strategic leadership challenges.

Typically, the deviations from professional school norms and outright contradictions in the traditional war college model are attributed to a military culture that favors its own members at the expense of civilian faculty. War colleges often (but not exclusively) hire retired military officers with doctoral degrees as administrators. At NDU in 2014, for example, the chancellors of the College of International Security Affairs and *i*College as well as the deans of the Eisenhower School and National War College were all retired military colonels or Navy captains holding doctorates and having substantial professional military education experience, as were the university provost and director of research. (In addition, the commandants of the National War College, Eisenhower School, and Joint Forces Staff College are Active-duty flag officers.) Critics may see this as favoritism, but military leaders understandably want war college administrators who comprehend military culture, professional requirements, and modes of operation. A natural byproduct is that the war colleges are inclined to give students the maximum latitude to determine how much effort they put into their education rather than "coercing" them with grades, tests, and onerous reading lists. The net effect is an educational experience that, while impressive in some respects, lacks the rigor typically associated with top civilian graduate programs.

A Better War College Model

Powerful cultural factors prevent the war colleges from fully emulating civilian research universities, and in some

Table 3. The NDU Educational Transformation Strategy

Elements	Attributes	Value
Student Assessment	Reviews with faculty mentors across NDU	Tailored experience, motivated students, distributed mentoring burden
	Multiple progressively difficult educational tracks	Meet student demand without watering down rigor
	Topics of individual interest identified	Allows construction of elective schedule tailored to student demand
	Individual learning plans	Self-conscious goal-setting; basis for student learning assessments
	End-of-year student self-assessments	Identifies areas for improvement and continuing education plan
	Continuing learning plan for the student	Students continue to learn after 10-month program
Phase I	NDU-wide core curriculum	Identifies core priorities for national security professionals
	Foundational material	Logical building block; less redundancy
	Chairman of the Joint Chiefs of Staff content added	Prepares for complex security environment
	Taught by NDU-wide best talent	Students receive the best NDU can offer
	Students pair with others from different profiles	Expands student learning perspectives from start
	Exploit Washington, DC, location for experiential learning	Gives students memorable practical insights
Phase II	College core curricula	Students benefit as colleges concentrate on core competencies
	Colleges hire/focus faculty on expertise	
Phase III	Tailored to student needs	Individualizes student research experience
	Electives to support research and student careers	Increases chances students can focus on relevant, specialized research topics
	Research projects under direct faculty mentorship	Students demonstrate problem-solving capability using critical learning skills
	Optional travel in support of research projects	Students control research design and maximize ability to generate good products
	Mentors are best experts from across university	Students receive the best that the university has to offer
	Thesis for those pursuing master's degree	Elevates the rigor of a 1-year graduate program for a degree
Program Evaluation	End of year program evaluations	Empirical feedback permits objective program improvements
	Learning-based feedback from students	More objective assessment
	Feedback from "customers"	Provides critical perspective from objective source
	Evaluations managed outside of components	Facilitates objectivity
Common Academic Calendar	Common annual calendar	Permits collaboration among all NDU components
	Common class lengths	Facilitates taking classes in other colleges consistent with student learning plans
	Common times for no classes	Permits students to get the best from full range of activities at NDU

respects that is a good thing. The war colleges are always going to respect and reflect military service and values, as they should. They also are going to be populated with students who often value practical experience more than reflection and research and who are assigned to the war colleges rather than selected as the most likely to succeed in the halls of higher education. Students at civilian universities compete for positions in graduate programs and pay hefty tuitions to obtain their graduate educations, so they are highly motivated to succeed and exploit their investments. They also have a wide choice of institutions and programs to choose from to best meet their personal needs and goals. Officers assigned to war colleges must attend, and a good percentage—the numbers are debated—may undervalue the opportunity. It is not uncommon to hear war college faculty guesstimate that one-third will end up valuing and profiting from their educational experience, another third will just meet the requirements as necessary, and the final third will never really engage or exploit the opportunity.

Since most experts on adult education agree student motivation is the greatest single determinant of learning outcomes, any predisposition to doubt the value of higher education is a significant hurdle to learning. This makes the war college professor's job difficult. The onus is on the institution to capture the interest of the students and motivate them to learn. Given these realities, many people who teach at the war colleges believe they must woo students with stellar classroom efforts and hope the inherent professionalism of the U.S. military will incline its charges to get as much from the classroom experience as possible.

For example, this is the case Mazarr makes in rebutting the "lack of rigor" charge made against the war colleges. He argues graduate students anywhere can take a half-hearted approach to education: "Graduate school is like that. Really smart folks can sample a little stuff, stay mostly quiet, binge for exams, and get by." He believes the vast majority of U.S. military professionals refuse to do that and consequently get a lot from their war college experience. It is doubtful

that graduate students can loaf their way through programs at top universities where entry is extremely competitive and successful completion not at all assured. Fewer than half of all admission applications to master's programs are accepted,[22] and fewer than half of all doctoral students finish their degrees.[23] Data for completion rates for master's degrees are harder to come by and tend to focus on science and technology degrees, but one study indicates a completion rate of about 66 percent.[24] By contrast, informal discussions with many who have attended and taught at the war colleges reveal deep skepticism about the assertion that the "vast majority" of military students are too professional to skate through a no-fail system, especially given competing demands on their time and the fact that the program offered to students is not tailored to their specific needs.

One hopes Mazarr is right, but other inside observers have expressed the opposite concern, arguing that "students who maximize the learning experience at the war college are in a decided minority."[25] Thus, many conclude we must do better than the traditional war college model, which inconsistently adopts the practitioner focus of professional schools without the faculty and rigor such schools typically demand. General Dempsey holds this view. He charged leaders at NDU to "break out" from established ways of doing business and directed the "transformation of joint professional military education programs."[26] The response was a plan that markedly increases student choice and thus student motivation to learn.

NDU Education Transformation Plan

National Defense University's education transformation plan is explained elsewhere[27] but can be briefly summarized to illustrate how the university is moving forward from the traditional model of military education (see table 3). The plan has six major elements, the first of which is a comprehensive student evaluation that takes into account individual student circumstances, previous education, career paths, and interests. Faculty mentors help students craft an academic program that will meet their individual needs and then work with the student to monitor results over the year. The next three elements restructure curriculum into different phases: a common core curriculum that provides a foundation of knowledge necessary for any graduate-level national security student, a second phase that delivers the core curricula that each of the five colleges specializes in and allows the colleges to offer students greater depth of expertise in those areas of specialization, and a third phase that focuses on electives and research that students can tailor to meet their personalized learning objectives. The fifth element in the overall plan is detailed program evaluations based on student self-evaluations and reviews from the organizations that benefit from receiving war college graduates. These empirically based evaluations would enable better management of the overall educational experience, including faculty development programs. The last element is a common academic calendar that facilitates collaboration across campus and better allows students to attend the many diverse educational opportunities at NDU.

The entire NDU transformation plan is intended to be student-centric. Rather than forcing all students into a single, common program irrespective of their individual career paths, desires, and future objectives, this approach explicitly embraces diversity, expanding the choices available to students and inviting them to participate in managing their own education. The entire approach is consistent with well-acknowledged principles of successful adult education, which emphasize partnering with students, taking their unique circumstances into account, linking the educational experience to their career needs, and tapping the internal as opposed to external factors that typically motivate adults to learn.[28]

Table 3 depicts the advantages that should accrue from the program as originally envisioned. In practice, the program is being modified during implementation as necessary to accommodate limited resources (such as time, staff, and faculty). Opposition by some teaching faculty has also played a role in diluting or limiting the scope of the transformation effort in its inaugural stages. Reworking the curricula, programs, and standards to give students more choices and instituting systems for empirical feedback on staff and student performance are demanding tasks. The best way to ensure success is to retain sight of the original strategic logic underlying the transformation plan and to carry that logic forward in successive iterations of the academic program.

Extending the Diversity Logic

To realize the promise of a better educational experience for students, NDU can advance its change program in three areas. In each case, the university could offer more diversity that will facilitate its burgeoning commitment to a student-centric approach. The new program currently being implemented was designed to enhance diversity by allowing students to have a greater say in structuring their graduate programs. The university needs to reinforce this trend over time.

First, NDU should create a variety of graduate-level educational tracks for students, including a doctoral program. Doing so would further circumvent the contradictions that previously handicapped the ability of the war colleges to offer an exceptional educational experience. Relatively speaking, for many years, professional military education has been "one size fits all" with several negative consequences. A regimented approach inclines the war colleges to treat all faculty the same regardless of qualification, which undermines quality; reduces student motivation by forcing students to devote too much time to material they know is not relevant for their particular career path; and ultimately requires the watering down of educational standards. Standards are kept low to accommodate students who—often for good reasons—cannot manage a typical graduate program full of tests, papers, exams, and other hurdles but who also cannot be allowed to fail. Providing students with

multiple educational tracks—directed study, certificate, graduate degree, honors, doctoral candidate—with different levels of difficulty tailored to student needs and interests allows university leaders to set and insist on standards appropriate for each path.

For example, students interested in particularly challenging issues in their career fields could focus singularly on those issues without being constrained by master's degree requirements. Perhaps these students already have a graduate degree and know they will not become a flag officer, but would value the opportunity to solve a problem that has repeatedly surfaced in their careers. Alternatively, students with no graduate degree who aspire to promotion might want master's degrees in strategy to maximize their chances for advancement. Still other students already in possession of master's degrees might aspire to publish their theses and ask for honors tracks and chances to compete for scarce slots in doctoral programs. Embracing student choice acknowledges the reality of different student abilities and aspirations and also the preferences of mid-career learners. It balances the need to educate both generalists and specialists, gives war college students a chance to get the most from their graduate experience, and helps mid-career professionals take the next step toward becoming senior leaders. Allowing students to choose the best fit for their circumstances will increase student motivation to learn, which is the key to success in adult education, particularly for seasoned professionals on well-defined career tracks.

Second, NDU needs a guiding theory and approach to adult education that informs its graduate programs.[29] The Socratic method alone does not constitute an optimum approach to adult education. A hybrid approach that supports a commitment to student-centric graduate education can better serve the target population. The war college foundational approach could and should be a humanist approach that emphasizes the importance of meeting the student's full range of needs: emotional, spiritual, physical, and intellectual. During student assessment, all the factors affecting the students' needs and motivations to learn are considered to craft programs of study that will maximize chances for students to emerge at the end of the year better prepared for their follow-on assignments.

In the first phase of the curricula, which is short and focused on transferring foundational material (mandated by legislation and Joint Staff guidance) to students, the guiding approach should be social learning where students dialogue with colleagues, network, conduct team projects, and demonstrate they have acquired knowledge of material by passing "no-fail" online exams they can take at their leisure. The idea would be to transfer basic knowledge while exposing the students to other points of view about the significance of the material. During this period, students would have a chance to decompress from the taxing operational assignments they complete prior to arriving at National Defense University.

The approach taken in the second phase would depend on the student's educational track, but if the student is pursuing a master's degree, it should be a behaviorist approach with well-identified learning objectives and graded papers and examinations.

The third phase, focused on student research, should be administered with a cognitive approach that emphasizes sense-making, problem-solving, and self-directed learning via case studies, projects and simulations, and papers. Mentors should assist students in setting up their research problems and constructing appropriate methodologies to solve the problems, but the level of difficulty would depend on the topics and educational tracks chosen by students. Such a hybrid approach to adult learning would permit university staff and faculty to better administer the new program in a way that supports multiple educational tracks for students.

Finally, the university needs to embrace and rationalize its faculty diversity. War colleges, with their relatively generous salary structures, are well positioned to recruit faculty with both impressive practical and academic credentials. However, there will always be a mix of Active-duty military personnel, retired military with academic credentials, and civilians with senior-level experience in the national security system. With rare exceptions, civilians with no practitioner experience ought to be avoided in professional schools such as the war colleges. The main point is that rather than treating all instructors largely as interchangeable cogs in a teaching machine, the university should distinguish between levels of qualifications and categorize faculty and their duties accordingly. The war colleges already distinguish faculty by titles and offer some assistance and mentoring to new instructors thrown into the classroom, but we are suggesting a much tighter alignment of experience and expertise with teaching responsibilities.

Although there would be exceptions, in general assistant professors would help administer the educational program as team teachers, graders, and program administrators; associate professors would teach the lower level courses; and full professors would teach mostly higher level courses in their area of demonstrated expertise. Full and distinguished professors would mentor doctoral candidates, and so on. Uniformed faculty without academic credentials or exceptional experience in the subject matter would begin in the assistant professor category and move up as they benefit from faculty development efforts, experience, and research. Deeply experienced practitioners (military and civilian) would lead those classes in which their practical experience is clearly relevant. If they stay on and publish, they could rise and be assigned more traditional academic and research duties. There would be no tenure, but full professors would have more time for research and control over their course content.

General Dempsey gave National Defense University a chance to be the first military institution of higher education to break away from the model of military education that critics have been assailing for the past decade. The new program under way at the university is a clear step in the right direction. It requires modifying the curricula, programs, and standards to give students more

choices and instituting empirical feedback on staff and student performance—all difficult tasks. It will be tempting to compromise to make the program less stressful for staff and faculty. Change can be hard, but it is important to remember that the first, most difficult steps already have been taken. What is most important now is to maintain momentum toward a better and more challenging war college experience for the next generation of strategic leaders. JFQ

Notes

[1] Gregg F. Martin and John W. Yaeger, "'Break Out': A Plan for Better Equipping the Nation's Future Strategic Leaders," *Joint Force Quarterly* 73 (2nd Quarter 2014), 39–43.

[2] "From the Chairman: Building Tomorrow's Leaders," *Joint Force Quarterly* 67 (4th Quarter 2012).

[3] The term *war college* is used here to encompass both senior-level Service colleges, including the Air War College, Army War College, Naval War College, and Marine Corps War College, and senior joint professional military educational institutions, including the National War College, Dwight D. Eisenhower School for National Security and Resource Strategy, Joint and Combined Warfighting School, and Joint Advanced Warfighting School at Joint Forces Staff College.

[4] Milan Vego offers good insights on military culture, anti-intellectualism, and creative thinking in his article, "On Military Creativity," *Joint Force Quarterly* 70 (3rd Quarter 2013), 84.

[5] Robert H. Scales, "Too Busy to Learn," U.S. Naval Institute *Proceedings* 136, no. 2 (2010), 2.

[6] Joan Johnson-Freese, "The Reform of Military Education: Twenty-Five Years Later," *Orbis* 56 (Winter 2012).

[7] U.S. House of Representatives, Committee on Armed Services, Subcommittee on Oversight and Investigations, *Another Crossroads? Professional Military Education Two Decades after the Goldwater-Nichols Act and the Skelton Panel* (Washington, DC: U.S. Government Printing Office, April 2010), available at <http://democrats.armedservices.house.gov/index.cfm/files/serve?File_id=d4748d4a-b358-49d7-8c9a-aa0ba6f581a6>.

[8] Mike Mazarr, "Disruptive Thinkers: The PME Debate Needs More Informed Thinkers," *Small Wars Journal*, April 13, 2012.

[9] Howard Wiarda, *Military Brass vs. Civilian Academics at the National War College: A Clash of Cultures* (Lanham, MD: Lexington Books, 2011), 153.

[10] The debate over tenure is longstanding, but a representative case against tenure is found in James C. Wetherbe, "It's Time for Tenure to Lose Tenure," *Harvard Business Review*, March 13, 2013, available at <http://blogs.hbr.org/2013/03/its-time-for-tenure-to-lose-te/>.

[11] Mark Purcell, "Skilled, Cheap, and Desperate: Non-Tenure-Track Faculty and the Delusion of Meritocracy," *Antipode* 39, no. 1 (2007), 121–143; Robin Wilson, "Tenure, RIP: What the Vanishing Status Means for the Future of Education," *The Chronicle of Higher Education*, July 4, 2010; "Faculty Not on Tenure Track Rises Steadily Over Past 4 Decades," National Public Radio, February 20, 2014, available at <www.npr.org/2014/02/20/279987644/faculty-not-on-tenure-track-rises-steadily-over-last-4-decades>.

[12] George E. Reed, "Examining the War Colleges: An Administrative Perspective," conference paper presented at the Reforming Professional Military Education: A Clash of Professional Ethics session at the International Studies Association Annual Conference, San Francisco, CA, April 5, 2013, 6.

[13] Here again, tenure is not seen as particularly helpful. As one commentator notes, those seeking tenure are often counseled to "avoid risk, collegial work, and even their students" to improve their chances of acquiring it. See Ernst Benjamin, "Some Implications of Tenure for the Profession and Society," American Association of University Professors, available at <www.aaup.org/issues/tenure/some-implications-tenure-profession-and-society>.

[14] Philip Hamburger, "The New Censorship: Institutional Review Boards," *Supreme Court Review* 271 (2004).

[15] Tom Bartlett, "Social-Psychology Researchers Are Very Liberal. Is That a Problem?" *The Chronicle of Higher Education*, July 30, 2014. See also John Tierney, "The Left-Leaning Tower," *The New York Times*, July 22, 2011, available at <www.nytimes.com/2011/07/24/education/edl-24notebook-t.html?pagewanted=all&_r=0>.

[16] Proponents of the current system often assert military officers are experienced because teaching is inherent in leadership. Critics disagree, arguing that teaching is a profession with attendant skills, not just a subset of leadership. One observer who has taught in half of the six joint professional military education granting courses at National Defense University (NDU) over an 8-year period notes there is "no serious faculty development program" available to uniformed officers thrown into the classroom. They learn by doing; "you just figure it out yourself." Email to authors from experienced faculty member at NDU, September 18, 2014.

[17] Joan Johnson-Freese, *Educating America's Military* (London: Routledge, 2013), 71.

[18] Scales.

[19] Steven Metz, "Strategic Horizons: U.S. Professional Military Education on the Chopping Block," *World Politics Review*, April 17, 2013, available at <www.worldpoliticsreview.com/articles/12879/strategic-horizons-u-s-professional-military-education-on-the-chopping-block>.

[20] For example, a major finding in *Another Crossroads?* was that "there is an increasing need for additional joint and service-specific subject matter to be taught earlier in officers' careers."

[21] By policy, the intermediate joint professional military educational institutions focus on "warfighting within the context of operational art" and senior schools "prepare students for positions of strategic leadership and advisement." See Chairman of the Joint Chiefs of Staff Instruction 1900.01D, "Officer Professional Military Education Policy," July 15, 2009, CH I, December 15, 2011, A-A-4, A-A-5.

[22] Council of Graduate Schools, "Graduate Enrollment and Degrees 2002 to 2012," available at <www.cgsnet.org/ckfinder/userfiles/files/GEDReport_2012.pdf>.

[23] Council of Graduate Schools, "Ph.D. Completion Project," available at <www.cgsnet.org/phd-completion-project>; see also "U.Va's Ph.D Graduation Rate in Line with National Average," April 29, 2001, available at <www.virginia.edu/insideuva/textonlyarchive/92-04-01/2.txt>.

[24] Although "master's education is the fastest growing and largest component of the graduate enterprise in the United States . . . little is known about completion and attrition rates." See Council on Graduate Schools, "Master's Completion Project," available at <www.cgsnet.org/masters-completion-project>.

[25] A former National War College student and professor.

[26] Martin E. Dempsey, "From the Chairman: Investing in the Minds of Future Leaders," *Joint Force Quarterly* 74 (2nd Quarter 2014).

[27] Martin and Yaeger.

[28] Malcolm S. Knowles, *The Adult Learner: A Neglected Species* (Houston, TX: Gulf Publishing Company, 1990), 57–63. More than two decades later, the principles articulated by Knowles remain the bedrock of adult education theory. See Malcolm S. Knowles, Elwood F. Holton III, and Richard A. Swanson, *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development* (Amsterdam: Elsevier, 2005).

[29] Sharan B. Merriam and Rosemary S. Caffarella, *Learning in Adulthood: A Comprehensive Guide* (San Francisco, CA: Jossey-Bass Publishers, 1999).

U.S. Army Sergeant 1st Class Melvin Morris receives Medal of Honor from President Obama inside White House, March 2014 (U.S. Army/Mikki L. Sprenkle)

A Strong Fighting Force Is a Diverse Fighting Force

By Larry O. Spencer

A strong fighting force is a diverse fighting force. Said another way, diversity equals combat power. Therefore, we should strive to have diversity, both up and down the ranks, because it makes us better. In addition to the benefits of diverse views and opinions, it is important for the top echelon of military leadership to reflect the diversity of the Nation—not to achieve numbers for the sake of achieving numbers, but because young enlisted members and officers need to see a way to top leadership positions if they have the drive and talent to get there.

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Up Close and Personal

I grew up in Southeast Washington, DC. In my neighborhood, and for the most part in my world, there was little diversity. As a kid, I played with African-Americans, went to school with and was taught by African-Americans, went to church with African-Americans, and my role models and heroes were African-Americans. On the surface, I suppose there is nothing wrong with that. In fact, that type of "isolation" within one's own ethnic group or "hood" is not uncommon. In hindsight, however, I realize that so many Americans spending their formative years this way is a problem because America, as a whole, is not represented and its diversity is not highlighted.

As I entered high school, my family moved just across the DC border into Prince George's County, Maryland. At

the same time, societal views were changing about "neighborhood segregation." Attending de facto segregated schools was deemed incongruent with building America's leaders of the future, so the concept of busing was introduced. I was bused to a high school that, even though it was predominantly white (by the way, that statistic was reversed by the time I graduated), it was at least racially diverse.

The concept of disparity was not entirely foreign to me; my mother had told me stories about when she was a sophomore at Moton High School, a predominately African-American high school, in Farmville, Virginia. Concerned about the poor conditions and lack of resources, students (including my mother) protested and the entire student body eventually went on strike. As history records, the Moton High School protests became part of a Supreme Court decision, known as *Brown v. The Board of Education*, which declared segregating schools (known then as "separate but equal") on the basis of race no longer permissible. Following that decision, the Prince Edward County School District decided to withhold funding from *all* county public schools to show its dissent. As a result, my mother did not graduate high school and did not receive a high school diploma until she was in her 40s.

During my formative years, I rarely encountered professionals who looked like me. Whether it was visiting the doctor's or dentist's office or going to a used car lot to buy a car, the doctors, salesmen, lawyers, pilots, military officers (my father was enlisted in the Army), police, firefighters, and store managers were all white. It would not be until much later in life that I understood the impact those images had on my self-esteem.

As I look back, my first day in high school was an eye-opener. To begin, I stepped onto a bus where the students were predominantly white. As a star football player, it was the first time I would play for a white coach, and the equipment and field conditions were better than any I had ever seen. As we began to blend together as one high school, I was exposed to varying ideas and ideologies, including music, that I had not heard before. This was new and intriguing to me as it was to my white classmates. As we debated and discussed various ideas, I was struck by the varying views on a singular issue.

Years later, the infamous O.J. Simpson trial reminded me of these early high school days. When the verdict was announced, there was a large portion of the country that supported the decision and another large portion that was outraged. It always puzzled me how an entire country could watch the same presentation of evidence and reach completely opposite conclusions. But the key takeaway for me was that people from different backgrounds, education levels, and experiences can view a singular problem from varying points of view. Unfortunately, as with the O.J. Simpson trial, diverse opinions will lead to disagreement; however, healthy debate in an organization is not only desirable but also essential to approaching complex problems.

When I joined the Air Force, I began to see the absolute value of diversity and inclusiveness. When I lined up next to a fellow team member in high school, it did not matter what he looked like or where he came from. The only criteria were competence, commitment, and work ethic. Whereas I was taught to block and tackle a certain way, I quickly learned that my way was not the only way, and in many cases, my way was not the best way. The same is true for the Air Force—race or gender does not matter, but competence, integrity, trust, and respect do matter and what we should value most.

In my view, diversity and inclusion have everything to do with success and little to do with numbers. Steve Jobs stated, "A lot of people in our industry haven't had very diverse experiences. So they don't have lots of dots to connect, and they end up with very linear solutions without a broad perspective on the problem. The broader one understands the human experience, the better design we will have." Former Secretary of State and former Chairman of the Joint Chiefs of Staff General Colin Powell stated, "America is a nation of nations, made up of people from every land, of every race and practicing every faith. Our diversity is not a source of weakness, it is a source of strength, and it is a source of our success. The fact that America is the strongest most powerful nation on earth is not an accident and that achievement was not earned by fate. Hard working Americans, from every walk of life, from every race and ethnic group, both male and female, made it that way."

Achieving diversity in senior military positions is a challenge to be sure because, unlike industry, we cannot simply go out and hire a general or flag officer or senior noncommissioned officer. But there are specific actions we can take that are not one-time-only events but rather ones that require constant focus and reinforcement.

Achieving a Diverse Fighting Force

The Air Force has successfully accomplished its mission. Going forward, it is likely that any future conflict the Nation faces will rely heavily on air, space, and cyber power as well as the capabilities of the other Services. And this means we should strive to become even more diverse. Like many organizations, we have norms that tend to support the ideas, culture, and experiences of the majority. While these norms work to help the organization achieve its goals, we must be careful to ensure that they do not also cause the organization to view new or different ideas as countervailing or irrelevant. Diversity forces organizations to understand and accept differences, which fosters a more culturally sensitive workforce that could reduce problems such as discrimination and sexual assault/harassment.

This is more than a conceptual or aspirational discussion because the demographics of the Air Force will change in the near future. As of 2012, the racial breakdown of the U.S. population was 63 percent white and 37 percent minority (17 percent Hispanic, 12.3 percent African-American, 5 percent Asian, and 2.4 percent other). By 2060, the projected U.S. population breakdown will be 43 percent white and 57 percent minority (31 percent Hispanic, 13 percent African-American, 8 percent Asian,

Airman walks perimeter of C-130J Hercules, November 2014 (U.S. Air National Guard/Matt Hecht)

and 5 percent other). More telling, the Air Force is projected to recruit from a population in which the minority is the majority by 2024.

With that said, first, we must *recruit* a diverse population. As I stated, unlike all other employment opportunities in the United States, the military is unable to hire uniformed personnel directly into senior leadership positions. Because of this, the senior leadership candidate pool is directly tied to recruiting efforts. It takes roughly 24 years to develop and season an Air Force general officer. To put a finer point on it, if the Air Force recruiting pool is not diverse today, we will lose the opportunity for a diverse general officer pool for the next 24 years. This means we must make a concerted effort to recruit a military force that represents the American public.

Second, we must *retain* a diverse force. When it comes to a diverse force, retention is merely an extension of recruitment. We can recruit the best folks, but without a good retention strategy, we may not be able to keep them. Obviously, like all decisions in the Air Force, a good retention strategy is based on the Air Force mission. This mission—the deployment of air, space and cyberspace power to achieve political objectives—is expected to remain constant for the foreseeable future. Because of this, the Air Force retention program is essentially the management of the relationship between leadership and the people they lead. The management of this relationship comes down to two things: delivering a clear message that hard work and living Air Force core values are keys to a successful career, and purposeful and focused mentorship.

The Importance of Hard Work

My father was a career Army noncommissioned officer who earned a Purple Heart during the Korean War and went on to serve a full career as an amputee (something that is not uncommon today, but was not the norm in the 1950s and 1960s). He grew up on a farm and learned the value of hard work. He instilled that work ethic in my siblings and me. He often said that he had a high school diploma from his local high school and a Ph.D. from the "school of hard knocks." His philosophy was that one does not have to be the smartest or brightest to get ahead, but absent those things, one must be the hardest worker.

So commanders and supervisors must ensure that everyone understands there are no shortcuts. Our talent, drive, and work ethic will ultimately determine how far we climb up the military rank structure. Natalie Crawford, a senior fellow at and former vice president of RAND Corporation, stated, "As a woman working in an environment dominated by men, I learned quickly that management

will always remember who you are—they remember if you are good and/or they remember if you are not good—so as a woman I had to be good." Is this fair? I am not sure but perhaps it is not. Is this reality? My experience says it is. Along those lines, I have to point out an important fact: no minority member or woman I know ever wants to achieve a position based solely on race or gender. Conversely, everyone I know wants a fair and equal chance to advance in the organization—nothing more, nothing less.

I think the responsibility of Air Force leaders goes beyond what I have stated. Leaders should cultivate an environment that is empathetic and understanding of diversity. We must promote critical thinking skills to foster acceptance of differing viewpoints and experiences. In the end, Airmen must understand that the ideas, culture, and experiences of *all* Airmen are valid. That does not mean different ideas are always better; neither does it suggest that there will not be disagreement. Rather, we should be open to hearing ideas from varying perspectives and experiences and respect those suggestions that differ from our own. Healthy debate within an organization is critical to achieving ultimate success.

The Importance of Mentoring

Mentors from and for majority and minority members are particularly important in retaining a diverse force. Minority mentors can offer advice based on their experiences while majority mentors can help interpret the unwritten "rules." As a minority officer, I know this is critical. For example, as a second lieutenant I grew a mustache, which at the time was not uncommon for African-American males; however, a mentor of mine constructively pointed out that it was a violation of the unwritten rules. At the time, casual dress to me meant jeans. Again, I was pulled aside and "schooled" on the definition of "officer casual." Mentors can provide networking opportunities and identify specific military support resources for both peers and subordinates.

I have had great mentors during my career. As an enlisted member I had a great chief master sergeant, who encouraged me to complete my college degree and become an officer. As a second lieutenant, I had a great lieutenant colonel boss who taught me to be "eager and enthusiastic." As a first lieutenant and captain, already assigned to the Pentagon, I had numerous mentors who challenged and encouraged me and taught me the ropes of the Building. As a major and lieutenant colonel squadron commander, I had a wing commander who made me want to someday become a wing commander (something at the time that was unheard of for someone with a resources management background).

This constant lineup of mentors has followed me throughout my career. There have always been Air Force members, both Active duty and retired, who wanted to see me do well and get ahead. Interestingly enough, most of my mentors did not look like me or come from a similar background. As a wing commander, my two-star boss literally gave me the keys to the wing and let me go. He was always in the background encouraging and guiding, but I always knew he had my back, and I could sense that he wanted me to succeed—something that I will be forever grateful for. Even as a three-star director on the Joint Staff, the two Chairmen of the Joint Chiefs of Staff I worked for were great mentors and leaders who provided overall guidance, let me go, but watched and guided from the background.

The point here is the term *mentor* is much more than a title; it is, if done right, a relationship. A relationship that can help steer a career in the right direction. A relationship that transcends gender or race. A relationship that can turn a mediocre performer into a great performer. A relationship that provides someone to bounce ideas and challenges off of. A relationship that provides honest and candid feedback. A relationship of trust. And finally, a relationship that teaches the mentee to become a mentor for others.

When I entered the Air Force, there had been no African-American officers promoted to the four-star rank. Additionally, there had been no officers with a primary career-track of budget/resource management promoted past the grade of major general, and none of those were women or people of color. Do not get me wrong—at that point in my career I was not thinking about being a four-star or general officer, period. But I did wonder why those in top leadership positions all looked the same and if there was some barrier or glass ceiling that precluded someone like me from achieving that level of rank and responsibility.

Some may feel there is no point in pursuing diversity. They may point to the fact that the Air Force has performed spectacularly well in every endeavor since its inception—and that is certainly true. However, the world is becoming increasing complex, and the threats to our nation and the associated challenges are asymmetrical. The more diversity of thinking we apply to these challenges, the more opportunities we will have to discover innovative approaches to problem-solving.

Today, our Airmen are the best in the world. Our country relies on them to perform a host of missions from gaining and controlling the skies to launching and operating space satellites, from sustaining two-thirds of the U.S. nuclear arsenal to providing real-time intelligence and surveillance, from conducting humanitarian missions to, when called upon, putting bombs on target. The Air Force should seek to represent the demographics of the society it defends, but we should also embrace and seek a diverse military because it produces stronger combat power for the Nation. We can better accomplish our mission with a more diverse fighting force because diversity makes us a more flexible and innovative force. U.S. Supreme Court Justice Sandra Day O'Connor wrote that "effective participation by members of all racial and ethnic groups in the civic life of our nation is essential if the dream of one nation, indivisible, is to be realized." Likewise, the strength and vision of our Air Force are underpinned by embracing and achieving diversity. JFQ

Pentagon Press Secretary Rear Admiral John Kirby answers questions for media during weekly press conference, October 2014 (DOD/Glenn Fawcett)

Revisioning Strategic Communication Through Rhetoric and Discourse Analysis

By William M. Marcellino

Strategic communication is an important but contested issue, visible in continuing criticisms over the last 5 years. One critique is that the U.S. Department of Defense (DOD) definition of the term *strategic communication* is vague and idiosyncratic in relation to the definitions of other agencies. In turn, this argument runs, the lack of conceptual clarity and of shared, precise terminology hurts the implementation and further development of strategic communication.[1] Additional concerns have been raised about the lack of both domestic interagency and foreign partner coordination and cooperation and the absence of credible expertise in strategic communication.[2] Still, criticisms point to high-visibility failures in strategic communication—for example, the 2001 "Shared Values" campaign and the 2012 U.S. Presidential response to the "Innocence of Muslims" video—as evidence of both strategic communication conceptual flaws and implementation failures.[3]

I propose here that strategic communication can be made more conceptually robust and draw on a more powerful and useful suite of tools and methods by borrowing from two language-focused

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disciplines: rhetoric and discourse analysis. Rhetoric offers an explanatory framework for how and why communication fails or succeeds, as well as practical domain knowledge for how to design and effect sound communication strategies, while discourse analysis is a set of approaches and methods to analyzing real-world language use (*discourse*). Rhetoric, a humanities discipline centered on argumentation and persuasion, has had practical value and been effective since Aristotle's time, but it also has an empirical wing developed over the last 60 years. Discourse analysis is a relatively recent offshoot from sociolinguistics, which brings systematic, empirical analysis to language at the micro level and features a wide range of qualitative and quantitative methods.

This issue of which disciplines, and thus which conceptual models, to draw from has high stakes because they imply different practical choices and methods. As a simple example, ask yourself: if you had to convince the authorities that you were not at place X at Υ time, and if you had to convince them you were sincere, how would you do it? From an empirical perspective in discourse analysis, the answer would depend on the discourse conventions of the authorities. If American English speakers were asking you, then brevity, concision, and coming straight to the point might be convincing. However, if Arabic speakers were your audience, repeatedly proclaiming your innocence might be the right strategy. Most importantly in this example, those strategies are *opposed*—strategies suited for one discourse and culture would likely fail for the other.

Below are two illustrative case studies that show both the conceptual power of rhetoric and discourse analysis and also the nuts-and-bolts methods for analyzing communication and communication failures. For these examples to make the most sense and provide context, I first briefly sketch out how rhetoric and discourse analysis conceptually differ from our current iteration of strategic communication. I then recommend how DOD in general and the combatant commands in particular could effectively and efficiently operationalize insights and methods from these disciplines.

Strategic communication as it currently stands draws primarily from communications theory, public relations, and marketing. In this model, communication is understood to be primarily *monologic* (from a speaker to an audience) and dependent on the ability of the speaker to manipulate or tailor language to properly craft and deliver the right message to persuade or change opinions of the audience. This model also implicitly borrows from linguistic theories popularized by Noam Chomsky that treat language as having a preexisting structure that good speakers use to their advantage. It is from such a model that a ubiquitous phrase such as "controlling the narrative" can have currency and be in circulation.

The above conceptual model is significantly different from much contemporary theory in linguistics and sociolinguistics. In more contemporary theory, communication is *dialogic*: everyone is talking to everyone else, all the time. Even when there is a single speaker at a given moment, such as a formal speech or delivery of a single author paper, all kinds of other talk are implicated (*intertextually*): prior speeches and writing, public talk in the news or private talk in the streets, and expected responses. This means that text and talk are more like conversations than messages. In place of linguistic code to be manipulated, we enter into a conversation with a set of dynamically evolving conventions and expectations that provide current structure.

Instead of thinking about strategic communication as manipulating code (and thus manipulating an audience/outcome), contemporary linguistic science offers us a model of partners in dialogue and argument, working interactively and iteratively to accomplish practical ends. Even when these partners in dialogue have diametrically opposed goals and their interactions are hostile, they are still interactive and social. This model is inherently reflective because to be good at it, we need to have as much understanding of and insight into our own communication practices as we do into those of our enemies and partners. Instead of trying to control the narrative, the goal is to artfully and effectively enter into conversation—a subtle difference that has profound implications for practice.

To illustrate the range of concepts and methods that we could borrow from rhetoric and discourse analysis and then apply to strategic communication, I offer two widely separated and disparate case studies. They include both quantitative and qualitative approaches, using computational and human means, for both international and domestic problems, at the macro and micro scales of analysis.

Linguistic Smuggling in Taliban Information Operations

Taliban strategic communication makes use of the rhetorical device "linguistic smuggling" as a tactic in opposing the International Security Assistance Force (ISAF). Their public statements appear to focus on technical details to which ISAF is most likely to react, disguising what the author(s) consider a more important point to Afghan audiences: defining ISAF as crusaders and invaders. As a result, ISAF's responses likely will not credibly satisfy Afghans.

As an illustrative example, consider how Taliban propaganda and an ISAF press release treat the same green-on-blue incident. Below is a two-part rhetorical analysis of a Taliban press release, coded to show *linguistic smuggling* (hiding a contestable claim) and an *argument stasis* (sticking point of contention):

The casualties of the CRUSADE INVADERS: As "a handful is a specimen of the heap" and the evidence is that the CRUSADE INVADERS have always tried habitually to conceal their casualties. Let us have a look on the incident of the Jalraiz district of Maidan-Wardak province which took place on Monday 11th March. In this incident, an infiltrated Mujahid who was performing his duty among the Arbakis, turned the barrel of his gun to the CRUSADE INVADERS and opened fire. Consequently 22 soldiers were killed and a number of them were severely wounded but the enemy acknowledged only 2 casualties.[4]

Table 1. Argument Stases

Stasis Point	Taliban Propaganda	ISAF Message
Existence: Does it exist/did it happen?		
Definition: If it exists, what kind of thing is it?	ISAF members are crusade invaders, a threat to Islam.	
Value/Quality: Is it worse or better, increasing or decreasing?		ISAF minimizes loss of civilian life. ISAF takes minimal casualties. ISAF maximizes enemies killed.
Cause: What is its origin?		
Action: How should we respond?		

The above sample text shows a Taliban communications tactic: *linguistic smuggling*. Advertisers in the West frequently use this to divert attention away from contestable claims, attempting to get consumers to accept embedded assumptions. Linguistic smuggling works through our expectations for given/new information, by moving new (and therefore contestable) information from its conventional position after established given information. In the sentence "These condos are luxurious," we can think of the condos as the *topic* (what the statement is about) and the claim of luxury as the *comment* (commentary on that topic). But if we say, "These luxury condos are available for only a short time," the claim of *luxury* has been smuggled from the comment into the topic.

In the above Taliban example, the author(s) tactic does not rely on how many ISAF members were killed but rather on defining ISAF as anti-Islamic invaders in the vein of the Crusades. The tactic is to covertly smuggle the claim of ISAF as "crusade invaders" into sentence topics, as if it were given information. However, instead of countering/anticipating such definitions, and perhaps proposing an alternate definition of ISAF as defenders of the legitimate Islamic government of Afghanistan, ISAF offers only the factual details. The ISAF press release for the same incident reads: "Two U.S. forces-Afghanistan service members died in eastern Afghanistan today when an individual wearing an Afghan National Security Forces uniform turned a weapon on U.S. and Afghan forces."[5]

This press release reflects current DOD best practices in strategic communication: clarity, openness, and honesty.[6] This corresponds to American ideas of "straight talk" and implicitly trades on two kinds of *proofs* (modes of persuasion). One is *logos*-dependent—trying to arrange the facts of the case in a way that supports our position. The other is *ethos* (credibility), which has three components: practical wisdom, goodwill, and virtue. Straight talk aims to demonstrate virtue. The whole approach is very American: get the facts straight, and do it with consistent honesty to develop credibility.

While I want to temper my claim here—there is not a body of good empirical data verifying Afghan public discourse and argument conventions—the Taliban tactic is more plausible, on the terms of Afghans, than the U.S.-style ISAF tactic. The facts and figures of any given incident may not be all that important: whether 2 or 20 ISAF members died in the attack may be immaterial. What more likely matters in Afghan discourse—the center of gravity here—is ISAF's definition as either a crusade invader or a legitimate defender of Islam. Taliban authors such as those in the above example clearly understand this principle; ISAF strategic communicators may not.

In this sense, such Taliban propaganda writers and ISAF are talking past each other, at different segments of argument. In rhetorical theory, these segments are *stases*, literally "sticking points" in argument. The five major stases can be used to diagram speakers talking past each other (see table 1).

Neither side disputes the first possible stasis point—the existence and relevance of ISAF. But through linguistic smuggling, the Taliban writers have found covert (and very plausible) ways to argue the second stasis point, which ISAF does not explicitly address. This is critical because stases are progressive—we cannot successfully work on later stases until we have worked through prior ones. Since ISAF misses that the stasis point in play is the definitional stasis, they cannot argue the last one: the action stasis. If ISAF are legitimate defenders of an Islamic Republic, then they should be supported, or at least not opposed. But if they are "crusade invaders," Afghans have a moral obligation to resist.

The stases also have an ethos dimension. The ISAF/American-style response tries to gain credibility through virtue (honesty), which helps build up our ethos. But so does another part of ethos: *eunoia*—goodwill to the audience. "Crusade invaders" do not bear goodwill, and consistency in talk does not change that. Telling people we hope to persuade (or leaving unchallenged the belief) that we are indeed an invading foe, dedicated to a crusade against them, but that we are honest invaders, is a questionable communications strategy.

A Computer-Aided Rhetorical Analysis of U.S. Marine Corps Public Speech

When U.S. Marine Corps general officers speak on the record in public, they have a distinctive linguistic style that communicates their stance: one of moral and knowledge certainty. They perform this style consistently, regardless of how contested an issue is and to whom they speak. This may be a constraint on their ability to speak effectively in civil-military deliberations.

This second case study is a domestic example using corpus analysis software to empirically describe large amounts of textual data. In this case, corpus analysis software is used to quantify *style*: the linguistic micro-choices we make in representing the world. Small but consistent choices in language aggregate to offer the audience a perspective on what is being

talked about. For example, a leader in an organization who uses "I" regularly versus "we," or says "I know" rather than "I think," is offering very different rhetorical experiences to his or her audience. When journalists consistently describe the object of their reporting with phrases such as "tries to," "makes an attempt to," and "appears to be," they are *hedging*—offering small but critical linguistic markers to their audience that they should not trust the surface presentation of the object.

Corpus analysis software designed to count these micro-style choices across a range of categories allows for statistical tests on the results in order to make empirical claims about what is happening in communication, and to make visible trends and differences that an analyst could not see because of human limits to memory and attention.[7] In this sense, corpus analysis software acts like a prosthetic for human communication analysts, and can both empirically support or disprove human qualitative impressions and bring a bird's-eye view to the kind of data we usually use human reading to analyze, but in mass quantities no human could ever address. Through the following domestic communication case, I want to show how an empirically grounded discourse analysis method can help speakers from one group (in this case, senior Marine Corps officers) be more self-aware in their communications with another group (civilians) and thus be more effective.

Figure 1 is a graphical representation of how distinctive Marine Corps public speech is—a style I call *Marinetalk*. This is the speech of Marine senior officers speaking in 2010 referenced against general contemporary English, which shows a tight, distinctive cluster.[8]

The terms *Consistent* and *Inconsistent* on the Y and X axes refer to how consistently present, and thus characteristic, a given stylistic feature is relative to general English. The graph uses a nonparametric statistical test that allows two data sets to be compared for the regularity of distribution of features.[9] Thus, the farther up and to the left a data point is, the more strongly the text aligns with Marinetalk, while data points lower and to the right are the least like Marine public speech.

Figure. Marinetalk vs. FROWN English Corpus

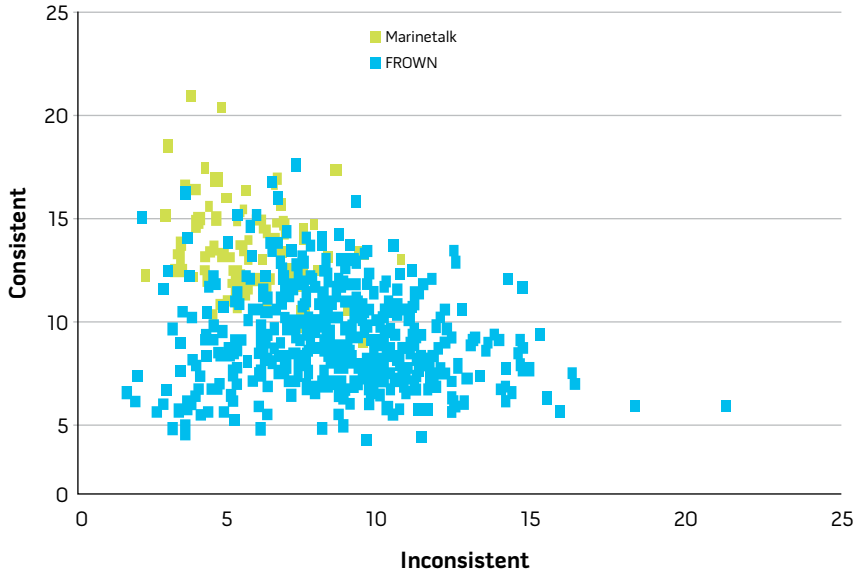

Table 2 illustrates some of the relevant characteristic style features of Marinetalk when compared to general English, with example word strings. Essentially, Marinetalk sounds like a highly confident/certain person telling others about a shared future, invoking positive reasons why they should buy into it. This will likely not surprise anyone who has been a Marine or has worked with the Service. What does seem surprising, and needs explanation, is the consistency of this way of talking.

The rhetorical profile detailed above makes sense given the mission and structure of the Marine Corps. The institution needs to motivate large groups of people to coordinate their actions to arrive at desired endstates/places. Marinetalk reflects institutional needs to speak with certainty (which includes subjective register speech from personal authority and confidence, and directive insistence), argue constructively for future goals, index positive values both as means and end, and promote cohesion with positive/inclusive values.

The consistent style Marine general officers use indexes their attitudinal stances toward their audience and topic, how sure they are, and so forth. This is something that emerges cumulatively in talk, not through any specific, discrete element; their style offers a particular rhetorical experience to others through linguistic choices as they speak. In this case, Marines use lexical and grammatical choices to sound certain, speak from experience, and create a "we" in a shared future.[10] The certainty that marks Marinetalk puts Marines on a superior footing as duty experts on military subjects. This works well most of the time—in uncontested issues, the Marine senior officer speech analyzed in this study received collegial questioning, thanks, and praise.

But in contested issues such as ending "Don't Ask/Don't Tell" (DADT), Marine speakers received a much more challenging reception, including cross-examination, critiques, and counters to their claims. Given the contested subject and the opposition of audience members, Marinetalk seems to function as a constraint on Marines' testimony before Congress. How Marines spoke is not the only issue, of course. The content of the argument and political positions of other participants are relevant as well. However, this only highlights the choice not to vary speech by situation and context—talking to a civilian audience as if they were a Marine audience on important and contentious issues such as ending DADT does not make sense.

Just as in the ISAF example, Marine senior officers tend to repeat the most

Table 2. Sample Lexical Items/Strings for Marinetalk Speech Features

Language Category	Relatively Consistent	Relatively Inconsistent
Subjective Register	First person: "my," "I" Self-disclosure: "I thought" Autobiography: "when I" Intensity: "every single" Immediacy: "right now" Confident: "certainly"	Private thinking: "realize," "believe that" Subjective time: "their time" Subjective perception: "personal," "view with" Uncertain: "guess," "about [#]"
Emotion		Positivity: "the best," "comfortable with" Negative emotion: "the problem with," "stress," "suicide"
Institutional Register	Commonplace authority: "coalition," "forces" Responsibilities: "obligations" Positive values: "adequate capability," "gains"	Innovation: "breakthrough in" Negative values: "violence," "not be able"
Future	Projecting ahead: "in training," "in readiness" Predicting the future: "will," "will be"	
Past		Projecting back: "we've been," "year ago"
Personal Relations	Inclusiveness: "our," "partner with"	
Reasoning	Reason backward: "because" Resistance: "defend," "impose"	Reason forward: "So we," "so that" Support: "in support of" Concessive: "although"
Directives	Insist: "the need for"	Imperatives: "Do not," "remember"
Character		Personal pronouns: "she," "he"

fundamental structural patterns of their discourse. These Marines are smart people and are no doubt aware of many surface features of language they need to vary by audience—not using acronyms or insider technical terms is an obvious one. Borrowing from discourse analysis and methods such as corpus analysis and computer-aided rhetorical analysis could add high-precision visibility over their stylistic choices, strongly leveraging their ability to communicate effectively with civilian audiences.

Implications and Recommendations

Borrowing from these language-focused disciplines has important implications at multiple levels for both policymakers and commanders. Some possible directions include the following.

Incorporate Discursive Strategies to Language Translations. Translation into another language is not enough by itself; it is very possible to speak another language while repeating our own culture's discursive strategies. The sincerity and trustworthiness issue mentioned earlier is a good example. In Arabic discourse, repetition is an incredibly important proof of sincerity and a principle linguistic strategy in argument. In Arabic discourse, repetition operates at the level of both content and structure. To be persuasive in argument, Arabic speakers might repeat their point over and over again (content), but they might also do so rhythmically, repeating parallel sentences or phrasing (structure). This conflicts with Western, particularly American, ideas of sincerity, which rely in part on brevity and the construction of a trustworthy ethos of virtue.

Our enemies understand this; consider the English and Arabic suicide message videos of Hammam Khalid Al-Balawi, responsible for the 2009 bombing of Forward Operating Base Chapman in Afghanistan. Both have roughly the same content, but their discursive strategies differ greatly. The Arabic version relies heavily on rhythm and repetition, an appropriate argument strategy for an Arabic speaking audience. By contrast, in the English version the author(s) establish the moral virtue of the bomber through ethos proofs in a prelude (or *proemion*), a standard feature of Western rhetoric. The Arabic version also features plural pronouns exclusively, while the English version includes sections with singular pronouns, again reflecting microlevel understanding of Arabic and English discourse conventions and argument strategies. The author(s) of those messages knew not only to translate into the right languages but also to adopt matching discursive strategies.

Turn the Culture and Language Lens on Ourselves. Critical analysis of how others in the world speak and live is essential to U.S. operations overseas, from the tactical to the strategic levels of war. The Services recognize this and have their own iterations of culturally/linguistically grounded education and training (for example, the Army Culture and Foreign Language Management Office and Marine Corps Center for Advanced Operational Culture Learning). This is good; however, we need to understand our own culture and the cultural aspects of our own language just as much as we need to understand the language and culture of our partners and enemies. Cultivating a self-aware and reflective posture in which we habitually interrogate our own discursive and rhetorical practices would put us in position to use such insights skillfully when we talk to the world.

Draw and Adapt from Language-Focused Disciplines. There is an existing body of theory, research, and methods

from discourse analysis and rhetorical studies that DOD can leverage. To adapt this mature field to a novel application, the Services and DOD will need to operationalize a scholarly body of study. This is something the U.S. defense establishment has experience doing, and it is well positioned to develop relevant partnerships with academia. This could follow three lines of effort.

Adapt concepts and methods. Strategic communication can benefit from empirically derived concepts for thinking through roles in communication, issues of identity and relatedness in communication, problems in argument, and so on. The argument stases analysis in the Taliban messaging case study is a good example of a conceptual starting place for thinking through ends and means in persuasion. There is also a significant body of technical methods available to apply. These cover the macro and micro ends of communication and an incredibly wide range of analytical entry points to communication: dimensions of explicitness and implication in discourse, ideological aspects of discourse, clause-level resources for values and appraisals, and so on.

Adapt existing off-the-shelf technology. The corpus analysis of Marine speech is a good example of a powerful and precise method for leveraging human analytical attention in communication and has great potential for atmospheric monitoring—analyzing thousands of responses across traditional and social media to U.S. communications or gaining insight into communication norms and practices in other language communities could be invaluable. The existence of reliable, robust technology for doing this in English means that adapting to target languages is plausible and could be done cost effectively.

Employ professionals in language-focused disciplines. In the last 10 years of warfare, the U.S. military learned to draw on the expertise of professionals in culture-focused disciplines such as anthropology. While there is criticism of specifics of the Human Terrain System, the program springs from recognition that population-centric operations require expertise in cultural knowledge. Language is just as fundamental to human behavior as culture is, and tapping the human capital of professionals in this area can be a powerful tool for informing strategic communication.

Make Combatant Commands the Point of Insertion. As the entities best situated regionally to communicate in audience-appropriate ways and because of their functional needs, combatant commands are the logical point of insertion for revisioned strategic communication. We can envision empirical data collection and both quantitative and qualitative analyses to establish baselines and variances for regional responses and interpretations of combatant command messaging. This in turn could provide invaluable data-driven and timely feedback and insight for improved communication that is effective for regional and local audiences.

A More Effective, Empirically Grounded Strategic Communication

We have not abandoned strategic communication because we have an intuitive understanding that it matters. But we have not been satisfied with it either, casting about for ways to fix strategic communication (or its application). This article is a starting point for thinking through an improved understanding of strategic communication and better practice. I have tried to make a case for language disciplines such as discourse analysis and rhetoric as mature bodies of knowledge with powerful explanatory theory behind them, a wealth of expert knowledge built up over approximately a century of rigorous empirical fieldwork in natural settings, and highly precise and reliable methods for analysis and production of communication. By moving to an evidence-based understanding of how discourse and communications actually work, we can engage with and communicate more effectively with the rest of the world. JFQ

Notes

[1] Dennis M. Murphy, "The Trouble with Strategic Communication(s)," Army War College Center for Strategic Leadership Issue Paper 2-08, Carlisle Barracks, PA, 2008; Christopher Paul, "'Strategic Communication' Is Vague: Say What You Mean," *Joint Force Quarterly* 56 (1st Quarter 2010), 10; Patrik Steiger, "Virtuous Influence: An Imperative to Solve U.S. Strategic Communication Quandary," Army War College Center for Strategic Leadership, Carlisle Barracks, PA, March 24, 2011.

[2] James G. Stavridis, "Strategic Communication and National Security," *Joint Force Quarterly* 46 (3rd Quarter 2007), 4.

[3] Steve Tatham, *U.S. Governmental Information Operations and Strategic Communications: A Discredited Tool or User Failure? Implications for Future Conflict* (Carlisle Barracks, PA: U.S. Army War College Press, 2013).

[4] "Afghanistan in the Month of March 2013," Ansar Al-Mujahideen, April 19, 2013, accessed at <www.ansar1.info/showthread.php?t=45578&goto=newpost>.

[5] "U.S. Forces–Afghanistan Casualty Report," March 11, 2013, available at <www.isaf.nato.int/article/isaf-releases/u.s.-forces-afghanistan-casualties.html>.

[6] Stavridis, 4.

[7] The software used in this analysis has a highly granular taxonomy of language that includes 15 categories at the highest level down to 119 at the finest level of granularity. Some examples of top-level categories include *emotion*, *personal relationships*, *reasoning*, and *future/past talk*.

[8] Data included 34 public on-the-record speeches from 13 senior Marine officers in 2010, primarily congressional testimony, but also press question and answer sessions, town hall meetings, and ceremonial speeches, reflecting representative considerations such as population, size, and generalizability. This also meant a judgment that 2010 was a representative year in that civil-military talk that year covered everything from ordinary, course of business concerns (for example, enlisted professional education) to contentious, unusual concerns (such as ending Don't Ask, Don't Tell).

[9] Boot-strap Kolmogorov-Smirnov test, a nonparametric test used to see if and how the distribution of a feature in the Marinetalk corpus varies from the comparison FROWN corpus (a standard national corpus of general American English, spoken and written).

[10] For a detailed analysis, see William M. Marcellino, "Talk Like a Marine: USMC Linguistic Acculturation and Civil-Military Argument," *Discourse Studies* 16, no. 3 (June 2014), 385–405.

Master Sergeant Charlie Sanders (left) and Captain Lashon Bush work on Mission Event Synchronization List in Joint Cyber Control Center during Operation *Deuce Lightning*, Grafenwoehr, Germany, February 2011 (U.S. Army/Lawrence Torres III)

A Theater-Level Perspective on Cyber

By J. Marcus Hicks

Gentlemen, the officer who doesn't know his communications and supply as well as his tactics is totally useless.

—General George S. Patton

Most U.S. military cyber professionals will tell you that "defense is the main effort" and that providing secure and reliable communication is job one. In practice, however, most cyber discussions focus on sophisticated computer hackers conducting exploitation (espionage) or attack (sabotage) operations. The reasons for this seeming contradiction include cyber espionage intrusions, industrial-scale intellectual property theft, and denial-of-service attacks that cost millions of dollars and naturally capture headlines and the imagination. Likewise, the potential for cyber attacks to disrupt infrastructure with kinetic-like consequences provides fodder for books and articles that bridge reality

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and science fiction, empowering armchair theorists to contemplate a new and different type of war and warrior.

Still, the military's main effort must be to provide, operate, and defend the ability to command and control (C2) forces. If we fail at this task, the commander's mission will likewise fail. Effective command, control, communications, and computer systems define the modern American way of war. This requires highly technical systems, consuming large amounts of bandwidth to support the intelligence, surveillance, and reconnaissance mission requirements that feed the C2 system. Our high-tech advantage enables and arguably defines much of the conventional overmatch currently enjoyed by the U.S. military and its allies. Our operational concepts assume levels of situational awareness and the ability to control forces with a level of precision unimagined a generation ago. To maintain that advantage, I too agree that defense is the main effort and that we must keep it the main effort.

In this article, I offer a theater-level perspective of cyber and hope to provide a view of what is in, what is out, how we are doing, where the thorny issues lie, and finally, some thoughts on a way ahead. This is not a new discussion, and I do not have all the answers, but I do have a unique perspective. From 2011 to 2013, I served as the U.S. Pacific Command (USPACOM) J6 as well as the director of the USPACOM Joint Cyber Center (JCC). My responsibilities included the cyber portfolio for over half the world, ranging from traditional J6 command, control, communications, and computer systems to the emergent mission of offensive cyber operations. As a career Air Force Special Operations pilot, I came to the cyber discussion with few preconceived notions or paradigms to shatter.

Managing the J6 portfolio, I was impressed with how strongly planning, architecture, and engineering efforts (provisioning) inform resilience and defensibility (operate and defend) and even offensive considerations (exploitation and attack). The reverse is also true. The more I learned about cyber, the better communicator I became. If we add to this portfolio the need to coordinate with allies, partners, and emerging partners, then cyber looks like an increasingly operational and inherently coalition activity. A few of my observations may be controversial, but most will be common knowledge to communicators and cyber professionals. My target audience is the operational community because I believe that command, control, communications, and cyber are a commander's business.

First, I have developed an expansive view of cyber, seeing no meaningful difference between information technology (IT) and cyber. Virtually everything is in—from the core of traditional communications and signals intelligence disciplines to command and control programs of record. Radio frequency (RF) spectrum management, telephony, crypto-management, security policy for information-sharing, and intelligence support to signals intelligence are all cyber or cyber-related activities. The current Department of Defense definition of *cyberspace* is "a global domain within the information environment consisting of the interdependent networks of information technology infrastructures and resident data, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers."[1] Consistent with this definition, even administrative systems used to process sensitive information, support decisionmaking, or transmit decisions can be part of the C2 process even though they are not a recognized program of record. Cyber capabilities are essentially a high-tech, high-speed successor to written communications, maps, and calculations, providing intelligence and C2 capability. Like dispatches carried by riders on horseback a thousand years ago or conveyed by the telegraph a hundred years ago, cyber is subject to the vulnerabilities of intercept, exploitation, and disruption. The Great Game has entered the computer age.

Thus, I find it counterproductive to seek cuts in IT while investing in cyber capability. I do support seeking efficiencies in IT, cyber, or any other endeavor, but not at the expense of operational capability. Cutting manpower to operate military networks consistent with lean corporate models may work in peacetime, but it may not leave sufficient personnel expertise in the right places to operate and defend networks in a contested environment.

I generally agree with the conventional wisdom that separates traditional information operations and electronic warfare (EW) from the cyber enterprise. Cyber may enable information operations, but its discipline exists apart from the technology-centric cyber realm. Electronic warfare, however, is a more difficult question because it straddles the cyber fence. One could argue that anything involving RF spectrum management or controlled by computer processes with any external interface should be considered part of the cyber domain. Accordingly, EW could be part of the cyber enterprise, and I suspect it will migrate in that direction.

Second, cyber is an increasingly operational activity. The American way of war heavily relies on cyber capability. Furthermore, given the increasingly contested cyberspace domain, it follows that cyber capability must represent a substantial focus for the military. The military recognized this initially in standing up the Joint Task Force Global Network Operations and, more recently, U.S. Cyber Command (USCYBERCOM). Still, much of the cyber overmatch we currently enjoy developed from long periods of operations in Iraq and Afghanistan, against technologically unsophisticated adversaries, which provided a virtual sanctuary for our own capabilities. As we withdraw from Afghanistan, worry about Iran, and rebalance toward the Pacific, we have a renewed and increased emphasis on developing and maintaining our ability to operate in contested and denied environments against technologically sophisticated adversaries. Recognizing that potential adversaries pose threats to our intelligence, logistics, and C2 functions, commanders and the operational community are realizing that we must treat cyber more like an operational activity and less like an administrative support function. This makes

sense since the C2 system is effectively the commander's primary weapons system. Thus, the capabilities provided by cyber are operational imperatives and truly a commander's business.

Third, cyber is inherently a coalition activity. Whether the mission is humanitarian assistance and disaster relief or combat operations, the United States rarely goes it alone. We maintain treaty alliances across the globe, continually seek to improve relations with existing partner nations, and expand partnerships with others. We aim to improve collective security and reduce the possibility of miscalculation where tensions exist by leveraging coalitions and their capabilities. These activities require varying degrees of information-sharing with substantial policy and technical implications.

Like other geographic combatant commands, USPACOM engages with more than 20 allied, partner, and emerging partner states across the Pacific to evolve and improve communications interoperability through activities such as RF spectrum management, security policy agreements, tactical data-link coordination, and crypto-management. These activities are as far from hacking as possible, but they provide the foundational elements of cyber and are critical to the main effort.

Foundational cyber activities directly address the combatant commander's priorities of strengthening relationships with allies and partners and building partnership capacity. The cyber security instruction we offer during bilateral and multilateral engagements consists primarily of best practices from the disciplines of information assurance and computer network defense. These offerings are increasingly popular and have served not only as catalysts for relationship-building but also as necessary preconditions for the development of secure, trusted, and reliable information-sharing capabilities. If we hope to operate successfully with allies and coalition partners, we must invest in relationships and cyber capabilities with integral mission partner capability.

Fourth, cyberspace has a global and regional component. Like other traditional military activities, cyber has a global and regional element. We recognize that the domain is too large and activities too complex to be centrally managed by a single operations center. At the same time, however, the physical characteristics of the global information grid (GIG) do not lend themselves to purely regional control. Thus, we need to strike the right balance between global and regional equities. From my perspective, we should err on the side of giving geographic combatant commanders more capability and authority to plan to create cyber effects as well as command and control their command and control, or as Admiral Robert F. Willard often stated, their C2 of C2.

Fifth, because cyber has become so critical to the American way of war, I see real value in having a single organization within a combatant command manage the entire cyber portfolio. In particular, I value the current Joint Cyber Center (JCC) construct that combines all cyber activities from across the command staff. In the legacy construct, the J6 manages the "provide, operate, and defend" portfolio; the J2 works exploitation through intelligence channels; and the J39 supervises the cyber attack mission under the information operations rubric. Some other variant could work, but my experience suggests that operationally minded individuals viewing challenges through a cyber lens would develop more holistic and innovative solutions than could be achieved by individuals from organizations that support cyber as a collateral duty. Simply put, because cyber is its primary focus and singular mission, the JCC can focus more energy into this critical and dynamic domain. In other constructs, cyber could be rendered a secondary focus in organizations with competing domain demands, such as the J2 or J3.

The objective of a JCC, with the entire cyber portfolio, is to develop an operationally focused tool for the commander in partnership with the rest of the J-staff. Advantages include inherent efficiencies of remaining within an existing staff organization for administrative overhead, which also allows for dual-hatting of certain low-density JCC and J6 personnel. More importantly, the JCC integrates directly into the theater commander's decision cycle through battle rhythm events, thus retaining cyber decisions at the theater commander level and avoiding bifurcating C2 by outsourcing critical C2 functions to a separate component. Thus, the USPACOM Joint Cyber Center operates with some characteristics of a separate component, but one more efficient and closer to the theater commander. Many constructs could work, and I do not favor a one-size-fits-all approach or a centrally directed solution. We will need to experiment and evolve as conditions dictate. Availability of resources, more than any other condition, will suggest the best organizational construct. Combatant commands with fewer cyber resources will organize differently than those with more assigned cyber forces. Similarly, subunified commands and component commands may organize differently from their combatant command as circumstances dictate.

How Are We Doing?

From the "provide, operate, and defend" side, cyber has rapidly evolved from Service-provided administrative IT systems with some connection to dedicated C2 systems to become critical warfighting systems for the joint force. Unsurprisingly, the pace of change has left suboptimal legacy infrastructure in place that renders it more difficult to operate and defend. Concurrently, cost savings measures have centralized operations and stripped system administrators—read "cyber operators"—to levels more in line with corporate IT structures than operational C2 systems. Similarly, outsourced contracts maintain Service-level agreements that are optimized more for routine, peacetime operations than for exercises or contingencies. Taken together, it is easy to see how over-centralization of operations centers and minimal manning could lead to capacity overload with anything other than a routine disruption, which might be an acceptable level of risk if the networks were purely administrative. Since, however, we have built a concept of operations that relies heavily

Secretary Hagel tells troops cyber may be biggest threat to U.S. security (DOD/Erin A. Kirk-Cuomo)

on our overmatch in C2 capabilities, those capabilities must be operated and defended as a weapons system.

Operationally responsive networks do not rely heavily on compliance-based security measures. Centrally mandated security policies enforced across the enterprise through a rigorous inspection regime are necessary and show progress toward treating cyber as an operational domain. However, the ability to dynamically adjust security policies, to sense—rather than inspect for—compliance, and to isolate compromised portions of the GIG before a risk to one becomes a risk to all is critical to ensuring secure and resilient operational capability. My experience through exercises and contingencies unambiguously suggests that we must develop a concept of operations, capability, and capacity to defend, recover, and reconstitute our cyber capability in the face of a contested environment.

By way of analogy, every Air Force aircraft I have flown comes with technical orders (TOs) on maintaining and operating them. For example, the TO AC-130U-1, known as the "dash one," is a massive volume of procedures for operating the AC-130 gunship. Like in all dash ones, chapter three is dedicated to abnormal and emergency procedures and includes certain emergency procedures (EPs) deemed sufficiently critical to commit to memory, verbatim. These "boldface EPs" cover time-sensitive, life-threatening eventualities, such as engine fires and loss of cabin pressure. Before flying an aircraft, fully qualified pilots must first study normal and emergency procedures, demonstrate unerring understanding and recall of boldface procedures, and train for their practical implementation in high-fidelity simulators. Much routine training is dedicated to operating with degraded systems and addressing emergencies. This is pretty standard for operational weapons systems. Similar analogs exist on ships, in missile silos, and more.

Unfortunately, this analog breaks down for network operations. Technical specifications normally exist and system administrators are often highly skilled, but networks are not treated as weapons systems. The vendor providing a network does not provide a dash one or even anticipated failure modes that would normally constitute "chapter three." Thus, networks that are not treated as weapons systems lack boldface EPs and deliberate processes for training to operate when under attack or degraded due to a natural disaster. Those networks are not easily severable to isolate damage or infected enclaves. Nor are they capable of providing enhanced security for the most critical systems or information. At USPACOM, we have demonstrated time and again

Admiral Michael Rogers addresses audience and workforces of U.S. Cyber Command, National Security Agency, and Central Security Service at his assumption of command ceremony, April 2014 (National Security Agency)

that the implementation of responsive network security measures is ponderous and inexact due to complex C2 arrangements, insufficient manning at major operations centers, a dearth of network instrumentation, or an inability to take action at a regional location due to excessive centralization.

We have built in these foundational problems by making our C2 system reliant on economically efficient networks originally deployed by the Services as administrative tools. Additionally, we have centralized network operations and reduced manning to such an extent that only routine technical problems are easily manageable. Service-level agreements with contractors are not responsive to operational requirements in exercises and contingencies. Centralization by definition reduces regional capability. Excessive centralization leaves combatant commanders little or no capability to manage risk across the areas and operations for which they are responsible.

A Way Ahead

Although the current state of cyber may seem less than ideal, there is reason for optimism. Much has been done already to set conditions for success in the cyber domain. Additional resourcing and the standup of USCYBERCOM and combatant command JCCs are the most obvious examples. Ongoing discussions about workforce development and the Joint Information Environment (JIE) give further reason for hope. Still, as we set the framework for future cyber capabilities, getting it right is critical, and the time to act is now.

Developing an operationally minded cyber workforce is a critical requirement. Born of the communications and intelligence disciplines, the cyber community has leveraged career operators to provide an operational focus for traditional supporting functions. Reminiscent of the early days of carrier aviation, cross-decking traditional operators to provide a cadre of senior officers to advance a new concept is a sound and proven technique. Creating operationally minded cyber operators from the beginning of their careers will be necessary for the long term and constitutes the real test.

As the Services struggle with this effort, aviation provides another useful analog. Like aviation, cyber requires many disciplines and training standards across a multitude of mission areas to function properly. Therefore, just as the aviation community is made up of pilots, maintainers, air traffic controllers, weather specialists, airfield managers, engineers, and more, we should embrace the notion that many different career fields will make up the cyber enterprise. Network operations personnel should

have different training and follow a different path than those trained in exploitation or attack missions. Like pilots of different aircraft performing different missions, cyber operators will have different specialties at the tactical level. Most officers, however, should broaden across other specialties as they progress through their careers in preparation for leadership of larger, more diverse organizations.

Said differently, we do not have to recruit and train every cyber professional to the same standard. We can recruit a variety of talents and use them appropriately without trying to train everyone as a hacker. The challenge lies in ensuring that all career paths remain competitive for leadership opportunities at all levels, lest we create a class system with all its negative connotations.

Like pilots, all cyber operators will need a basic knowledge and skill set. Also, they will need advanced knowledge and skill in their particular tracks. Here, the track seems to split between defense and offense, between those with the "provide, operate, and defend" mission and those on-net operators with the "exploit and attack" mission. I recommend that we send quality individuals to both tracks because I am not convinced one is inherently more difficult than the other. This is particularly true if we operate and defend the networks as a weapons system, especially in a contested environment. Additionally, since defense must remain the main effort, we cannot let it become viewed as a second-class activity.

Along with personnel, we need to field the best equipment we can afford to avoid taking a proverbial cyber knife to a cyber gunfight. Fortunately, a solution is in our grasp as long as we focus on operational capability and not IT efficiencies.

Developing an operationally responsive infrastructure is a critical requirement. Deployment of the JIE can solve most of our cyber material shortfalls so long as the focus remains on ensuring that the next generation of military networks provides defensible warfighting capability to commanders. The effort originated as "IT Efficiencies" and morphed into "IT Effectiveness" before becoming the JIE, so there will always be a healthy emphasis on cost savings. The JIE aim, however, is to improve information capability and network defensibility through network normalization, a single security architecture, and reduced infrastructure where consolidation and other best practices make sense.

Given the criticality of cyber to coalition effectiveness and interoperability, we require the inclusion of coalition capability into the next JIE stage. Leveraging commercial solutions for classified networks, we envision rapidly establishing a specific network enclave for a particular exercise or event that coalition partners can join and use to share classified information releasable to the coalition members. When no longer required, the network enclave could be easily disestablished. This kind of flexibility could prove valuable across the operational spectrum from small-scale missions to large coalition operations.

The same technology, currently undergoing advanced testing, would also provide increased cyber situational awareness and defensibility. The design specifically allows for protection of certain enclaves or communities of interest. Thus, critical data will be more resilient and secure than the overall network, further improving cyber security through a defense-in-depth approach.

Vast distances and the maritime nature of the Pacific theater dictate a data center consolidation plan consistent with a potentially disconnected, intermittently connected, low-bandwidth environment. In anticipation of natural disasters or contingencies, redundant and dispersed data centers across the area of responsibility are crucial.

Finally, the operating concept for the JIE must provide geographic combatant commanders sufficient capability and authority to manage risk to their command and control while a global enterprise operations center manages risk to the global information grid. Consistent with other traditional military activities, disputes between geographic and global priorities would be arbitrated by the Secretary of Defense as the first common boss in the chain of command.

The exquisite command and control capability cyber provides represents a foundational aspect of current U.S. military capability. Since cyber and IT are indivisible, we must take a holistic approach to cyber. As the domain becomes increasingly contested, we need to operationalize cyber, and we fail to do so at our own peril. To do so, traditional operators should become more aware of and well versed in cyber, and cyber operators must become more operationally minded. We have an opportunity to develop the next generation of operationally minded cyber warriors who will underwrite the American way of war and create effects currently unobtainable. Necessarily, our next-generation warfighting network must be a weapons system for the next-generation war, not an administrative network for the interwar peace. Ultimately, cyber should be to the 21st-century military professional what logistics was to their 19th- and 20th-century counterparts: the discourse of professionals and the business of commanders. JFQ

Note

[1] Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: The Joint Staff, July 16, 2013).

MH-60S Seahawk helicopter assigned to "Swamp Foxes" of Maritime Helicopter Combat Squadron 74 departs USS *Mason* during U.S.-China cross-deck landing exercise with People's Liberation Army Navy destroyer *Harbin* (U.S. Navy/Rob Aylward)

Refocusing the U.S. Strategic Security Perspective

By Linnea Y. Duvall and Evan O. Renfro

Since the early days of Cold War rivalry between the United States and Soviet Union, policymakers have recognized that low-intensity conflict and limited wars often occur in spite of *deterrence*—that is, using the threat of military force or coercion to change an adversary's behavior. Because of this shortcoming and risk of escalation, the United States has applied deterrence haphazardly in its relationship with China. Yet U.S. policymakers have failed to identify an alternative approach for chronic disputes that are not readily shaped by military posturing. This deficiency is overlooked at the expense of muddling through commonplace confrontations with China over fishing rights, maritime borders, and cyberspace rather than establishing consistent mechanisms to reduce tension and prevent escalation. Some analysts, such as Richard K. Betts, see only two stark choices to address this dilemma: "accept China's full claims as a superpower when it becomes one or draw clear redlines before a crisis comes."[1] However, we do not need to limit our options to deterrence or acceptance. Rather, we should complement deterrence with a more flexible, strategic framework focused on conflict management.

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While deterrence has been an essential component of its military strategy, the United States requires the addition of a conflict management framework to address China's violations of international norms that underpin regional stability. China has demonstrated its assertiveness by taking control of the Scarborough Reef in the South China Sea, entering Japan's airspace over the Senkaku Islands (called the Diaoyu Islands by China), and infiltrating U.S. military and public cyber networks. This unlawful behavior is likely to continue in the absence of a coercive response from the United States or its allies. But the United States, and to a lesser extent Japan, have little appetite to escalate such nonviolent disputes into open military or diplomatic crises. An effective strategic approach must therefore mitigate the destabilizing impacts of China's behavior without militarizing the disputes.

The objective of conflict management is to minimize the negative political, economic, and military impacts of disputes and avoid escalation. *Conflict* is here defined as a dispute with the potential to draw nations into war. A conflict often escalates into a crisis, a critical decision point at which military action is imminent or limited to less than the 1,000 deaths that normally define a war. In the case of the U.S.-China relationship, managing chronic conflict requires a greater emphasis on local information and awareness, law enforcement, and coordinated political-military responses to crises. This approach is similar to preventative diplomacy, but with the key distinction that conflict management implies a resolution is not possible either under current conditions or in any reasonable amount of time. Mediation and negotiation over specific claims are therefore less central to conflict management than conflict resolution. This is not to say that resolution is not desirable: by reducing tension in the near term, conflict management leaves open the option for a more permanent solution in the future. While deterrence will continue to underpin the prevention of war, dealing with China's nonmilitary assertiveness requires a coherent conflict management framework to strengthen situational awareness, bilateral communication, and law enforcement while mitigating the risk of escalation and miscalculation.

How to Start Worrying and Loathe the Bomb

U.S. policymakers recognized the limitations of deterrence early in the Cold War. Even as Washington and Moscow assembled massive stockpiles of nuclear and conventional weapons that prohibitively raised the cost of war, they also competed for influence in proxy conflicts across the globe. Deterrence theorist B.H. Liddell Hart warned in 1954 that the threat of nuclear war reduced the likelihood for direct aggression but simultaneously increased the possibility of limited, peripheral conflict. As fictional character Dr. Strangelove commented, the reason deterrence is not practical in such contexts "must be all too obvious" as it fails when threats are not "completely credible and convincing."

To mitigate the limitations of strategic deterrence during the Cold War, the United States developed flexible response options that prepared for military action across the spectrum of warfare. This approach complemented and was used in conjunction with strategic deterrence. It expanded the military options for limited war and therefore made deterrence more credible at the lower end of the conflict spectrum. Yet while the flexible response doctrine enabled more nuanced military action, it was still at its core a means to better deter the Soviet Union. It did not require policymakers to develop a more sophisticated political and social understanding of the conflicts they faced.

The Gulf of Tonkin incident illustrates the risk involved with this strategic framework. When North Vietnamese vessels fired on U.S. Navy ships in 1964, President Lyndon Johnson favored an increase in the American presence in South Vietnam to deter Soviet expansionism. In this mindset, the U.S. security architecture was limited in the courses of action it allowed itself: to respond with nuclear weapons to deter Russia, through the proxy of North Vietnam, or through a limited war. Yet the incident in the Gulf of Tonkin was a sideshow to the real conflict occurring within Vietnam between an illegitimate government and an ideological insurgency. While a deterrence strategy kept the United States focused on adversaries outside Vietnam, a conflict management approach would have emphasized preventing the spread of the discontent within Vietnam that was undermining the country's stability. Such a view would have prioritized minimizing the negative fallout of Tonkin by focusing on the political and domestic context beforehand and allowing for a proportionate political and military response afterward.

This is not to say that Cold War leaders failed to consider conflict management. In crises that avoided hostile action, fear of escalation helped the United States and Soviet Union develop bilateral conflict management mechanisms, albeit in an ad hoc manner. A breakthrough in crisis management followed the Cuban Missile Crisis in 1962 when Washington and Moscow established a "red phone" hotline for leadership consultations. The two superpowers also signed an agreement for handling incidents at sea in 1972. Yet conflict management never became a strategic framework on par with deterrence or embedded as part of a multifaceted spectrum of response options.

Moving Up, Moving On

Today, the United States addresses disputes with China with a mindset stuck in the Cold War. Washington continues to rely on deterrence and flexible response options with too little appreciation for expanding its ad hoc approach to minor, nonmilitarized disputes and crises. Just as it developed flexible response options to complement strategic deterrence during the Cold War, the United States needs a coherent approach to conflict management to address incidents, such as cyber crime and incursions into sovereign territory, that remain below its threshold for a military response.

This is especially clear in the South China Sea, where the drivers of China's

excessive sovereignty claims—including access to fishing and hydrocarbon resources as well as resurgent national pride—have increased in recent years. Yet with each new incident, the United States seems taken aback, scrambling for an effective show of force but ultimately failing to curb the illicit actions. This confusion arises in part because diplomatic and military officials have approached the sovereignty disputes from opposite directions: the Department of State has focused on resolving the disputes while the Department of Defense talks in terms of deterring adversaries, even as both resort to conflict management in practice.

The State Department has approached the disputes through a lens of conflict resolution, arguing that stronger international codes of behavior, military posturing, and strategic dialogue will eventually convince China to abandon its excessive maritime claims. Yet this approach overlooks the intractability of the disputes, causing diplomats to scramble for ad hoc responses as each new incident occurs. A dialogue focused on resolution also misses the point that U.S. interests primarily lie in staying out of the conflicts, not in solving them. While Washington stands willing to back its allies in the event of an armed attack, it has been equally clear that it does not take sides in the South China Sea sovereignty disputes.

U.S. efforts to shape China's behavior without getting drawn into specific disputes have led diplomats to pursue conflict management without clearly admitting they are doing so. For example, the United States has been supportive of a robust and enforceable Code of Conduct on the South China Sea. Such a document could significantly reduce tensions and inspire joint development of disputed waters. While China's resistance and the need for consensus in the Association of Southeast Asian Nations (ASEAN) make it unlikely that a Code of Conduct would be an enforceable document, it would at the least defuse tension by establishing norms of behavior for all claimants. Describing this effort as an element of a conflict management framework would set realistic expectations about the region's ability to manage, but not necessarily solve, disagreements. It would also clarify that Washington's underlying interest is in stability, whether that involves the repeal of excessive claims.

Like the State Department, the U.S. military is already conducting conflict management, but in ad hoc ways and without the benefit of a clearly articulated strategic framework. Many of these actions look like diplomacy: supporting cooperative security mechanisms through ASEAN, talking frankly to Chinese leadership in military-to-military dialogues, and encouraging U.S. allies to maintain a cool-headed response to aggression. A conflict management framework would connect these activities in an approach that is separate from, but complementary to, deterrence.

A clear framework would also help the military balance its priorities for conflict management and deterrence, particularly as resources are reduced. Guidance published in *Sustaining U.S. Global Leadership* in 2012 stated that the U.S. military would "continue to promote a rules-based international order that ensures underlying stability and encourages the peaceful rise of new powers, economic dynamism, and constructive defense cooperation."[2] However, the priority missions articulated in the guidance include deterring adversary aggression and countering adversary antiaccess capabilities, while military efforts to "provide a stabilizing presence"[3] are to be carefully examined in light of shrinking budgets.

Differentiating the military's conflict management activities from deterrence would help to bring it in line with the diplomatic discourse by addressing the behavior of all parties in the dispute. In the South China Sea, nearly all parties have made excessive maritime claims and engaged in provocations. As the United States attempts to reduce tensions without taking sides, it is more useful to think in terms of managing a complex situation than deterring a potential adversary. Establishing a discourse about conflict management would moderate the expectations of allies and alter the "us versus them" dynamic inherent in deterrence, which is by definition directed against a specific adversary. By eliminating an implied adversary, conflict management builds a more inclusive narrative consistent with the view that productive bilateral cooperation is possible despite inevitable points of friction around China's periphery.

Sovereignty disputes in the South China Sea and Senkaku Islands are not the only aspect of the U.S.-China relationship that would benefit from a conflict management framework. Cyber security also falls within the category of confrontations that deterrence is not designed to prevent. As Betts correctly points out, retaliation in response to cyber attacks is rarely credible because of the difficulty of identifying the perpetrator.[4] Conflict management, with its emphasis on mitigating the consequences of recurring attacks, provides a more flexible perspective. Such a framework would encourage open communication, publicly revealing perpetrators rather than fighting back, demonstrating one's own commitment to cyber norms, and galvanizing multilateral support for enforcing those norms. This approach is broad enough to address the myriad cyber criminals who attack government and private-sector systems, while also being more agile than an adversary-focused deterrence strategic framework that risks escalation through retribution.

While its flexibility is ideal for multiparty disputes, conflict management also has a role in cases where there is a clear adversarial relationship. The stalemate with China over Taiwan illustrates the potential benefits of conflict management when an effective military deterrent is in place. Since rapprochement with China in the 1970s, Washington has politically prioritized conflict management in the Taiwan issue, warning Taipei against independence and acknowledging that China has a claim to the island. At the same time, the United States has maintained a deterrent capability through its forward presence in the western Pacific. While various administrations have waffled about whether deterrence or conflict management is more effective, as demonstrated by regular changes in

U.S.-China combined visit, board, search, and seizure team, comprised of Sailors from USS *Winston S. Churchill* and Chinese People's Liberation Army Navy frigate *Yi Yang*, holds briefing aboard *Winston S. Churchill* during bilateral counterpiracy exercise (U.S. Navy/Aaron Chase)

arms sales policies to Taiwan, it is the two approaches working in concert that has provided the greatest stability. This two-pronged approach does not "undermine Washington's readiness for a crisis," as some argue.[5] Rather, it mitigates the likelihood of a crisis while maintaining military readiness.

Easier Said Than Done

Conflict management makes sense for two powerful countries that recognize the costs of war, but a critical shortcoming of conflict management compared to deterrence is that it requires both countries to play along. While deterrence qua mutually assured destruction forced a process of conflict management with the Soviet Union, it fails with China. As the likelihood of an exchange of intercontinental ballistic missiles between Beijing and Washington today has decreased relative to Moscow and Washington in 1962, the influence of deterrence has dissipated, and with it the impetus for robust escalation controls. China often refuses to communicate at moments of high tensions. It has not established a "red phone" with Japan and at times does not respond to its crisis hotline with Washington. Beijing also actively works to undermine ASEAN unity on security issues, recognizing that a united ASEAN can counterbalance its own interests. Michael Swaine maintains that although China understands the dangers of miscalculation, it tends to view conflict in zero-sum terms and has a low threshold for the use of force, possibly to compensate for its perception of relative weakness.[6]

Even in areas where it recognizes the value of strategic dialogue, China has a different approach than the Soviet Union to its relationship with the United States. In testimony before Congress, former Commander of U.S. Pacific Command Admiral Robert Willard pointed to "differences in philosophy regarding the purpose of military-to-military relations in which China emphasizes strategic dialogue and the U.S. seeks comprehensive military contact from the strategic to tactical levels as a way to build confidence."[7]

Optimists hope that gradual military modernization and experience as a world power will help China recognize the importance of tactical military contact for preventing crisis escalation. For example, it was reported on January 19, 2013, that a Chinese warship aimed its fire control radar at a Japanese military helicopter, an action that indicates either a careless radar operator or a precursor to locking on a gun or missile system. Greater military-to-military contact would help to normalize such accidents and clarify intentions. Yet China's willingness to risk its relationship with the United States, in

spite of, or perhaps because of, a strong bilateral strategic dialogue, suggests that China's political maturity alone would not lead to better conflict management. Unilateral U.S. actions to limit the political, economic, and military consequences of enduring disputes would be essential for enduring what promises to be a rocky road ahead.

If It's Broke, Fix It

To progress from a strategic framework based primarily on deterrence to one that integrates requirements for conflict management, the United States should focus on three critical areas: altering the definition of success for longstanding disputes, refocusing U.S. objectives on whole-of-government conflict management activities rather than flexible response options, and encouraging a broader dialogue on security issues and their economic and political impacts.

Perhaps the most significant impact of adding a conflict management framework is that it establishes feasible metrics for success. Deterrence is notoriously difficult to assess. The failure of deterrence to prevent war is readily apparent, but how does one know if a given absence of conflict is caused by a given policy of deterrence? Metrics for conflict management, however, could assess progress even if—or when—an incident occurs. Progress might include implementation of crisis communication mechanisms, incident response procedures, and institutionalized consultations on issues of concern. In addition, success would involve establishing realistic expectations among parties, and identifying "off-ramps" rather than "redlines" to ensure incidents do not escalate to crises. An ideal endstate need not include conflict resolution.

A few examples of moderate successes are already available in the South China Sea. Brunei and Malaysia are jointly developing their overlapping South China Sea maritime claims, and several other parties have shown an interest in multilateral exploration. This approach provides robust conflict management without solving the underlying sovereignty disagreement. The decision of the Philippines to send its claims to an arbitration tribunal is also a success for conflict management. Even if China rejects the findings of the tribunal, the Philippine effort represents a nonmilitary approach to the problem.

With a conflict management mindset, the Intelligence Community should reassess its intelligence, surveillance, and reconnaissance (ISR) in order to address issues before they escalate. While ISR supports both deterrence and conflict management, conflict management prioritizes political and social factors that influence disputes. Tracking fishing boats in the South China Sea may seem a low priority from the classical deterrence perspective, but through the lens of conflict management, its strategic importance is made clear. Twenty-four hours can make the difference in whether Washington is involved in managing a dispute or reacting to a crisis, and imagery of incidents helps clarify who is acting contrary to international norms and galvanizes opinions against the aggressor. As data are disseminated, the United States should also improve coordination across the Intelligence Community and with nongovernmental organizations. Unlike strategic deterrence, the indications and warnings for escalation to crisis go beyond movements of military assets and require a detailed understanding of the broader environment, with special emphasis on both domestic and international political relationships.

In terms of military planning, a conflict management framework would restructure military peacetime objectives. Realistic objectives should acknowledge the limitations of deterrence while focusing attention on preventing escalation of inevitable incidents. The military might come to view disagreements over disputed islands in much the same way it views natural disasters: as detrimental to regional stability but addressed through consistent engagement and capacity-building that supports the work of other governmental agencies. While the Department of Defense must maintain its primary objective of deterring adversary militaries, it should reorient its approach to problems such as cyber security that are not suited to deterrence and address them more as issues of law enforcement.

One important conflict management objective is strengthening partner nation interoperability and combined exercises to reduce the political-military consequences of incidents—an area in which the U.S. military has already made significant progress. The U.S. invitation to China to join the Rim of the Pacific exercises in 2014, for example, contributes to conflict management efforts and should be prioritized accordingly. These activities will be even more important (and should be expanded) as greater military activity in disputed regions increases the risk of escalation. Indonesia, Vietnam, and Singapore are investing in new submarines, and defense spending is on the rise across the region. China has also been more visible since conducting a series of naval exercises in the South China Sea in 2008. A primary mission for the U.S. military in a period of fiscal austerity is to ensure these new forces learn to work and play together—and with the People's Liberation Army Navy. A conflict management framework would prioritize these value-added engagements.

Differentiating deterrence and conflict management as two distinct efforts might generate cost savings by reorienting the military's capability requirements. Whereas a credible military deterrent includes rapidly deployable bombers, aircraft carriers, and ballistic missiles, China used paramilitary vessels and fishing boats to gain control of Scarborough Reef. A U.S. aircraft carrier in Subic Bay is unlikely to dissuade these fishing vessels if its threat of force is not credible. Deterrence still requires an assured conventional response, but at the lower end of the conflict spectrum, destroyers could be as effective as carrier strike groups at demonstrating U.S. resolve to enforce international law, and F-16s are as obvious as F-35s at flying by disputed territories to show the flag. Only by clearly articulating distinct missions in support of conflict management can the military identify the right assets and partners to support nonmilitary confrontation.

However, military activities in conflict management will always be only a small

Pilots from the United States and other nations attend flight deck familiarization tour while onboard U.S. Navy *Oliver Hazard Perry*–class frigate USS *Gary* as part of Rim of the Pacific Exercise 2014 (Royal Australian Navy/Chantell Bianchi)

part of the solution. China's civil and paramilitary aggression requires a civil and paramilitary response. Therefore, more important than expanding the military's role in conflict management is expanding the ability of U.S. law enforcement agencies to conduct capacity-building abroad. The best U.S. interlocutors to develop partner nation capabilities to patrol their exclusive economic zones and manage intrusions during the fishing season are the U.S. Coast Guard and National Oceanic and Atmospheric Administration (NOAA), which leads scientific exploration and fisheries management. Unfortunately, their international reach and blue-water resources are limited, so these organizations must rely on military assets to support their engagement and conflict management activities.

This does not mean that Coast Guard ships should be patrolling the islands in the South China Sea, but rather that nonmilitary agencies should be provided with extensive new resources to do international engagements and capacity-building missions with other partners. The Coast Guard, which primarily operates domestically, has one-sixteenth of the Navy's budget, at just under $10 billion, while NOAA has half that amount. If the United States intends to build regional capabilities to counter China's nonmilitary approach, Congress must ensure other agencies have the bandwidth to engage more internationally. As these resources increase, it might be possible to create a joint task force, similar to U.S. Pacific Command's Joint Interagency Task Force–West for counternarcotics, and to establish truly cooperative approaches to domestic maritime issues, including patrolling exclusive economic zones, managing fisheries, and supporting other law enforcement activities. This professional maritime law enforcement capability would make it more difficult for China to establish and hold its excessive claims. A greater local law enforcement presence would also provide a clearer distinction between military and nonmilitary confrontation compared to a naval vessel operating with law enforcement authorities.

To ensure that partner nation military and law enforcement assets contribute to regional stability rather than undermine it, the United States must continue to support multilateral forums such as ASEAN and the annual China–Japan–Republic of Korea trilateral summit. These forums strengthen relationships among senior leaders, and when tensions are high, they work as a venue for claimants to voice their frustration without resorting to military coercion. During periods of cooperation, the forums could promote agreements on joint resource

development and establish procedures for post-incident investigations. Focusing on institution-building by leveraging international governmental bodies would simultaneously ameliorate pathologies that spread political disagreements and empower multilateral cooperation toward conflict management. The extent to which China undermines these organizations would highlight its disruptive behavior. While this is consistent with the current U.S. approach, a conflict management framework would clarify the intent and purpose of multilateral engagements, particularly for defense cooperation, beyond just reinforcing international norms.

To develop these tools, a serious dialogue about conflict management requires experts from the fields of negotiation, mediation, and arbitration, while incorporating and expanding the tools of preventative diplomacy. Unlike deterrence, this broader dialogue offers an opportunity to better address historical and cultural factors vis-à-vis the most intractable problems in the region.

All of the above initiatives also require that the security dialogue be broadened domestically across the U.S. Government. Twenty-first-century security strategy must be built around the understanding that the domestic affects the international—an understanding which is acknowledged, but not fully implemented. The contemporary geopolitical landscape demands that diplomatic efforts blend with those of the military and vice versa. The crucial strategic move involves a reorientation, not a reallocation, of human and financial capital. Functioning interagency partnerships could be developed by instituting the type of cross-cultural pollination that already exists between the branches of the U.S. military, each of which has its own educational and training systems, while also ensuring that seats are given to officers of other Services. A feasible step to ensure a wide breadth of shared expertise and contacts throughout U.S. and allied public and private organizations is to design an educational system wherein this more eclectic crowd can work and learn together. Few things allow for enduring cooperation like time spent getting to know a comrade in the classroom, coffee shop, and pub.

Such cultural changes needed for a strategic reorientation are not as difficult to execute as they may at first appear, and they could effectively be instituted by congressional legislation. In 1986, Congress passed the Goldwater-Nichols Department of Defense Reorganization Act, which ensures officers gain experience in joint Service positions as a prerequisite for promotion to senior ranks. A similar action would cause a much broader inter-Service outlook by mandating not only joint military Service positions, but also experience working in other nonmilitary departments and organizations entirely. This interagency development would operationalize Joseph Nye's concept of "smart power" and ensure that all elements of national power are brought to bear on the intractable disputes of the Asia-Pacific.

It's a Conflicted World after All

Conflict is endemic and will continue to occur. It is fortunate that, in some ways, we live in a safer world than that of the Cold War. No longer are we routinely forced to duck and cover under our desks to practice protecting ourselves from a nuclear blast. What we are faced with today, however, is hardly a halcyon international environment. If big wars are rare, smaller crises are not. A security strategy focused almost entirely on the rare, at the expense of serious thought and action regarding the common, is not the most useful framework to live with. A coherent security strategy must be both agile and predictable enough to deal with dangerous incidents while also preventing war.

Differentiating conflict management from deterrence would have a tangible impact on the U.S. approach to chronic conflicts in the Asia-Pacific and beyond. A focus on conflict management would improve military support of U.S. national interests by better reflecting the current diplomatic priorities and by refocusing military peacetime planning on new tools and objectives. It would modernize the current security dialogue from one focused on Cold War hard power approaches to one that better leverages civil-military power and the best practices of negotiation. Moving to such a strategic framework would also allow resources of time, money, and talent to be used more effectively to manage the unavoidable, while deterrence would be used to avoid the unthinkable. There is no reason why we should forget about deterrence, but it should not continue to monopolize our strategic thinking. The Cold War is long over, and it is time to implement what is already widely acknowledged but not acted on. Ultimately, by reducing tension and the risk of escalation in the near term, conflict management leaves open the possibility of a more permanent and secure solution in the future. **JFQ**

Notes

[1] Richard K. Betts, "The Lost Logic of Deterrence," *Foreign Affairs* (March–April 2013), 99.

[2] *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: Department of Defense, January 2012), 2, available at <www.defense.gov/news/defense_strategic_guidance.pdf>.

[3] Ibid., 5.

[4] Betts, 88.

[5] Ibid., 96.

[6] Michael D. Swaine, passim, Carnegie Endowment for International Peace, Latest Analysis, available at <http://carnegieendowment.org/experts/index.cfm?fa=expert_view&expert_id=119>.

[7] Robert F. Willard, "Statement before the Senate Armed Services Committee on U.S. Pacific Command Posture," February 28, 2012, 8.

Soldier aims XM-25 weapon system, Aberdeen Test Center, Maryland (U.S. Army)

Nonlethal Weapons

A Technological Gap or Misdefined Requirements?

By Ofer Fridman

The internal and international conflicts that have taken place in the last few decades have significantly raised the issue of interacting with with civilian populations, a problem that has been worsened by urbanization. In the last few decades of the 20th century, a universal respect for human life became a crucial variable within the international community in general and Western societies in particular.[1] In this new political reality, the military seeks new technologies that have "greater precision, shorter duration, less lethality, and reduced collateral damage . . . [as these technologies] may provide more effective power than their larger and more destructive, but also more inexact and crude, predecessors."[2] Nonlethal weapons (NLW) would seem to be the perfect answer for this military quest; however, observers point out that, to date, "few non-lethal weapons incorporating new technologies have actually been deployed on a large scale"[3] and that "operational use of available non-lethal weapons by the military has been limited."[4] Despite the reasonable demand for the employment of less lethal military technologies on the battlefield, then, it seems that such technologies are still far from becoming a reality.

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German soldiers form crash line at riot control training on Joint Multinational Readiness Center in Hohenfels, Germany, October 2014 (U.S. Army/Lloyd Villanueva)

In 2009, the U.S. Government Accountability Office (GAO) reported that "the joint non-lethal weapons program has conducted more than 50 research and development efforts and spent at least $386 million since 1997, but it has not developed any new weapon."[5] There are three possible explanations for this detrimental situation: ineffective management of the provided resources, significant technological gaps that cannot be filled within the framework of the existing funding, or an incorrect translation of the desired capabilities into the technological requirements that define these gaps. In other words, the current situation with NLW has been caused by one of the following: ineffective management by the Department of Defense (DOD), insufficient resources, unbridgeable technological gaps, or the misdefinition of these gaps. While the GAO report points at DOD's ineffective management as the main reason for the inability to field operationally useful NLW, this article argues that the main problem can be found in misdefined requirements for nonlethal weapons that, in their turn, lead to incorrect characterization of technological gaps.

NLW in the U.S. Military

In the early 1990s, the American military was caught up in the theory of a revolution in military affairs, which consisted of the implementation of new military technologies combined with fundamental shifts in military doctrine and organization. Speculations about new military technologies that have revolutionary potential did not overlook NLW; for example, a prominent think tank held that "if U.S. forces were able . . . to incapacitate or render ineffective enemy forces without destroying or killing them, the U.S. conduct of war would be revolutionized."[6]

DOD started to pay more coherent attention to nonlethal weapons in 1995 during Operation *United Shield*, the effort where U.S. forces supported the withdrawal of United Nations peacekeepers from Somalia. The process of the institutionalization of NLW in DOD was led by a Non-Lethal Weapons Steering Committee established in 1994 and was promoted by groups such as the Council on Foreign Relations. The process was finalized in 1996 with the establishment of the Joint Non-Lethal Weapons Program (JNLWP). In July 1996, DOD Directive 3000.3, "Policy for Non-Lethal Weapons," defined *nonlethal weapons* as "[w]eapons that are explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment."[7]

Since 1996, the JNLWP has had five defined missions: identifying and understanding current and projected operational requirements and capability

Mongolian police officer operates X26 taser during nonlethal weapons training at Five Hills Training Area, Mongolia, August 2013
(U.S. Marine Corps/Ben Eberle)

gaps; identifying and developing technologies into operationally suitable and effective less lethal solutions that are cost-effective; facilitating the acquisition and fielding of less lethal capabilities; advancing awareness of policy and public understanding through strategic communication and support for education and training; and efficiently managing resources and support.[8] However, despite 18 years of activity and millions of dollars spent, most of the NLW that have been adopted by the military are commercial off-the-shelf systems produced for the law enforcement market (for example, Taser X26, Long-Range Acoustic Device, and FN 303 riot gun) rather than a product of JNLWP research and development.[9] Moreover, the flagship of the JNLWP's activity and investment, the Active Denial System, has never been used.[10]

Today it seems that the promised revolutionary change offered by NLW is still far out. This raises the obvious question of whether these systems are necessary on the current and future battlefield because only the existence of such a necessity could justify efforts to improve the current detrimental situation with NLW.

Does the U.S. Military Need NLW?

An understanding of the necessary military capabilities requires a comprehensive analysis of current and future threats, possible adversaries, broad political and military environments, and many other noteworthy factors. In an attempt to answer the question of the relevance of NLW on the modern battlefield, this article analyzes three primary official documents that consider all required aspects and define current and future military environments: the Joint Chiefs of Staff's *Capstone Concept for Joint Operations: Joint Force 2020* (CCJO); DOD Defense Science Board's *Challenges to Military Operations in Support of U.S. Interests* (CMOSUSI); and U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-66, *Force Operating Capabilities* (FOC).

The purpose of CCJO is to provide general guidelines for future force development and describe the future operating environment. Its main concept, *globally integrated operations*, defines how the joint force should prepare itself for the future security environment. Describing one of the key elements of this concept, the CCJO states:

Future Joint Operations will be increasingly discriminate to minimize unintended consequences. The increased transparency of the future security environment . . . heightens the need for force to be used precisely when possible. . . . In the saturated information environment of tomorrow, even minor lapses in conduct or application of fires could seriously damage the international reputation of the United

States. This reality places a premium on joint operations informed by values and professionalism.[11]

In other words, while the CCJO calls for increasing competence of the future joint force, it also states that undesired collateral damage would compromise U.S. activity and therefore has to be minimized. In addition to this statement in the CCJO, the Defense Science Board's report, which focuses on challenges that the United States has to be prepared for, clearly argues that "with respect to the human toll on innocent civilians, the U.S. strategy is to reduce 'collateral damage.'"[12]

Unlike the CCJO and CMOSUSI, TRADOC's FOC is a more specific document that formulates force operation capabilities desired for the U.S. Army in the short and long term. It analyzes the future security environment and describes specific military capabilities and requirements for future forces. Describing the complex nature of future conflicts, the FOC states:

While the nature of war will remain a violent clash of wills between states or armed groups pursuing advantageous political ends, the conduct of future warfare will include combinations of conventional and unconventional, lethal and nonlethal, and military and nonmilitary actions and operations, all of which add to the increasing complexity of the future security environment.[13]

In the section that describes the desired maneuver support, the FOC continues:

The major combat operation focus, coupled with the increasing likelihood of smaller-scale contingencies, clearly establishes the need for a full spectrum force. This force must be able to: execute [the] *full spectrum of forces; minimize noncombatant fatalities, permanent injury, and undesired damage to property and environment; maintain force protection, reinforcing deterrence; and expand the range of options available to joint force commanders. All of these imperatives demonstrate a clear need for nonlethal weapons, even in conjunction with lethal weapons, to achieve a decisive outcome.*[14]

The FOC describes the future security environment as an increasingly complex one that will include a vast spectrum of operations, but it clearly states that nonlethal actions will unquestionably be a part of future conflict. Moreover, it defines the ability to *minimize noncombatant fatalities and undesired damage* as an option that has to be available to joint force commanders.

Thus, all three documents emphasize the need to minimize collateral damage and harm to innocents during future military confrontations. The first two formulate this general requirement and point toward the possible solution that is inherent in higher professionalism, better intelligence, better targeting, and precision weapons; the FOC translates this general requirement into feasible capabilities that should be provided by NLW. According to the FOC, nonlethal weapons should enhance the capability of the joint force in accomplishing the following objectives:

(a) Discourage, delay, or prevent hostile actions; (b) Limit escalation; (c) Take military action in situations where the use of lethal force is either not the preferred option, or is not permitted under the established Rules of Engagement (ROE); (d) Better protect our forces; (e) Disable equipment, facilities, and enemy personnel; (f) Engage and control people through civil affairs operations and Psychological Operations (PSYOP); (g) Dislodge enemy from positions without causing extensive collateral damage; (h) Separate combatants from noncombatants; (i) Deny terrain to the enemy.[15]

The analysis of these three fundamental documents clearly demonstrates that minimizing collateral damage and noncombatant fatalities is a military capability required by the reality of present and future conflicts, and NLW can be a practical tool in achieving this capability. There is no doubt that the U.S. military has to develop this capability to be prepared for future operations, and consequently, there is an obvious necessity to field operationally useful NLW. While there are many different possible reasons that can explain the current lack of such NLW (for example, the GAO report mentioned above), the following examination suggests that the main cause is a failure to translate the demand described above into appropriate NLW policies and requirements.

Current Policies and Requirements

DOD Directive 3000.3E lists 10 different capabilities that NLW can provide to joint forces. According to the directive, NLW have the potential to enhance the commander's ability to:

(1) Deter, discourage, delay, or prevent hostile and threatening actions; (2) Deny access to and move, disable, and suppress individuals; (3) Stop, disable, divert, and deny access to vehicles and vessels; (4) Adapt and tailor escalation of force options to the operational environment; (5) Employ capabilities that temporarily incapacitate personnel and materiel while minimizing the likelihood of casualties and damage to critical infrastructure; (6) De-escalate situations to preclude lethal force; (7) Precisely engage targets; (8) Enhance the effectiveness and efficiency of lethal weapons; (9) Capture or incapacitate high value targets; (10) Protect the force.[16]

While these capabilities emphasize the nature of NLW, they insufficiently suit the general demand described in the CCJO and CMOSUSI documents—minimizing noncombatant fatalities on the battlefield. Furthermore, this list does not correspond with the required capabilities as defined by the FOC. For example, translating the complexity of the future battlefield and undesired consequences of collateral damage, the FOC accurately argues that nonlethal weapons have to be able to "dislodge [the] enemy from positions without causing extensive collateral damage" and "separate combatants from noncombatants." Unfortunately, these significant characteristics are not in the DOD directive, which in essence defines

U.S. Navy unmanned surface vessel is equipped with cameras, computer systems, and nonlethal weapons during Trident Warrior (U.S. Navy/Betsy Knapper)

policy and, therefore, the aims of the future development of NLW.

The Non-Lethal Weapons Requirement Fact Sheet (NLWRFS) is an official document published by the JNLWP that generalizes two initial capabilities documents and identifies requirements for nonlethal effects. The JNLWP is interested in investment in and promotion of new NLW that can support the tasks listed in the fact sheet. For example, the NLWRFS defines the following four counterpersonnel required tasks for NLW: "(1) Deny access into/out of an area to individuals (open/confined) (single/few/many); (2) Disable individuals (open/confined) (single/few/many); (3) Move individuals through an area (open/confined) (single/few/many); (4) Suppress individuals (open/confined) (single/few/many)."[17]

Like DOD Directive 3000.3E, this list again does not correspond with the desired capabilities defined by the FOC, and, therefore, barely addresses the future threats on the battlefield discussed in the CCJO and CMOSUSI.

Furthermore, on the one hand, the NLWRFS states that it addresses "specific non-lethal capability requirements for U.S. forces operating in complex environments."[18] On the other hand, it barely corresponds with the desired NLW capabilities and requirements as defined by FOC:

The future Modular Force, specifically, must be provided with organic nonlethal capabilities to disrupt, dislocate, disorganize, disintegrate, fix, isolate, suppress, and destroy enemy functions. Joint force commanders (JFCs), furthermore, must be provided with multifunctional/multirole lethality options in integrated multipurpose system configurations. . . . The future Modular Force Soldier must have the ability to employ a wide array of lethal and nonlethal munitions based upon mission need and force protection.[19]

The fact sheet neither refers to the whole spectrum of desired capabilities defined by FOC nor addresses one of the most important requirements—namely, that nonlethal weapons "must be provided with multifunctional/multirole lethality options in integrated multipurpose systems."[20] The NLWRFS fails to define required NLW as weapons that have an adjustable level of lethality and are integrated in multipurpose weapons systems; in other words, it fails to require the need, as correctly defined by the FOC, for weapons systems that integrate nonlethal and lethal capabilities.

As shown, DOD Directive 3000.3E and the NLWRFS clearly misdefine the required NLW capabilities and mislead the development of future NLW, decreasing the chances of new nonlethal technologies emerging that answer the demands of the future complex security environment. Thus, the analysis indicates that these two authoritative documents pave the way for NLW in an *incorrect* way, allowing an adaptation of off-the-shelf law enforcement technologies. The joint force is not a law enforcement agency, although it sometimes fulfills similar missions; therefore, military oriented nonlethal weapons have to be more

Marines from 1st Law Enforcement Battalion conduct first ever live fire with Non-Lethal/Tube-Launched Munition System, Camp Pendleton, California, September 2014 (U.S. Marine Corps/John Baker)

versatile and more integrated. While there is no expectation that the U.S. warfighter in Afghanistan will replace the M16 rifle with the Taser X26, FN 303, or Oleoresin Capsicum Dispenser, these nonlethal capabilities have to be integrated with the warfighter's M16 or other lethal weapons systems. This argument, however, raises the question about the ability to bridge the technological gaps related to such integration.

A Technological Gap (or Lack of It)

The current policies regarding nonlethal weapons clearly mislead military industries in defining the required capabilities. To address the existing and future threats created by the increasing complexity discussed by the CCJO and CMOSUSI, nonlethal weapons have to answer the capabilities emphasized by the FOC—versatility and integration with existing lethal weapons systems. On the one hand, the JNLWP, and therefore DOD, do not define these capabilities as a technological gap that has to be bridged. On the other hand, examples of such systems are already employed by the U.S. military or are under development. Moreover, certain systems developed by foreign manufacturers clearly demonstrate the ability to integrate nonlethality with and within lethal systems.

Regarding U.S. technologies, the best example is the M26 Modular Accessory Shotgun System (MASS). It is an underbarrel shotgun attachment for the M16 that, while preserving the lethal capability of the main rifle, simultaneously provides a warfighter with an additional capability of 12-gauge nonlethal ammunition.[21] Unfortunately, MASS has remained outside the JNLWP scope of interest. Other good examples of emerging systems are the XM25 and 81 millimeter (mm) Non-Lethal Indirect Fire Munitions (NLIFM). The first is a 25mm air burst grenade launcher with various lethality, from highly lethal to nonlethal depending on the type of ammunition.[22] The second system expands the existing capabilities of the M252 81mm mortar into the field of nonlethality.[23] Unfortunately, again, these

two systems are not in the JNLWP's focus. (The NLIFM was reported in the JNLWP annual review, but it is not included in the lists of current, developing, or future NLW supervised by the JNLWP.[24])

Given the achievements of international industries in the field of integrated nonlethal capabilities, it is important to look at Russia and Israel. In the last few years, Russian industries successfully demonstrated a range of nonlethal munitions based on irritant agents—munitions for rocket-propelled grenade launchers, different caliber mortar shells, heliborne KMGV-type dispensers, and even 500 kilogram cluster air bombs.[25] Alternatively, in Israel, the Israeli Military Industries propose the 120mm stun cartridge for tanks,[26] and a private company, L.H.B. Ltd., offers an attachment of an upgraded Russian-made compact kinetic less-lethal pistol PB-4-2, which can be attached as a foregrip to any lethal rifle.[27]

While there is no confirmation that these nonlethal weapons have been adopted by the Russian or Israeli military, the mere fact of their existence clearly shows the technological ability to integrate lethal and nonlethal systems. Moreover, nonlethal capabilities of weapons, such as MASS, XM25, and NLIFM, demonstrate that American military industry understands the gap in the desired NLW capabilities of U.S. forces and—even without the direct lead of the JNLWP or DOD—is able to produce such capabilities.

Conclusion

In 2012, the previous director of the JNLWP, in addressing the problem of NLW, published an article titled "From Niche to Necessity" in this journal, which stated that "accepting nonlethal weapons as an integral element of the warfighter's toolkit requires a cultural shift that is counterintuitive to the military, which understandably emphasizes the use of lethal force."[28] This shift has to start with the Joint Non-Lethal Weapons Program itself and the way in which it defines the desired NLW. As discussed, there is a pressing need for integrated NLW that will provide warfighters with the capabilities to minimize noncombatant casualties and collateral damage. To meet that necessity, DOD in general, and the JNLWP specifically, have to translate that need and incorporate it into their NLW policies and requirements.

Since World War II, the U.S. military has been the technological leader in military affairs, and the American military-industrial complex has been able to deal with all the technological challenges that confront it. Taking nonlethal weapons out of their niche and creating technologies that will answer the emerging necessity should not pose an enormous technological gap; it is a question of the right definition of the desired capabilities that will focus research and development efforts. **JFQ**

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Servicemember trained as tactical critical care evacuation team nurse prepares for patient transfer mission at Forward Operating Base Orgun East, Afghanistan (U.S. Air Force/Marleah Miller)

Challenges to Improving Combat Casualty Survivability on the Battlefield

By Robert L. Mabry

We succeed only as we identify in life, or in war, or in anything else, a single overriding objective, and make all other considerations bend to that one objective.

—Dwight D. Eisenhower

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The United States has achieved unprecedented survival rates (as high as 98 percent) for casualties arriving alive to a combat hospital.[1] Official briefings, informal communications, and even television documentaries such as "CNN Presents *Combat Hospital*" highlight the remarkable surgical care taking place overseas. Military physicians, medics, corpsmen, and other providers of battlefield medical care are rightly proud of this achievement. Commanders and their troops can be confident that once a wounded Servicemember reaches the combat hospital, his or her care will be the best in the world.

Combat casualty care, however, does not begin at the hospital. It begins in the field at the point of injury and continues through evacuation to the combat hospital or forward surgery. This prehospital phase of care is the first link in the chain of survival for those injured in combat and represents the next frontier for making significant improvements in battlefield trauma care.

Even with superb in-hospital care, recent evidence suggests that up to 25 percent of deaths on the battlefield are potentially preventable.[2] The vast majority of these deaths happen in the prehospital setting. The indisputable conclusion is that any meaningful future improvement in combat casualty outcomes depends on closing the gap in prehospital survival. Improving prehospital combat casualty care, however, may be significantly more challenging than improving hospital-based casualty care because of significant structural challenges facing the military medical establishment. I describe five key challenges and a plan to overcome them.

Challenge 1: Ownership

Responsibility for battlefield care delivery is distributed to the point where seemingly no one "owns" it. Unity of command is not established, and thus no single senior military medical leader, directorate, division, or command is solely focused on battlefield care, the quintessential mission of military medicine. This diffusion of responsibility is a result of multiple agencies, leaders, and units of the Service medical departments each claiming bits and pieces, with no single entity responsible for patient outcomes forward of the combat hospital. Combat arms commanders "own" much of the battlefield casualty care assets in that medics, battalion physicians, physician assistants, flight medics, and associated equipment are assigned to their operational units, yet combat arms commanders are neither experts in, nor do they have the resources to train their medical providers for, forward medical care. Commanders rely on the Service medical departments to provide the right personnel, medical training, equipment allocations, doctrine, and the medical force mix in their units. In turn, while the institutional base trains and equips the combat medical force, it defers the responsibility of battlefield care delivery to line commanders. While this division of responsibility may at first glance seem reasonable, the net negative effect of line commanders lacking expertise and medical leaders lacking operational control has been documented.[3] The axiom "when everyone is responsible, no one is responsible" applies.

The concept of Tactical Combat Casualty Care (TCCC) evolved to fill this gap for line commanders. Originating from a paper published in *Military Medicine* in 1993,[4] TCCC created a conceptual framework focused on treating life-threatening battlefield injuries while taking into account tactical considerations. A Navy physician and former SEAL team member, Dr. Frank Butler spearheaded what has now emerged as the most significant battlefield medical advancement of the past decade. Before the advent of TCCC, combat medics were taught civilian-style first aid. Many of these techniques, based on civilian injury patterns such as motor vehicle accidents, were unhelpful or frankly dangerous when performed under fire.

The Committee on TCCC (CoTCCC) is organized under the Joint Trauma System and is responsible for promulgating the tenets of TCCC. Its origins were nontraditional, reflecting a grassroots effort by a dedicated group of surgeons, emergency physicians, and experienced combat medics to incorporate new evidence and best practices into prehospital treatment guidelines. As a paradigm, it is thoroughly grounded in the realities of the modern battlefield. The very existence of the CoTCCC, an organization born outside the traditional military medical establishment, exposes a void in ownership and expertise in battlefield care.

In contrast to combat casualty care, other areas of the military medical establishment are led by flag officers. In the Army Medical Department, for example, brigadier generals lead veterinary medicine and warrior transition care. Dentistry and nursing are both led by major generals. Battlefield care would strongly benefit from similar centralized senior leadership. Establishing organizational ownership such as a battlefield medicine directorate, division, or command is the key first step.

Challenge 2: Data and Metrics

The Services' medical departments repeatedly cite the reduction of case fatality rates to historically low levels as a major medical accomplishment during operations in Iraq and Afghanistan. While seemingly positive, this statistic tells only part of the story. The case fatality rate, or the percentage of those injured who died, reflects multiple factors including weapons and tactics, protective equipment, and medical care.[5] In other words, current data equally support the conclusion that the enemy's lack of regular combat units, artillery, and armor (the major casualty producers in conventional warfare) and reliance instead on improvised explosive devices is plausibly just as responsible. While many intended improvements have been made in military trauma systems, especially at the combat hospital and higher, there are few data to link specific actions to a direct and quantifiable relationship to lowered case fatality rates. Repeatedly citing "the lowest case fatality rate in the history of warfare" as an affirmation of military medicine's success over the past decade, without a sober account of other contributory and confounding factors, risks sending the message that battlefield trauma systems are nearly perfected and no further significant improvements are required or even possible.

Another problematic statistic is the "died-of-wounds" (DOW) rate, or the percentage of those reaching medical care who later die. Remarkably, recent DOW rates exceed those of World War II and the Vietnam era.[6] While startling, this does not necessarily reflect a decline in care. As evacuation becomes faster and prehospital care improves, the DOW rates will go up as more mortally injured casualties will reach the hospital alive.

Conversely, if evacuation is delayed or medic care is poor, more will die in the field and reduce the DOW rate. Neither the DOW nor the case fatality rate quantifies the effect of medical care on survival, nor do they provide insight into where specific improvements in combat casualty care can be made.

Another statistic that distorts the overall effectiveness of combat casualty care is the hospital survival rate. Surgical care in combat hospitals and care in the subsequent evacuation chain back to the United States have advanced to such a degree that 98 percent of casualties making it there alive will go on to survive their wounds. By definition, it does not capture those with potentially survivable injuries who died in the field or died during prehospital evacuation. In other words, it does not speak to all of the casualties who succumb prior to hospitalization. What is needed is a metric encompassing the full spectrum of care that includes the prehospital setting.

In contrast, the potentially preventable death rate illuminates where care can be improved along the entire chain of survival, from the point of injury to rehabilitation back in the United States. This rate is defined as deaths that could be avoided if optimal care could otherwise be delivered. The challenge of deriving this statistic comes from the complexity in determining if a death is potentially preventable. To accomplish this, specific clinical facts must be collected on each case; however, as we discuss shortly, prehospital data are often difficult to collect.

The potentially preventable death rate is derived by examination of autopsy and medical records by a multidisciplinary physician panel. One such review examined all the U.S. combat deaths in Iraq and Afghanistan from 2001 until 2011 and found up to 25 percent to be potentially preventable.[7] The vast majority of these (87 percent) died before reaching a surgeon or combat hospital. Many of the remaining 13 percent who died in the hospital were in profound shock on arrival and would have likely benefited from aggressive prehospital resuscitation. It is important to recognize that this figure, like the DOW rate, does not necessarily reflect inadequate care. All of these casualties were severely injured. Some would have required immediate, on-the-spot access to the most advanced care (that is, the kind found only in premier trauma centers in the United States) to have any hope of survival, and others died related to unavoidable delays due to ongoing combat operations (for example, hostile fire). However, many could have survived with currently available prehospital medical interventions if only these interventions were routinely and correctly employed. Unfortunately, we continue to know little about what care is provided before casualties reach the combat hospital.

The key goal is a coherent system to collect prehospital patient care information. We know little about this phase of care.[8] Only one military unit we are aware of, the U.S. Army's 75th Ranger Regiment, has collected complete sets of casualty care data. The commander of the 75th Ranger Regiment has taken ownership of that unit's casualty response system. Using their Ranger Casualty Card and their unit casualty registry, unit leaders are able to determine what happened to every Ranger casualty during all phases of care. Ranger commanders routinely use this data to improve their casualty response systems. The Rangers are also the only unit in the U.S. military that can demonstrate no potentially preventable deaths in the prehospital setting after more than a decade of combat.[9]

Systematically examining potentially preventable deaths and prehospital care data gives a more accurate assessment of the entire continuum of care compared to other metrics. If collected and analyzed quickly, it also allows for the development of an agenda to improve casualty care in near real time. The Israel Defense Forces (IDF) medical corps has embraced the concept of eliminating preventable deaths as part of the next 10-year force build-up plan and emphasizes point-of-injury care.[10]

A significant recent positive example of data-driven combat casualty care improvement concerns the capabilities of medics staffing medical evacuation (medevac) helicopters, which have traditionally been staffed by medics trained at the basic emergency medical technician level. Staffing civilian medical helicopters with advanced paramedics has been done since the 1980s and advocated for military medevac since the 1990s. A recent study comparing a National Guard medevac unit staffed with flight paramedics trained in critical care showed a 66 percent reduction in mortality compared to the standard flight medics.[11] The Army adopted a program—after nearly 40 battlefield after-action reports recommended it but lacked detailed supporting data—in 2011 to train critical care paramedics for helicopter medevac. With better data collection in the prehospital setting, it is likely the decision cycle could be far reduced from the 11 years observed.

Changing the narrative of "unprecedented" survival rates to instead highlight the 25 percent potentially survivable death rate does place military medicine in a difficult strategic communications predicament. A fair and open accounting of the successes to date as well as where progress needs to be made is imperative. In 1984, Dr. Ron Bellamy examined many of the same issues discussed here following analysis of Vietnam-era casualty data. He noted, "A research program designed to improve health care delivery will have the greatest impact if its goals are chosen after a comprehensive review has been made in the ways of which the existing system fails."[12] A similar comprehensive review of combat casualty care in Iraq and Afghanistan is recommended.

Challenge 3: Prehospital and Trauma Expertise

If the prehospital setting is the area where nearly all potentially preventable deaths occur, then it is likely not coincidentally an area of limited organizational expertise. It would be natural to expect that the Services, especially the ground forces, would invest heavily in clinical experts in far-forward combat casualty care. Paradoxically, the opposite appears true. The Army, for example, relies on the Professional Officers Filler System (PROFIS) to provide the bulk of forward medical officers. PROFIS is a Cold War–era program whereby primary care physicians from the base

Soldier from 1st Stryker Brigade Combat Team, 25th Infantry Division, based in Fort Wainwright, Alaska, gives thumbs-up to members of his unit after being injured by roadside bomb in Kandahar Province (DOD/Haraz Ghanbari)

hospital are tasked, often just before combat deployment, to serve as battalion surgeons responsible for the resuscitation of battle casualties in the battalion aid station. This is reminiscent of how emergency rooms (ERs) were staffed in the 1960s and 1970s, when junior physicians just out of training (or disinterested physicians from unrelated specialties) were rotated into the ER. Like the PROFIS physicians, these physicians had no in-depth training in resuscitation or emergency care or, worse, little interest in even learning it. Many of these PROFIS physicians, often inexperienced and unprepared, are placed into operational positions outside the scope of their training. This professionally unrewarding experience likely contributes to many leaving the military at the first available opportunity.[13]

The Korean and Vietnam wars set the stage for the emergence of modern emergency medical services (EMS) systems in the late 1960s. These wartime experiences spurred the development of a robust "system of systems" comprised of emergency medical technicians, ambulances, communications, training programs, medical direction, and trauma centers that integrate prehospital and hospital trauma care. The investment paid off as trauma centers opened in nearly every major urban center, and large swaths of the population are now served by effective and cohesive trauma care systems. Yet the combat casualty on the battlefield today, like the accident victim in the 1960s ER, is likely attended to by a physician or physician assistant with no formal training in emergency medicine or trauma resuscitation. In the intervening years, ERs and the physicians who staff them have evolved into a sophisticated and specialized system of care, while the model for physician care in forward aid stations remains largely stuck in the practices of the past century.

Since the 1980s, programs have emerged to train physician specialists in trauma surgery, emergency medicine, and prehospital care. Without a major conflict since the emergence of these new specialties, there simply has not been a demonstrated need for them in the military until now. Nor has there been a critical appraisal of how these relatively new specialties could be leveraged to optimize combat casualty care. For example, the Department of Defense has only one relatively new prehospital training program capable of training three physicians per year. Today, the Army has fewer than a dozen prehospital physician specialists and about the same number of trauma surgeons on Active duty. By comparison, the Army has roughly the same number of radiation oncologists and nearly three times the number of pediatric psychiatrists and orthodontists. This is largely because medical specialty allocations are based on traditional peacetime beneficiary care needs. Refocusing on the wartime needs could populate key institutional and operational billets with a critical mass of trained prehospital and trauma specialists and drive further advances in battlefield care during peacetime.

Flight medic treats Soldier from 1st Stryker Brigade Combat Team, 25th Infantry Division, while en route to Kandahar Airfield for additional treatment (DOD)

Challenge 4: Research and Development

Current research and development efforts are focused on material "things," and our current medical combat development efforts are primarily focused on rearranging existing paradigms for doctrine, manpower, and equipment. Less attention is paid to training, leadership, and organization, yet the current literature shows these areas have made the most significant documented improvements in survival. Three examples can illustrate the potential for capitalization. First, the Rangers, with their commander-led casualty response system, are able to document no potentially preventable prehospital deaths after more than a decade of combat.[14] Second, staffing a forward battalion aid station with emergency medicine–trained providers showed a 30 percent reduction in deaths.[15] Third, adopting current civilian air ambulance standards during helicopter evacuation in Afghanistan showed a 66 percent reduction in the risk of dying.[16] The training level and capabilities of the providers in these examples exceeded the existing doctrinal model, and the benefits were tangible. The solution lay with people, not technology. Using a sports analogy, the Department of Defense is spending billions of dollars trying to perfect golf clubs, golf balls, and golf shoes, and virtually no research dollars on how to train the best golfers.

Prehospital care experts should direct and advise key research and development efforts and set research priorities focused on improving prehospital casualty survival. Traditional measures of research program success (grants awarded, papers published, and abstracts presented) should be shifted in favor of measurable solutions to specific battlefield problems (such as reducing preventable death, improving procedural success, and reducing secondary injury).

To be sure, advanced technology can pave the way for enhanced combat casualty care. Examples of recent tools placed in the hands of medics and battalion medical officers include tourniquets, junctional hemorrhage control devices, and intraosseous needles. Yet many of these so-called new tools and concepts have existed for decades or even centuries. With the exception of the hemostatic dressing, no new technology has been put into the medic's aid bag today that did not exist a century ago. The proposition is to balance the investment between things and people to optimize care on the battlefield.

Challenge 5: Hospital Culture

The delivery of health care in fixed facilities is military medicine's largest

mission, dwarfing all the others. At a cost of nearly $60 billion, the Military Health System (MHS) represents one of the most expensive components of the overall defense budget and is under constant scrutiny from Pentagon leaders. Former Assistant Secretary of Defense for Health Affairs Dr. Sue Bailey stated that "we are an HMO [health maintenance organization] that goes to war," a statement that sums up a continuing concept regarding military medicine's primary focus on beneficiary care at fixed facilities. Indeed, when physicians are tasked to deploy from hospitals in the United States to the combat zone, a regulation calls them "fillers," and hospital personnel officers colloquially refer to the loss of skilled physicians as "the operational tax."[17]

Regarding the combat medics' role, the traditional conceptual framework for some medical leaders starts not at the point of injury but rather in the combat hospital (or forward surgical team): "Get the casualty to the hospital and we will take care of them." This is a legacy of the Cold War era when the combination of massive casualties and limited far-forward capability meant few meaningful interventions were possible until the casualty reached a combat hospital.[18] Today, we know the actions or inactions of the ground medic, flight medic, or junior battalion medical officer *can* mean the difference between delivering a salvageable casualty or a corpse to the combat hospital. We expect medics to perform life-saving treatment under the most difficult of circumstances, but we invest minimal institutional effort toward training them to a high level or insisting they train alongside physicians and nurses in our fixed military hospitals during peacetime.

In their defense, military medical leaders face a unique set of challenges combat arms commanders do not face. Combat arms commanders focus on preparing for war. When not deployed or in a recovery or support cycle, they are focused on training and preparing for the next mission. Conversely, the MHS is expected to perform its mission of delivering high-quality healthcare to military beneficiaries in its fixed facilities every day *and* be prepared to go to war at a moment's notice. Historically, the overwhelming pressures of providing beneficiary care in clinics and hospitals have conspired to redirect resources away from maintaining or improving battlefield care skills during peacetime.[19] Future efforts should be devoted to breaking free from this seemingly intractable constraint.

A Way Forward

If history is any guide, making significant interwar advancements in battlefield medical care will be difficult. As the current conflicts end, repeating the narrative of low case fatality and high survival rates without a comprehensive and sober review of both successes and where improvements could be made risks impeding the ability to truly learn the lessons that would improve the survival of Soldiers, Marines, Sailors, and Airmen in the next conflict.

As a call to action, the following steps offer a potential way forward to overcome these five challenges.

- Adopt the Israel Defense Forces or similar model of combat casualty care focus and make an institutional commitment to eliminating potentially preventable death. Allow careful study of these deaths to drive the training, research, and development agenda.
- Establish leadership of battlefield care at the most senior level, and hold the Service medical departments accountable for improving it.
- Obtain data and metrics from the point of injury and throughout the continuum of care, and use this information to drive evidence-based decisions.
- Commit to training physician, nursing, and allied health providers to become "combat medical specialists" and placing them in key operational and institutional positions to leverage improvements in training, doctrine, research, and development.
- Direct research funds toward solving prehospital clinical problems, and balance these funds to include research on training, organization, and leadership, not just material solutions.
- Evolve the current paradigm of military medicine from an organization culture chiefly focused on full-time beneficiary care in fixed facilities and part-time combat casualty care—the "HMO that goes war"—toward an organizational culture that treats battlefield care delivery as its essential core mission. This need not lessen the importance or scope of beneficiary care and, if agilely executed, could enhance the prestige and cachet of the beneficiary mission.

Addressing leadership, strategy, metrics, workforce, and patient outcomes is the common methodology for promoting excellence in hospital-based healthcare. The same methodology could be used to improve care forward of the hospital. Such a program would require a significant realignment of resources and priorities within military medicine that would challenge existing bureaucratic and leadership hierarchies. Acting on what we have learned to prepare for the next conflict in a resource-constrained interwar period will challenge our medical leaders. Civilians can operate peacetime hospital systems, perhaps even more efficiently than the military. Yet ultimately, going to war is the unique mission of military medicine that distinguishes us from civilian healthcare and justifies our cost to the Nation. If military medicine cannot demonstrate ownership of and expertise in its quintessential mission, prehospital and battlefield trauma care, we must ask ourselves why military medicine exists. JFQ

Notes

[1] The author would like to recognize Surgeon Commodore Alasdair Walker, the United Kingdom's Military Health Services' Medical Director, as the inspiration for this article. During the 2013 Military Health System Research Symposium in Fort Lauderdale, Florida, Dr. Walker described a concept called the "Walker Dip." Citing the abysmal medical care available to British forces during the Crimean War, he traced recurrent historical cycles whereby medical care improves during con-

Aeromedical evacuation technician with 651st Expeditionary Aeromedical Evacuation Squadron checks on Afghan man in critical but stable condition for transport, Forward Operating Base Tarin Kowt, Afghanistan (U.S. Air Force/Greg Biondo)

flicts, but the lessons are forgotten afterward and have to be relearned again during the next war, thus repeating the cycle. The Walker Dip can be traced from the American Civil War through every U.S. conflict since, including Iraq and Afghanistan. The author hopes this discussion will help the U.S. military health system avoid the Walker Dip and thanks Dr. Walker for his inspiration.

[2] Brian J. Eastridge et al., "Death on the Battlefield (2001–2011): Implications for the Future of Combat Casualty Care," *Journal of Trauma and Acute Care Surgery* 73, no. 6, Supplement 5 (December 2012), S431–S437; Joseph F. Kelly et al., "Injury Severity and Causes of Death from Operation Iraqi Freedom and Operation Enduring Freedom: 2003–2004 Versus 2006," *Journal of Trauma and Acute Care Surgery* 64, no. 2 (February 2008), S21–S26; discussion S27.

[3] Robert L. Mabry and Robert A. De Lorenzo, "Improving Role I Battlefield Casualty Care from Point of Injury to Surgery," *Army Medical Department Journal* (April–June 2011), 87–91.

[4] Frank K. Butler, Jr., John Hagmann, and E. George Butler, "Tactical Combat Casualty Care in Special Operations," *Military Medicine* 161, no. 1, Supplement 1 (August 1996), 3–16.

[5] John B. Holcomb et al., "Understanding Combat Casualty Care Statistics," *Journal of Trauma and Acute Care Surgery* 60, no. 2 (February 2006), 397–401.

[6] Ibid.

[7] Eastridge et al.

[8] Brian J. Eastridge et al., "We Don't Know What We Don't Know: Prehospital Data in Combat Casualty Care," *Army Medical Department Journal* (April-June 2011), 11–14.

[9] Russ S. Kotwal et al., "Eliminating Preventable Death on the Battlefield," *Archives of Surgery* 146, no. 12 (August 2011), 1350–1358.

[10] Author correspondence with Dr. Elon Glassberg, Head of Trauma and Combat Casualty Care Branch, Israel Defense Forces, August 20, 2013.

[11] Robert L. Mabry et al., "Impact of Critical Care-trained Flight Paramedics on Casualty Survival during Helicopter Evacuation in the Current War in Afghanistan," *Journal of Trauma and Acute Care Surgery* 73, no. 2, Supplement 1 (August 2012), S32–S37.

[12] R.F. Bellamy, "The Causes of Death in Conventional Land Warfare: Implications for Combat Casualty Care Research," *Military Medicine* 149, no. 2 (February 1984), 55–62.

[13] Melony E. Sorbero et al., *Improving the Deployment of Army Health Care Professionals: An Evaluation of PROFIS* (Santa Monica, CA: RAND, 2013).

[14] Kotwal et al.

[15] Robert T. Gerhardt et al., "Out-of-Hospital Combat Casualty Care in the Current War in Iraq," *Annals of Emergency Medicine* 53, no. 2 (February 2009), 169–174.

[16] Mabry et al.

[17] Sorbero et al.

[18] Robert A. DeLorenzo, "Improving Combat Casualty Care and Field Medicine: Focus on the Military Medic," *Military Medicine* 162, no. 4 (1997), 268272.

[19] Robert A. DeLorenzo, "How Shall We Train?" *Military Medicine* 170, no. 10 (2005), 824–830.

Public health officers releasing *P. reticulata* fry into artificial lake in Lago Norte district of Brasília as part of a vector control effort (Fábio Rodrigues Pozzebom/Agência Brasil)

Mosquitoes
A Viable 21st-Century Soft Power Tool

By Mary Raum and Kathleen J. McDonald

Militaries and soft power have been interlinked since Alexander the Great began assisting the populations his armies conquered by rebuilding infrastructures and distributing food and first aid. Humane gestures by armies were considered important to winning loyalties. During the Napoleonic wars, military altruism had become customary enough to be included in soldiers' military science studies. Napoleon viewed humanitarian assistance as a form of philanthropy that helped change civil social order among those populations his troops defeated on the European continent. Over time, measures of humanitarian aid have shifted as the sizes, types, and durations of conflicts have changed. Military roles now involve functioning as relief agents, participating as surplus disposal entities for old or outdated materials and machines, acting as international peacekeeping forces or as liberators, and delivering organized and rapid natural disaster relief. The latest addition to these scenarios is the performance of long-term humanitarian roles in peaceful settings with nations that may have a future potential value as allies.[1]

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Frederick Cuny, a world-class humanitarian specialist who led many projects in the largest conflicts of the late 20th century until his forced disappearance in the Chechen war of 1995, believed the military had been drawn into five common humanitarian scenarios:

- undertaking rapid logistical-based relief deployment for natural disasters
- operating as martial law constituents at the conclusion of a conflict
- overseeing Phase Four reconstruction and peacekeeping efforts
- overseeing point relief for civilian populations between two warring parties
- acting as interventionists for civilian victims in conflict zones.

Each scenario requires a military to perform a diverse set of noncombat roles under fundamentally different mission models. Militaries are expected to be good at detached deployment, augmenting civil manpower, substituting for civilian workers, acting as police forces, and secondment (what the military calls individual augmentation of troop personnel). Nations go to militaries because they have at their disposal high-end communication equipment, a massive self-supporting manpower base, established organization due to a chain of command structure, and sophisticated command and control systems. According to Cuny, thinking of a military as both combatant and altruistic helper has evolved because of militaries' talents to perform as "cornucopias of assistance." Added to the five common roles within the cornucopia is a growing belief that the military should conduct aid operations permanently and on a long-term basis.

One of the least operationally antagonistic and organizationally disruptive ways for the U.S. military to serve as soft power agents on a long-term basis is through the Services' medical corps. Medical professionals act in dual roles as supporters and defenders of the Constitution against foreign and domestic enemies and as servants of the covenants of the Hippocratic oath. The oath obligates the taker to share scientific gains, look to disease prevention rather than cures, benefit the sick without reservation, respect the privacies of those being treated, tread lightly on matters of life and death, and remember that treating illnesses is the treatment of human beings and that the economic status of the ill should not drive choice of treatment. Each of these is to be remembered in light of the idea that medical professionals hold special obligations to society and as such should strive continually to seek the "true joy of healing others."[2] Current ideology in support of using medical soft power within military theaters of operation is that healthy populations are more secure populations, which in turn are more stable populations. Soft power medical programs expand access and influence and strengthen military and diplomatic relationships.

Globalization and Disease

Public health is more important than ever due to the global integration that is occurring as a result of rapid globalization, interrelated financial systems, and the ability of populations to afford travel. For all the positives of a borderless globe, a damaging consequence of this dynamic has been the ease with which diseases spread. The Severe Acute Respiratory Syndrome (SARS) outbreak of 2003 is a clear example. Beginning in China, the syndrome was brought into Canada by a passenger on a commercial airliner and then spread to other countries in North America, South America, Europe, and Asia before being contained. In 2009, an H1N1 influenza pandemic commonly known as Swine Flu, which had not appeared in society in equal magnitude since 1918, spread from the state of Veracruz, Mexico, to several continents, hitting North America when a 10-year-old patient in California was diagnosed with the disease. Eighteen thousand people were killed by the virus within 1 year. These events and others like them make public health programs a key consideration as a primary choice of military soft power projects.

Even graver in proportion than H1N1 and SARS is dengue fever, followed by Lyme disease, HIV/AIDS, human papilloma virus, and diabetes.[3] Of great concern is that in the last 25 years, unusual manifestations of dengue are appearing and showing cerebral symptoms, which are associated with the functioning of the central nervous system, and hepatic symptoms, which affect the liver.[4] There is no specific treatment for dengue, and there is no vaccine.

The U.S. military has had a long-term relationship with the ailment. During the Spanish-American War, the virus caused major illness among Servicemembers, and throughout history, high incidence of the disease occurred during operations in Somalia, Haiti, and the Philippines. In Asia and the South Pacific during World War II, the Korean War, and the Vietnam War, attack rates on troops were as high as 80 percent:[5]

It is probably soldiers who caused the original spread of dengue fever around Southeast Asia during World War II. . . . A Japanese scientist first isolated the virus during the war, and a United States Army physician, Albert Sabin, made the discovery that there were distinct virus types. . . . you had a movement of soldiers from England, the U.S., Australia and Japan. . . . soldiers flew from city to city. . . . In the 1900s, during the Philippine tour of duty, approximately 40% of newly arrived troops contracted dengue within one year.[6]

For over 100 years, the Army has documented and conducted research pertaining to numerous facets of the disease. Since the 1990s, the Services have been developing and testing possible vaccines in its medical research facilities in the United States and Thailand. This long-term study by military personnel from 1900 onward has resulted in extensive knowledge regarding how and why the disease spreads. Presently, at the Armed Forces Research Institute of Medical Sciences Bangkok, two experimental variations of vaccines are being studied in conjunction with the pharmaceutical company GlaxoSmithKlein and regional community health institutions.

What Is Dengue?

The World Health Organization (WHO) defines *dengue* as a mosquito-borne viral infection that causes a

flu-like illness and frequently develops into the potentially lethal complication of dengue hemorrhagic fever (DHF). Infected mosquitoes bite their victims primarily in the daytime, rarely travel more than 100 yards from their birthplace, and cannot survive freezing weather.[7] Occurring in four different forms, dengue is considered one of the most complicated viruses known today. Symptoms include high fevers; severe headaches; eye, muscle, and joint pain; rashes; and extreme nausea. In its severest forms, it causes internal bleeding and organ shutdown or impairment.[8] International deaths from dengue fever have at times ranked equally with those caused by yellow fever and have exceeded deaths from all other viral hemorrhagic fevers combined, including ebola, Marburg, Lassa, Korean, and Crimean-Congo.[9]

A 2014 WHO Global Alert and Response notification, which relays the severity of dengue, states that since 1964, the disease has increased 30-fold, that 2.5 billion people live in over 100 endemic countries where the virus can be transmitted, and that up to 50 million cases occur annually with its more extreme form, DHF, occurring in over half a million individuals, with death rates among children reaching 22,000 annually. Ninety percent of childhood deaths are patients under the age of 1 year. Current statistics, while staggering, constitute only estimates because accurate and timely reporting remains problematic. In addition, dengue fever (DF) and DHF are leading causes of hospitalization globally, accounting for 1,000,866 cases reported from 1991 to 2004, with the highest numbers in the Western Pacific.[10] A January 2008 issue of the *Journal of the American Medical Association* noted that global urbanization and increasing air travel are expected to make dengue fever a growing international health concern for the foreseeable future. The transmission profile of the disease is multifactorial due to the weakening of control measures in affected areas, rapid urbanization, unreliable water supplies, high population densities, and global warming. Due to international trading in plastic wastes and used tires, two important mosquito breeding grounds have emerged. These used materials serve as quality incubating habitats for larvae due to their structural qualities, which are highly conducive for housing water breeding pools for extended periods of time.

Asia-Pacific Region

In 1947, U.S. Pacific Command (USPACOM) was established to manage and direct forces that fought in the Pacific theater of World War II. Today, it covers approximately half the Earth's surface, from the U.S. West coast to western India and from the North Pole to Antarctica. As the largest of the six U.S. military geographic commands, it collectively represents one-fifth of America's total military strength. Six nations in the region—Australia, New Zealand, Japan, South Korea, the Philippines, and Thailand—are allied with the United States through mutual defense treaties, and key strategic relationships exist with Singapore, India, Taiwan, and Indonesia.[11] American Active-duty troops number 300,000 as part of 5 aircraft carrier strike groups; 2,000 aircraft; 2 Marine Expeditionary Forces; and 5 Stryker brigades.

The Asia-Pacific region, which is in the USPACOM area of responsibility (AOR), is being particularly hard hit by dengue. DF and DHF are upward trending in Southeast Asia overall with an attack rate in the range of 300–400 cases per 100,000 members of the population. Dengue attacks are the leading cause of hospitalization of children in Southeast Asia in general and within Vietnam in particular.[12] In Vietnam, cases are observed from the northeast to the Mekong River Delta all year round, with a slight peak in autumn. In a 2013 global health action report for Hanoi, the situation in Vietnam was called a "major threat," with the numbers of recent outbreaks generating significant international health authority concern.

Other upward trends are being experienced in Singapore and Thailand. Singapore had an outbreak in 2005, and in 2012–2013, reported cases rose from 4,632 to 10,257 in 12 months. Thailand experienced epidemics in 1987 and 1988, and 43,609 cases were reported resulting in 60 deaths in a 6-month timeframe in 2013. The Philippines reported one of the highest numbers of incidents in the region, and in the first 6 months of 2013, Malaysia reported over 10,000 cases. The Association of Southeast Asian Nations (ASEAN) news source, *The Diplomat*, reported that "because of changing climate patterns and the inevitable rise of mega cities, the dengue virus will continue to terrorize many tropical nations . . . . If left unchecked, it could lead to bigger outbreaks that governments may not be able to adequately handle."[13]

Vietnam in Context

In this vast and socially complex part of the globe, where 50 percent of the world's population resides, sits the Socialist Republic of Vietnam. It is an ancient country dating to the 2nd century BCE, having achieved its independence from China in 938 CE. Only 25 miles wide at its narrowest point, and with a coastline of 2,140 miles, it is bordered on the north by China, to the west by Laos and Cambodia, and to the east by the South China Sea. Since the 20th century, the nation has been impacted by French occupation, an overthrow by Japan, internal revolutions, an invasion by China resulting in a separation of peoples into northern and southern partitions, coups, and internal struggles with communist political movements such as the Pathet Lao.[14]

Contemporary American military connections began with the country in 1950 during the French Colonial Administration. Combat action began in 1960 when 100 U.S. Special Forces troops were sent in after 2 Americans were killed in a guerrilla strike east of Ho Chi Minh City. From 1963 until the U.S. withdrawal in 1973, over half a million ground, sea, and air force personnel were deployed for a variety of military actions. Twenty years after the Vietnam War, President Bill Clinton announced the normalization of diplomatic relations between the two countries. Several U.S. and Vietnam cross-nation agreements have

Medical task force from Australia helps manage dengue fever outbreak and treats patients at National Referral Hospital in Honiara, Solomon Islands (Courtesy AusAID)

occurred since the mid 1990s: an annual bilateral human rights dialogue, bilateral trade agreement, counternarcotics letter of agreement, civil aviation agreement, and approval of permanent normal trade relations. A Pew Research Center poll notes that 71 percent of Vietnamese people view Americans in a favorable light.[15]

American military medical aid is not uncommon within USPACOM. A recurring joint/combined humanitarian assistance mission, Operation *Pacific Angel*, has been ongoing since 2007. Other operations have involved setting up medical, dental, optometry, and women's health programs, performing children's surgical operations, repairing hospital equipment, and conducting civic action programs in the form of reconstruction of hospital facilities.[16] The United States Embassy in Hanoi describes Department of Defense (DOD) support for a variety of Overseas Humanitarian Disaster and Civic Aid funded projects. Sixteen thousand U.S. military personnel assisted during the 2004 natural disaster that affected 11 South Asian and Southeast Asian countries when nearly a half million people were displaced. Joint task forces for humanitarian assistance have helped Burma and the populations along its coast. Since the 1990s, the United States has aided victims of typhoons and floods and has conducted aid operations by participating in both ad hoc and multilateral assistance programs after several earthquakes, tsunamis, and cyclones. These assistance programs have been short-term interventions that are geared toward easing immediate suffering.

Though smaller in geographic size and military strength than other countries in Asia, Vietnam is growing in terms of military strategic importance. In part, this is due to the U.S. National Security Strategy's pivot to the east. A military buildup and modernization are taking place in the region, and East Asian countries in particular are upping their naval arms race, which is increasing the risk of military confrontations. The area's strategic economic importance and some of the rapidly expanding economies in the theater have the potential to inflate stress as these nations vie for scarce resources.[17] Regional development of seapower is of distinct interest with the introduction of China's first aircraft carrier in 2012 and Japan's helicopter carrier. In Vietnam, the government has introduced the first of six planned Russian *Kilo*-class submarines, adding it to the ranks of several South East Asian nations including Malaysia, Indonesia, and Singapore that have submarine capabilities.

Current Initiatives

With a population of 90 million people of 54 ethic nationalities, Vietnam is the

second largest country in Southeast Asia and the 13th most populous country in the world. In the densely forested highlands and tropical lowlands, dengue has spread to six of its eight regional provinces. In February 2013, Hanoi announced that there were 62,039 cases reported in the southern region alone, indicating an increase of 11.2 percent as compared to 2011.[18]

Diseases such as dengue become key factors in the ability to retain community stability because of major healthcare costs to populations in a nation with an average per capita income of approximately $4,000 per year. The economic burden is alarming, with the average cost for a patient in 2007 costing $167. More importantly, in terms of impact on family economics, 47.2 percent of families had to borrow money for treatment, and after 6 months, 71.7 percent had not begun or had only managed partial repayment. Approximately 72.9 percent of the infected population indicated that the cost of supporting a dengue fever patient had affected the family's ability to function normally, with an average monetary loss being 36 percent of the annual income in the lowest economic quartile.[19] In Pacific Asia, the disease goes uncared for because of financial distress.

In the past decade, several short-term military assistance programs based on logistics, training, and reconstruction efforts have taken place in Vietnam. Since 2006, eight U.S.-supported medical clinics have been built in Thua Thien-Hue Province in the center of the country. A DOD-backed medical clinic was constructed in 2006 in the Quang Ninh District of Quang Binh Province along the north central coast. Other programs included building a disabled children's center in Dong Hoi Town of the Quang Binh Province and a primary school and a secondary school in Gio Viet Commune on the north central coast. DOD has also made at least three donations of excess medical property valued at over $2 million. Recipients of the supplies were hospitals located in the former imperial capital city of Hue and the General Hospital at Can Tho, the fourth largest city in the nation, which is located in the extreme south central portion of the country. U.S. Navy medical personnel have joined with Vietnamese army doctors and nurses to conduct clinics and give medical education and training programs in patient care and surgical management. The U.S. Naval Research Medical Unit hosted a 2004 conference on developing an Early Warning Disease Outbreak Recognition System at Vietnam's Pasteur Institute. The institute, which has been in existence since 1891, conducts research in dengue fever, diarrheal disease, HIV, leprosy, and polio.[20]

Medicine and Soft Power

The Vietnamese DF situation is a formidable candidate as a trial case for creating a proactive military-backed public health improvement program. Reasons why this choice makes sense are numerous. Dengue is common in nations in the USPACOM AOR, and the command should be an imperative player in the current national security strategy of pivoting to Asia. The health and well-being of American troops in the region are a cause for concern, as is their potential candidacy, as global travelers, for spreading the disease. There are numerous U.S. military medical resources already in the region, and there is a history of medical exchange with the country. The geographic closeness of the country to China and Korea may result in a higher likelihood of having Chinese and Korean medical professionals available for a multinational pilot program. Vietnam is small enough geographically to be able to develop a dengue trial program for both rural and high population areas without expending exorbitant levels of resources. Allies such as Australia already have established dengue programs in Vietnam, making it possible to work with existing programmatic efforts, international networks, and facilities. The U.S. Army is nearby in Singapore working on a dengue vaccine. A formal Vietnamese national dengue control program exists, although it operates in a reactionary fashion to dengue outbreaks.

On a larger scale, developing a soft power program based on dengue makes sense because the disease is a health concern that exists across all U.S. combatant commands. Lessons learned from an official USPACOM incubator program would be transferrable to many other health engagement opportunities around the globe. Prevalence of the disease's existence globally, its effects on the health of the world, and the likelihood of dengue remaining a health threat for several more years make the incubator program of long-term interest and one that allows soft power relationships to be built with numerous countries at the same time. Developing a dengue program also supports one of the top six key Sphere Project standards, which assist in the mitigation of endemic disease and endemic disease rates.[21]

A Way Ahead

To determine how an incubator program could be built, it is useful to look at how the military currently approaches humanitarian aid. The most common approach used to promote medical soft power is the medical civic action program (MEDCAP). Such programs are routinely undertaken to enhance nation-building to indirectly influence or enhance theater security by promoting a caring face to nonmilitary populations. Most U.S. MEDCAPs are formed around the three themes of dental, medical, or veterinarian assistance. The Peacekeeping and Stability Operations Institute of the U.S. Army has noted some negative aspects of MEDCAPs: they can be "counterproductive and hamper long term capacity development, leading often to dependency on part of the host nation."[22]

Problems with current practices and procedures in implementing soft power medical programs are numerous. In a series of articles in the online repository of PubMed.gov, individuals who have been involved in humanitarian assistance programs for decades relate some of the issues they have faced. The largest concern is the lack of measures of effectiveness related to the reduction of disease burdens. Without metrics, programs are less likely to be of true use to

Commander of 1st Area Medical Laboratory mixes two dengue affected insects with dozens of healthy ones to determine if his scientists could analyze and deliver correct diagnosis (U.S. Army/Carol McClelland)

the host nation because no one will know how the soft power program benefited it. Other apprehensions are that, first, DOD does not have any formal evaluation system for its humanitarian aid projects. Second, due to the multiple roles military personnel are required to perform, solid coordination with private and volunteer organizations and host nation officials is less than effective. Third, there is no central repository of information for analysis of lessons learned. Since feedback is rare, projects of similar scope are reinvented each time they are undertaken. Fourth, DOD does not implement health sector humanitarian assistance impact assessments such as those existing within the humanitarian aid community.

Traditionally, the U.S. military uses a clinically based input-output management measurement model that does not emphasize outcomes or the why and how of program effectiveness. This results in a lack of understanding of which soft power medical programs have been effective. The input-output model system does not often document useful lessons learned among the host nation, the receiving nation, and partners from the international aid community. There is some consensus with humanitarian aid experts that the military focus should shift from instigating a short-term operational clinic environment toward thinking of medical aid as a larger category of public health improvement.

Relying on the normal clinical approach as the medical resolution model for disease assistance programs may not always be the most effective tool for international military healthcare agendas. This should not suggest that the clinical approach is not valuable, for it has numerous strengths such as its ability to focus on the physical and biological aspects of disease and conditions and its efficiencies in identifying, in person, defects and dysfunctions of disease using patient histories, physical examinations, and diagnostic testing. The clinical systems thinking model is based on the 19th- and 20th-century approach to rapid, centralized, short-term medical guidance that is inherent to field medicine mission sets, which should be primary to all military services because of their frontline associations with combat and the necessity for saving life under horrific circumstances. Training for war should continue to be a primary goal of military medicine. However, the increased use of militaries for humanitarian aid and pre- and post-reconstruction activities gives military medicine another set of problems to deal with. In these new circumstances, the tried and true clinical attitude so effective in war and conflict is too reactive for uncustomary mission sets categorized as health improvement programs.

Thinking of a health-improvement entity rather than a clinical-systems entity requires some modifications in medical delivery philosophy. To make the shift, one proposed dengue engagement model might be created using four key action areas developed by the U.S. Centers for Disease Control and Prevention over decades of experience in resolving national and international medical and health issues. To deliver a health improvement dengue program, four perspectives of importance should serve as a base for action: epidemiology and surveillance, understanding the environment, health systems intervention, and community-clinical linkages.

Epidemiology, the study of frequency and distribution of disease and surveillance, refers to knowing the location and content of existing global data and information banks as well as providing the right expertise for management and delivery. At a meeting in Manila in September 2013, WHO urged nations with endemic proportions of dengue fever to invest in chemical vector eradication on a year-round basis. Vector control methods to limit disease pathogens follow one of several strategies: controlling mosquito habitats, reducing human contact with mosquitoes, or chemical and biological controls using bacterial toxins or botanical compounds. WHO further stipulated that outbreak response and regulation begin with education of the population to recognize symptoms to seek treatment as early as possible in the disease cycle.[23]

Understanding the environment would mean comprehending and appreciating existing cultural behaviors toward disease as well as determining several issues: What are the available health access structures (such as clinics)? What are the level and content of available medical supplies? What geographic components such as water and sewer systems exist? What are the number and type of available in-country healthcare professionals? A variety of approaches currently exist in Asia to build communication channels from. An ASEAN Dengue Day was sponsored on June 15, 2013, to promote disease awareness. Singapore sponsored a 4-week campaign to eradicate mosquitoes in which more than one million jars of insecticide were delivered to households. In Thailand, the government proposed that its 77 provinces open dengue "war rooms" to keep families apprised of outbreaks. A Filipino campaign called the "4 o'clock habit" encouraged families to stop daily to look for dengue-related problem areas in their immediate surroundings. Malaysians established a Web portal showing updates as to where dengue outbreak case clusters are occurring.[24]

Health systems intervention relates to gathering information about and understanding the number, type, and location of prevention, detection, risk mitigation, and health management programs that exist not only within the country of operation but also elsewhere in other geographic commands. Joint international programs are also evolving. From 1995 to 2000, the Australian Foundation for the Peoples of the South Pacific, in collaboration with the Australian Government Overseas Aid Program, National Institute of Hygiene and Epidemiology, and Ministry of Health in Vietnam, undertook a 5-year project to reduce the incidence of dengue in target areas. The multilateral approach is fostering institutional capacity-building and sustainability through low-cost community-based educational programs.[25]

No matter the final form a dengue program might take, five common dilemmas inherent to soft power medical programs will need ongoing and thoughtful consideration. Military personnel will have to deal with conflicting social values of the host nation as well as conflicting perceptions of disease control methods and procedures. Military professionals will constantly need to regulate themselves to fit the nuances of a military's involvement in a noncombat role. They will also need to keep in mind that the mantle of neutrality in all instances is important to program success. This means keeping a broad understanding of multiple sides, keeping true to the concept of not helping for political gain, and not collaborating with political bodies. In the end, an incubator program such as the one that could be developed with Vietnam may result in developing a body of in-house expertise on programmatic components of effectual civilian disaster relief to be shared with all Service branches and all combatant commands. The Vietnam example is worth pursuing. A tiny mosquito could be the foundation for instigating a new soft power philosophy based on public health improvement rather than a MEDCAP mentality. **JFQ**

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Covering water to prevent dengue, Baguio, Philippines (Courtesy AusAID)

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Landing boats pouring southern landing force Soldiers and their equipment onto beach at Massacre Bay, Attu, Aleutian Islands (Library of Congress, Prints & Photographs Division, FSA/OWI Collection)

Operation *Cottage*

A Cautionary Tale of Assumption and Perceptual Bias

By Del C. Kostka

In the summer of 1943, American and Canadian forces launched an amphibious assault on the north Pacific island of Kiska. Codenamed *Cottage*, the operation was intended to seize the last enemy stronghold on North American soil from Japanese occupiers. The assault began in the predawn hours of August 15 with a heavy coastal barrage by an armada of nearly 100 Allied warships. Intense fire support was followed by a chaotic but successful ship-to-shore

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movement of over 34,000 U.S. Army and Canadian combat infantrymen. For 2 long days, the invasion force slugged its way inland through thick fog and against the constant din of machinegun and artillery fire. By the time the island was declared secure, over 300 Allied soldiers lay dead or seriously wounded. Japanese casualties? There were none. The Japanese had abandoned the island almost 3 weeks prior.

How could this have happened? How could a command staff of considerable talent and intellect disregard a plethora of intelligence and execute a major amphibious assault on a deserted island? The answer might lie in a basic construct of the human thought process known as perceptual bias. *Perceptual biases* are experienced-based assumptions and expectations that individuals intuitively apply to the world around them.[1] In his book *The Psychology of Intelligence Analysis*, Richard Heuer argues that all individuals assimilate and evaluate information through a personal mental model (or mindset) influenced by perceptual bias. Perceptual bias is not inherently bad. The assumptions we form through this bias allow us to process what would otherwise be an incomprehensible amount of information, but they can also set a lethal trap for unsuspecting mission planners, decisionmakers, and intelligence analysts.[2]

Assumptions are extremely relevant to operational planning. Joint Publication (JP) 5-0, *Joint Operation Planning Process* (JOPP), defines *assumption* as a supposition about the current situation or future course of events assumed to be true in the absence of facts.[3] Assumptions that address gaps in knowledge are critical for the planning process, but the planning staff must not become so wedded to their assumptions that they reject or overlook information that is not in accord with those expectations. This article examines perceptual bias and assumption in the historical context of Operation *Cottage*. The pointless assault of Kiska offers a valuable lesson on the dangers of unverified assumptions and the importance of cognitive analysis in contemporary joint operation planning.

Strategic Setting

Kiska is part of the Aleutian Archipelago, a chain of volcanic islands stretching from the Alaskan mainland to the far western edge of the Bering Sea. Barren, windswept, and shrouded in perpetual fog, the Aleutians embody some of the harshest weather and most desolate terrain on the North American continent. Despite this inhospitable environment, the Japanese were intensely interested in the Aleutians due to the unique geography. The islands form a natural corridor between the Eastern and Western hemispheres. By occupying key strategic locations along the Aleutians, the Japanese hoped to control and defend the northern perimeter of their expanding Pacific empire.[4]

The Japanese seized Kiska on June 7, 1942. The attack was part of a north Pacific diversion for the Midway campaign orchestrated by Admiral Isoroku Yamamoto, commander in chief of the Imperial Japanese Navy (IJN) Combined Fleet.[5] Yamamoto's plan included a carrier-based air assault of American naval facilities at Dutch Harbor, Alaska, and occupation of Kiska and Attu, the westernmost islands in the Aleutian chain. The Kiska occupation force consisted of approximately 7,800 marines of the IJN Special Naval Landing Forces under the command of Rear Admiral Monzo Akiyama. Over 500 civilian laborers were also brought to the island to construct harbor facilities on Kiska's natural deepwater bay and an elaborate system of caves and tunnels throughout the rocky high ground.[6]

Japanese possession of Kiska and Attu dealt a significant psychological blow to the American war effort. No enemy force had occupied North American territory since the War of 1812, and news of Japanese presence in the Aleutians threatened both the confidence and morale of the American public. Defense of the Aleutians was vested in the Alaska Defense Command (ADC), a skeletal force of 24,000 under the command of Major General Simon Bolivar Buckner, Jr. The command was a component of the Army's Western Defense Command, established in 1941 to coordinate defense of the entire Pacific Coast region. In response to the Japanese foray into the Aleutians, the Joint Chiefs of Staff began a rapid buildup of U.S. forces in the region. By the fall of 1942, ADC had swelled to over 94,000 personnel.[7]

Seapower in the region was represented by the U.S. Navy's North Pacific Task Force. Admiral Chester Nimitz, commander of the United States Pacific Fleet, established the North Pacific Force in May 1942 when Navy cryptographers first uncovered the Japanese plan to attack Midway and Dutch Harbor.[8] To command the North Pacific fleet, Nimitz selected Rear Admiral Robert A. Theobald, a 34-year veteran of naval surface warfare operations. Since Japanese naval operations were considered the principal threat in the Aleutians, the Navy was designated the Service of paramount interest by the Joint Chiefs. Therefore, Theobald, as commander of the North Pacific Fleet, was given command authority over all Army and Navy forces in the region.[9]

In sending Theobald to the Aleutians, Nimitz unwittingly touched off a powder keg. The cerebral and cautious Theobald stood in stark contrast to the impatient and action-oriented Buckner. The two quarreled incessantly about the timetable for offensive operations and the disposition of air assets in the region. Buckner also complained of Theobald's propensity to withhold intelligence from his Army counterparts, an assertion that Theobald justified based on his concern for operational security.[10] Nimitz was aware of the contentious relationship that developed between Theobald and Buckner and its potential to be detrimental to the joint operations needed to oust the Japanese from the Aleutians. In December 1942, Nimitz replaced his reticent joint force commander (JFC) with Rear Admiral Thomas C. Kinkaid, who had recently served with distinction at the Battle of the Coral Sea and was reputed to be the kind of aggressive and decisive leader Nimitz required in the North Pacific.[11]

Kinkaid's first major decision upon reaching the Aleutians was to establish an immediate naval blockade to wall off Kiska and Attu from Japanese shipping,

Part of huge U.S. fleet at anchor in Adak Harbor in Aleutians, ready to move against Kiska (NARA/U.S. Army Air Forces/Horace Bristol)

an act of aggression much appreciated by Buckner.[12] American B-24 bombers had already been assailing Kiska's harbor since September 1942. The sea blockade only added to Japan's logistical challenge of provisioning and sustaining its forces. By March 1943, the only supplies reaching Kiska and Attu on a consistent basis were those brought in by submarine.[13]

Of the two islands, Kiska was more significant from a strategic perspective. Kiska had a fully developed harbor, an operational airfield, and a substantially larger garrison. Despite Attu's secondary importance, Kinkaid and Buckner agreed to repatriate the far western island first. Attu was lightly defended, and seizing it first would put U.S. forces astride the Japanese line of communications and erect a further barrier to supply and reinforcement of Kiska.[14] On April 1, the Joint Chiefs approved Kinkaid's petition to assault Attu. The operation, designated *Landcrab*, was scheduled for May 10, 1943.

Lessons of Attu

Attu is approximately 35 miles long and 15 miles wide. Its snow-capped mountain peaks tower 3,000 feet above sea level. Steep, ice-covered slopes extend from the high ground down to a treeless plain of arctic tundra. The Japanese occupation force was comprised of a single Imperial Japanese Army infantry battalion under the command of Colonel Yasuyo Yamasaki.[15] The Japanese spent the majority of their time on Attu constructing an airfield along the northeast shore of the island.

Execution of *Landcrab* was assigned to the Army's 7th Division under the command of Major General Albert E. Brown. The American plan was to make simultaneous landings on the northern and easternmost shores of Attu, then push inland in perpendicular thrusts to trap the Japanese on the northeast corner of the island.[16] The plan appeared simple given the occupier's isolation and total lack of fire support, but the operation quickly ran into difficulties due to weather, the terrain, and a very shrewd Japanese defensive strategy.

American forces expected an intense coastal defense by the Japanese. What they found instead were abandoned

Soldiers hurling trench mortar shells over ridge into Japanese positions, Attu, Aleutian Islands (Library of Congress, Prints & Photographs Division, FSA/OWI Collection)

shores as the occupiers pulled back from the coast to await the invasion force in the higher rocky terrain.[17] The unopposed landing was welcome news to American troops already dealing with churning seas and 25-degree temperatures, but it did not bode well for an advance to the island interior, which now faced murderous mortar and machinegun fire from the higher ridges. The Japanese deployed their forces in small groups of sniper and mortar teams, which used the island's natural network of caves, crevices, and ridgelines for concealment and protection. Naval and artillery bombardment were ineffective due to the thick fog. The fog also provided an ideal backdrop for Japanese snipers who kept watch on the few accessible slopes to the upper elevations and cut down U.S. infantry as they appeared above the fog line.[18] Lack of positive news from the front coupled with Brown's continuous call for reinforcements convinced Kinkaid that Operation *Landcrab* was bogged down. After consulting with Buckner on May 16, Kinkaid replaced Brown with Major General Eugene M. Landrum.[19]

The Japanese tenaciously defended every ridge and stronghold on Attu, but the numbers and elements were against them. As fresh American troops and supplies flowed freely through the open beachhead, the Japanese continued to expend their resources in a futile battle of attrition. By May 28, the Japanese situation had grown critical. Food, ammunition, and medical supplies were scarce. In desperation, Yamasaki prepared a bold plan. He would use his entire force to break through the frontlines and capture an artillery battery and supply depot at the crest of a prominent hill in the American rear area. With artillery, supplies, and strategic high ground in Japanese hands, Yamasaki hoped to hold the position until reinforcements arrived by sea.[20] The audacious Japanese plan almost succeeded.

In the early morning hours of May 29, every Japanese soldier who was still able to walk set off on a silent trek toward the American frontlines. The Japanese quickly overpowered three sentry outposts and began a half-mile ascent toward the supply depot at the top of the hill. The position was practically undefended except for a battalion of U.S. Army combat engineers who somehow managed to beat back the attackers in a frenzied hand-to-hand melee.[21] The engineers pushed the exhausted Japanese back to the base of the hill. Several of the Japanese made their way back to the caves and crevices of the high ground where they were eventually cornered and eliminated by American search teams. Most simply clutched a hand grenade to their chest and scattered themselves across the Aleutian tundra.

As the fog lifted, the morning sun revealed a grisly sight. Over 500 Japanese bodies lay horribly mutilated on the valley floor. Several hundred more bodies, both American and Japanese, were littered across the crest and down the long slope of the hill.[22] The Japanese had virtually fought to the death. Only 29 wounded Japanese soldiers remained alive from the 2,650 that once inhabited the island. The American casualty rate was stunning. Of the approximately 16,000 troops engaged on Attu, the invasion force suffered 3,829 casualties, including 549 killed in action.[23] To Kinkaid and the Joint Chiefs, the bloody victory on Attu was an unimpeachable portent of things to come.[24]

On to Kiska

With Attu now under U.S. Army control, the Joint Chiefs directed their attention to Kiska. American intelligence estimated Japanese troop strength

on Kiska at approximately 10,000, and aerial reconnaissance thoroughly documented a labyrinth of hardened tunnels and bunkers throughout the high ground.[25] With Attu still fresh in his mind, Kinkaid, who had been promoted to vice admiral after *Landcrab*, was determined to allocate sufficient resources for the greater challenge of Kiska. Command of the attack force was vested in Rear Admiral Francis Rockwell, an amphibious operations specialist who had served as principal planner for the Attu invasion. Major General Charles Corlett was to command the landing force, an assemblage that ballooned to over 34,000 with the addition of the 5,300-strong 13th Royal Canadian Infantry Brigade.[26]

During the month of July, Eleventh Air Force dropped 424 tons of ordnance on Kiska, while an offshore screen of U.S. Navy cruisers and destroyers lobbed an additional 330 tons of shell onto the island.[27] Air reconnaissance operations were relentless, collecting intelligence on Kiska's occupiers at every opportunity allowed by the notorious Aleutian fog. As the assault preparations extended into August, the combined landing force began to assemble on Adak Island, 200 miles east of Kiska.

Starting in late July, however, air photo interpreters began to note curious observations. Routine activities on Kiska appeared to diminish significantly, and almost no movement could be detected within the harbor. Bomb-damaged buildings and craters on Kiska's airfield were left unrepaired, a suspicious breach of protocol for the industrious Japanese. Aircrews also reported greatly diminished antiaircraft fire. On July 28, radio signals from Kiska ceased entirely.[28] To many intelligence analysts, the mounting evidence suggested that the Japanese had somehow slipped through the Allied naval blockade and evacuated Kiska. Kinkaid did not agree. Influenced strongly by Japanese tactics on Attu, he argued that the enemy had simply taken to the upper elevations. Staff suggestions for further aerial reconnaissance and an advance scouting party were discounted as risky and unnecessary.[29] On July 30, Kinkaid requested and received final approval from Nimitz to execute Operation *Cottage*. D-day was set for August 15, H-hour at 0630.

The morning of August 15 was unusually calm and clear in the western Aleutians, but the brief respite from fog and gale force winds did not insulate the assault force from adversity. An inaccurate tidal forecast caused several tank landing ships to run aground the submerged web of volcanic rock off the Kiska beachhead. The stationary vessels triggered a traffic jam, as countless landing craft backed up and bobbed unproductively in the littoral.[30] The landing was unopposed as predicted, but to the infantry veterans who witnessed the carnage on Attu, the lack of contact with enemy forces simply meant that the Japanese were calmly waiting in prepared positions on higher ground.[31]

As the landing craft slowly wove their way onto the beach, a dense fog began to settle over the island, bringing with it a cold, steady rain. There was no shelter for the exposed landing force. The icy blanket of fog soon reduced visibility to near zero. As night fell, disoriented troops scratched shallow foxholes in the rocky tundra in which to await daylight and some semblance of order. Sleep was impossible. Sporadic firing could be heard in all directions, and the eerie glow of tracer bullets tearing through fog only added to the confusion. Voices trying to organize and coordinate were muffled and swept away by the wind.[32]

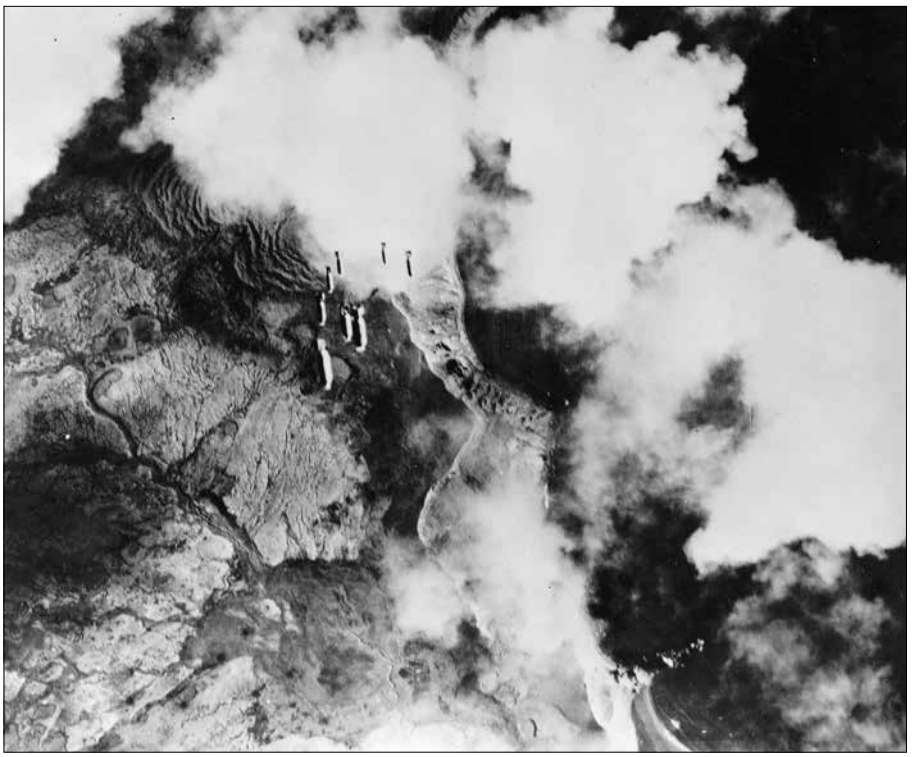
Daylight eased the tension, but the fog, rain, and cold wind remained. As the infantry began their climb into the high ground, artillery fire roared out of the mist behind them. Support fire from warships continued to whistle overhead and explode in the distance. Rumors of casualties, firefights, and elusive Japanese snipers circulated with abandon.[33] By mid-afternoon, advance elements of infantry began to reach the lower echelons of Japanese fortifications. Now, new reports of abandoned bunkers and caches of destroyed weapons seemed to contradict the earlier rumors. As more deserted tunnels and dugouts were explored, the embarrassing truth became evident. The combined invasion force had seized an uninhabited island.

The uneasy silence that settled across the island did not lure the infantry into a false sense of security. The rumors of casualties were true. Lives had been lost through friendly fire, vehicle accidents, land mines, and booby traps. On the morning of August 18, the Navy destroyer *Amner Read* struck a mine in Kiska harbor, killing 70 sailors and wounding 47. All told, the Allied forces suffered 92 fatalities during Operation *Cottage* with a further 221 wounded.[34]

Although the assault of a deserted island was an embarrassment, and Kinkaid was roundly criticized in the American media, the operation did pay dividends in ways not apparent to Kinkaid's detractors. Amphibious warfare techniques were refined after the Kiska landing, and Kinkaid's decision to bypass and isolate heavily defended Kiska by first seizing Attu set a strategic precedent for the successful island-hopping campaign of 1943–1945.[35] Moreover, Japan's foothold in the Aleutians was gone.

The final mysteries of Kiska were not solved until after the war when interrogation of Japanese officials exposed details of the Japanese strategic retreat. The interviews revealed that the brutal slugfest on Attu had made as deep an impression on the Japanese Imperial Command as it had on Kinkaid and the Joint Chiefs. The continued Allied naval blockade of Kiska, along with relentless bombing by the Eleventh Air Force, convinced the Japanese that a second Allied assault to repatriate Kiska was imminent.[36] The decision to evacuate the Kiska garrison was not taken lightly. Some voices within the Imperial High Command held that a withdrawal from Kiska would dishonor the dead of Attu and that the soldiers of Kiska should be left to fight to an honorable death as well.[37] But even the most aggressive Japanese commanders realized that Japan's hold on Kiska was pointless, and manpower was badly needed elsewhere in the Pacific. On May 19, the Imperial High Command reluctantly issued orders to abandon Kiska.[38]

The original Japanese plan was to gradually withdraw the Kiska garrison by



Bombs dropping in train from U.S. Army Air Force plane on Kiska, Aleutian Islands (Library of Congress, Prints & Photographs Division, FSA/OWI Collection)

submarine, but this scheme was aborted in late June after three submarines assigned to the operation were detected and sunk by Allied destroyers.[39] It was then decided to evacuate the force using surface vessels as transports, leaving only a small rear guard to destroy hard assets and plant booby traps. On the evening of July 28, a small task force of cruisers and destroyers slipped through the Allied naval blockade under the cover of fog and extracted over 5,000 Japanese troops in less than an hour.[40] The rear guard, which accounted for the sporadic antiaircraft fire in the days preceding the assault, was later evacuated by submarine. In the end, the Japanese evacuation of Kiska was a daring and brilliant success.

Analysis

Operation *Cottage* was based on two key assumptions: the Japanese occupied Kiska, and the Japanese would not retreat from Kiska. That the Allied staff might have had an unrealistic impression of Japanese resilience and fortitude in August 1943 is understandable given the context of prior events in the Pacific. The speed and ease with which the Japanese seized Malaya, Singapore, and the island of Luzon in the Philippines stunned the Allies. Japan's samurai heritage and code of ethics known as *bushido* fueled a stereotype of a warrior culture steeped in obedience, discipline, and staunch revulsion to surrender. The intensity and savagery of the fighting on Attu only served to reinforce this image. Even the intelligence—the suspicious absence of observable activity, the unrepaired bomb damage, and the lack of signals intelligence—could all be attributed to a cunning enemy who had taken to the hills to await battle in prepared fortifications.

Every operation begins with assumptions. A prime objective of mission analysis is to convert basic assumptions into known fact.[41] An assumption should never be accepted as fact based simply on perception or superficial evidence, and as Operation *Cottage* demonstrates, the logic behind invalid assumptions can sometimes be extremely compelling. Fortunately, contemporary operation planners have systematic doctrinal guidance to avoid the pitfalls of perceptual bias and distinguish assumption from fact. The JOPP is a structured decisionmaking tool used to examine mission objectives and plan operations. JOPP is supported by Joint Intelligence Preparation of the Operational Environment (JIPOE), an analytical process used to determine an adversary's strength, disposition, and potential courses of action (COAs). Both the JOPP and JIPOE instill structured analytical techniques to challenge assumptions, identify mindsets, and stimulate outside-the-box thinking.

One of the primary techniques employed throughout the JOPP is red team analysis. Red teams comprise trained experts from the command staff who independently review plans from a contrarian perspective in order to identify alternative hypotheses and challenge basic assumptions.[42] Often, the same evidence that supports an initial reflex assumption may be consistent with several different hypotheses. Red team analysis helps the planning staff validate its intuitive assumptions by asking why the assumption *must* be true, and whether the assumption will remain true under all conditions.[43] Assumptions that cannot be validated through mission and red team analysis are captured as an information requirement. The J2 has overall staff responsibility for consolidating information requirements nominated through the JOPP and for recommending to the commander their approval and relative priority.[44] If a key decision must be made based upon an assumption, the information needed to validate that assumption is designated a Commander's Critical Information Requirement.[45]

Contrarian assessment and cognitive analysis are important components of JIPOE as well. The primary purpose of JIPOE is to support the JFC decisionmaking and planning process by providing a holistic view of the operational environment and adversary.[46] JIPOE, which is codified in JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment*, consists of four basic steps: a description of the operational environment, description of the impact of the operational environment, evaluation of the adversary, and finally, determination of the adversary's

likely COAs. The JIPOE process provides situational awareness and assumptions regarding the operational environment and the adversary and lays the foundation for an intelligence collection strategy to resolve the unknown. Intelligence collection and analysis are continuous throughout the JIPOE process. When new intelligence confirms or repudiates an assumption, any decision that was based on that assumption must be reexamined for validity.[47]

Some assumptions are unavoidable. There will always be gaps in knowledge and information shortfalls, particularly in view of adversary denial and deception efforts. Contingency planning, no matter how thorough, will always include assumptions that cannot be resolved until the actual crisis unfolds. In these instances, the command staff should formulate reasonable assumptions based on historical context and the best information available. Mission planners must ensure that all assumptions are clearly identified and captured as a risk for the commander's consideration.[48]

Perceptions about the Japanese adversary on Kiska were deeply ingrained in Kinkaid and his command staff, but a reexamination of the assumptions leading to Operation *Cottage* illustrates how a thoroughly executed contrarian analysis might have revealed evidence to consider an evacuation of the island among the more likely COAs to be employed by the Japanese. The rapid string of victories that did so much to typecast Japanese tenacity in the early months of the war also showed a remarkable capacity for strategic planning and military pragmatism. This practicality was demonstrated just 6 months prior to Operation *Cottage* when the Japanese evacuated Guadalcanal rather than fight to the end against an overwhelming Allied invasion force. Just as the prior Japanese exodus from Guadalcanal supported a probable evacuation of Kiska, so too did the intelligence. But to the planners of Operation *Cottage*, the variety of intelligence collected on Kiska only served to confirm their firmly held beliefs. Had the key baseline assumptions of Japanese presence and resilience been called into doubt, the supporting intelligence might have been given more credence and directed events to a decidedly different outcome.

JOPP and JIPOE provide mission planners with a logical, structured framework to identify, analyze, and assess perceived contradictions in the operational environment. Without these cognitive analysis resources, commanders have little recourse but to execute plans based solely on supposed knowledge of adversary intentions, a scenario that aptly describes Operation *Cottage*. Disproportionally influenced by popular stereotypes and Japanese tactics on Attu, Allied decisionmakers misread and misunderstood Japanese intentions on Kiska, facilitating a needless loss of blood and treasure.

Epilogue

Two tense and nerve-shattering days after landing on the shores of Kiska, exhausted Allied soldiers pulled themselves out of water-filled foxholes and surveyed their desolate surroundings. Among the artifacts left behind by the retreating Japanese were one stray dog, several primitive booby traps, and thousands of propaganda leaflets that had been air dropped by U.S. Army Intelligence. The leaflets informed the Japanese that their situation was hopeless and urged the immediate surrender of Kiska.[49] It did not occur to Kinkaid and his senior staff that the propaganda's intended audience would actually heed the advice. JFQ

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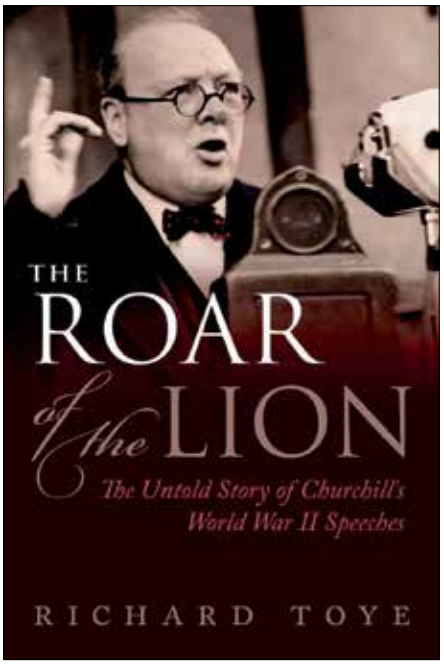

The Roar of the Lion: The Untold Story of Churchill's World War II Speeches

By Richard Toye
Oxford University Press, 2013
309 pp. $34.95
ISBN: 978-0199642526

Reviewed by Richard A. McConnell

> t was a nation and race dwelling all around the globe that had the lion heart. I had the luck to be called upon to give the roar."

The above passage is just one of many examples of superb oratory for which Winston Churchill is renowned during his wartime leadership of Britain. Richard Toye, a professor of modern history at the University of Exeter, examines how audiences received these now-famous speeches at the time of their delivery. Toye provides rich descriptions for readers to understand Churchill's speeches through the political and informational environment existing at the time. Using research from a wide variety of sources, ranging from Gallup polls to diaries, Toye examines audience perceptions recorded immediately following speech delivery. Remarkably, some of Churchill's most famous speeches were ill-received at the time while some of his lesser known speeches greatly influenced audiences. Toye explores an evolution of perception as contemporary audiences seemed to reinterpret over time some of Churchill's speeches, ascribing to them mythic qualities that they did not possess when delivered. He explores this phenomenon resulting in a literary time capsule, which expertly describes this war of words over the will of a nation. Military and civilian leaders alike can learn much from this comprehensive discussion of strategic communication.

The strategic environment in which Churchill operated was extremely complex and consisted of global stakeholders beyond the United Kingdom. Churchill was constantly engaged in balancing the need to bolster the fighting spirit of the British people with encouraging international partners. Some speeches created controversy at home because addressing Russian or American interests did not always play well in Britain or vice versa. Among many controversies were priorities of effort for the Allies. On one hand, ending the war in Europe before the war in the Pacific was important to many parties. On the other hand, American, Australian, and Chinese audiences could not perceive that Britain was uncommitted to the war in the Pacific. This message was difficult to communicate effectively, and Churchill did not always succeed at it. Toye provides detailed descriptions of the political realities that Churchill had to consider in his speeches along with the process he used to create them. Churchill dictated his speeches and then painstakingly vetted them through multiple parties prior to delivery. Toye's description of this process would be informative to anyone preparing for command media engagements.

One of the most compelling discussions in this book for military leaders is Toye's description of how Churchill addressed crisis management. Churchill was adept at addressing a bad situation with "brutal frankness" without destroying the morale of people engaged in a long war. A good example of this skill is the description of how Churchill reacted the week after D-Day, when V1 bombs began striking London with deadly effects. Some leaders might have been tempted to downplay the attacks and thus potentially offend the people directly affected. Instead, Churchill presented the facts in such a way that, across Britain, empathy increased for London, spreading national unity and renewed resolve—a great example of being first with the truth.

The Roar of the Lion compellingly describes one of the most gifted orators of the last century. Churchill's speeches serve as an outstanding model because they reflect a process of evaluating environmental challenges and finding the words to motivate a society to meet those challenges. These speeches were monumental, but they were also imperfect human utterances. Toye helps readers see those speeches as they really were. It would be difficult to find a better book for the discussion of strategic communication. Commanders at all levels can find themselves involved in various forms of public engagement. This book describes not only the arguments but also how Churchill meticulously crafted them. Toye's work would also be an ideal study resource for readers engaged in information operations, or public affairs, or for anyone who would like to learn about effective communication executed by a true master. **JFQ**

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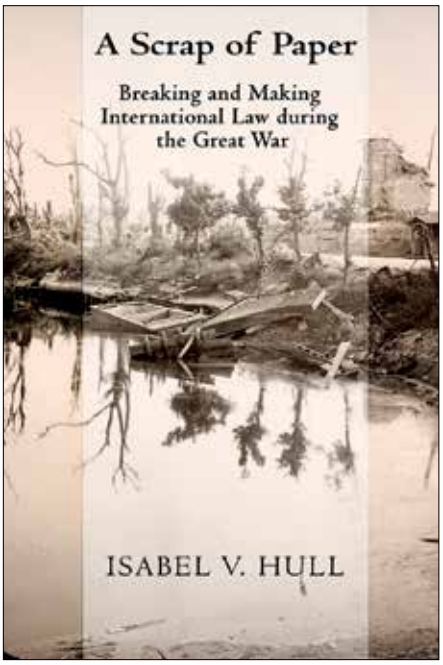

A Scrap of Paper: Breaking and Making International Law during the Great War

By Isabel V. Hull
Cornell University Press, 2014
368 pp. $45
ISBN: 978-0801452734

Reviewed by Nicholas Rostow

This centenary of the beginning of World War I has spawned divergent reconsiderations of the war. Why should these different views and the Great War itself be of interest to readers of *Joint Force Quarterly*? The reasons concern everything from the nature of peace to military operations and innovation. World War I has had such a profound impact on the structure of our world that it has even made the subject of human misery an area of enduring interest. Nationally, of course, the war represents America's entrance onto the world stage, followed by a short, costly effort to retreat, followed by the continuing leading role since 1945 or, perhaps more accurately, since December 7, 1941.

Isabel V. Hull, author of *A Scrap of Paper*, is a learned historian of Germany and Europe, particularly German history before and during World War I. Her scholarship merits the attention of *JFQ* readers because Americans and their partners who are engaged in armed conflict deal with its central themes every day: relations between civilians and military in the development and implementation of war plans; the conduct of war; the meaning of military necessity, content, relevancy, and role of international law in politico-military decisionmaking; and the different perspectives of governments and cultures.

Hull became interested in the role of international law in decisionmaking before and during World War I as a result of research on the German and other European conceptions of "military necessity" and her belief that the United States had wandered off the legal rails after the terrorist attacks of September 11. Hull begins with a simple statement from which so much else flowed: "The First World War began with an international crime: Germany's violation of Belgium neutrality" (p. 16). In exchange for accepting and recognizing Belgium's independence in 1839, the great powers of the day—Austria, Britain, France, Prussia, and Russia—guaranteed Belgium's perpetual neutrality (p. 17). Germany's war plan, first developed after 1890 and then refined most famously as the Schlieffen Plan memorialized in 1905, addressed the problem of possible simultaneous wars with France and Russia by a preemptive march through Belgium to knock France out of the war. The violation of Belgian neutrality was a catalytic event, turning the war into an unforeseen global conflict among behemoths. From the outset of World War I, Berlin justified this violation of international law on the ground of "military necessity."

Germany's conception of military necessity and the role and importance of law, and international law in particular, differed from majority opinion in Europe and America. This perspective provides the central theme for Hull's book. Her conclusion is that Germany's approach to law and order meant that the Great War had to be fought and won. Not necessarily the way it was fought and ended, but Germany had to be stopped lest German views of world order prevail. Hull puts it starkly and uses her deep research in primary and secondary materials in many languages to support her conclusion. "Denigrating the importance of Belgian neutrality," she writes, "appeals particularly to those who believe that Britain should never have entered the war, or indeed that the war should never have been fought; the basis for this view is the belief that Imperial Germany was not a danger either to Britain's security or to Europe's. Significantly, specialists in German history do not generally share these views" (p. 33). For the German military and most civilian leadership including the Kaiser, "military necessity *was* the law of war. The grand goal of war [is] conquering the enemy's energy . . . and will. This *single* goal rules absolutely, it dictates law and regulation. The concrete form of this law appears as military necessity" (p. 69). The more common and at the time majority view outside German military and political circles was expressed by Francis Lieber during the American Civil War in his justly celebrated Instructions for the Government of Armies of the United States in the Field, General Orders No. 100, dated April 24, 1863, which became the touchstone for subsequent understanding and development of the laws of war: "Military necessity . . . consists in the necessity of those measures which are indispensable for securing the ends of the war, and which are lawful according to the modern law and usages of war" (p. 67). In short, Germany superseded law in the name of military operations. At the same time, the law defined both the aims of military operations and the nature of such operations. These different conceptions put Germany at odds with international law and order. Hull uses the contrasting approaches of Britain and France to issues of international law and the exigencies of war to drive the point home.

Some British and French leaders considered Germany to be "simply lawless" (p. 210). Germany was not lawless, but the German military and political leadership understood law in a different way from their British, French, and, ultimately, American counterparts (a subject

for additional research is Austrian, Italian, Ottoman, and Russian views on the subject) and did not consider it to be important, per se. From the first days of the war, German action triggered this kind of response and, indeed, British and French formal inquiries into Germany conduct. Germany's response to Belgium's refusal to stand aside was draconian—executions, arson, hostage-taking, use of human shields, killing of unarmed prisoners, and pillage (for example, 850 civilians were shot between August 5 and 8, 1914). These events highlighted the lack of civilian control of the military in Germany. Atrocities happened with embarrassing frequency to reinforce growing information warfare (propaganda) vilifying Germany—for example, the execution of nurse Edith Cavell for helping Allied soldiers and civilians escape to Holland, the execution of the captain of an unarmed British steamer for evading a U-boat (based on an alleged ramming), the burning of the Louvain University library of hundreds of thousands of medieval books and manuscripts (to "teach them to respect Germany and to think twice before they resist her" (p. 53), the calamities of unrestricted submarine warfare such as the sinking of the RMS *Lusitania*, the use of poison gas, the use of incendiary weapons, and the bombing of cities such as London. As early as 1915, the German military even sent covert agents to the United States armed with anthrax and glanders (a disease that affects livestock) to infect horses and draft animals bound for the Allies. This effort led to the establishment of a laboratory for biological agents for sabotage.

Each of these events involved assessments of the existing law of armed conflict, whether pertaining to occupation and the treatment of civilians or the war at sea and the treatment of merchant shipping, neutral or not. The German approach to legal issues in this context differed markedly from the British and French. For the British the most important test involved the blockade: what was required by the technology of war at the beginning of the 20th century, whether starving an opponent was lawful or even worthwhile, and related questions about close and continuous blockade as well as the rights and obligations of neutrals. The British interdepartmental cabinet system ensured that civilian and legal views were continuously part of the decisionmaking process. French decisionmaking also coordinated civilian and legal views, particularly where potentially explosive issues such as reprisals for bombing of towns were involved. German decisionmaking followed different patterns. The Germans used poison gas for the first time without leaving behind a paper trail to illuminate the decisionmaking process, unlike in the case of unrestricted submarine warfare, meaning sink without warning. *A Scrap of Paper* principally compares British and German (and here and there French, Austrian, Russian, and American) approaches to the problems presented by the nature of World War I, the rules of international law, and the evolution of warfighting and international law during the conflict. The result is a cautionary tale for the contemporary policymaker and warfighter.

A Scrap of Paper is an illuminating study in relations between civilian and military establishments and the terrible impact of self-regard and hubris. The book is deeply learned (the author appears to have taught herself much international law), well written, arrestingly original, and accessible to the ordinary reader. It is recommended for serious students of international relations and strategy. It reminds us forcibly both that Clemenceau, France's World War I prime minister, had it right when he stated that war was too serious a business to be left to generals alone and that military necessity and military convenience are not synonymous. **JFQ**

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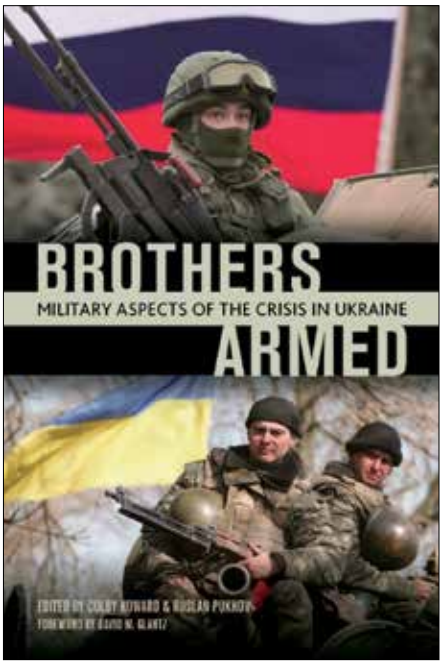

Brothers Armed: Military Aspects of the Crisis in Ukraine

Edited by Colby Howard and Ruslan Pukhov
East View Press, 2014
236 pp. $89.95
ISBN: 978-1879944220

Reviewed by Michael Kofman

Brothers Armed is an edited anthology comprising several essays detailing the history of Crimea, the post-Soviet history of the Russian and Ukrainian armed forces, and a detailed account of Russia's annexation of Crimea in March 2014. This volume is timely, especially given the dearth of existing scholarly sources on some of the subjects covered. It provides great insights into the annexation, comprehensively analyzes the historical context as well as the existing military balance, and delivers a full accounting in an objective and dispassionate manner.

The first chapter by Vasiliy Kashin briefly covers the history of Crimea until its controversial transfer from Russia to Ukraine in 1954 by Nikita Khrushchev. A change of borders intended mostly for pragmatic reasons, the transfer proved unpopular with Russians and became

a lasting problem between the two successor countries when Boris Yeltsin pushed for a hasty dissolution of the Soviet Union. Kashin explains that "the Crimean issue was never completely forgotten, but it was seen as relatively unimportant" as long as Moscow sought to achieve other goals in Ukraine, sacrificing Crimea in an effort to "draw the whole of Ukraine into its orbit." An added insight is that Russia made little official effort to retain its influence in Crimea during the 1990s, or stir up trouble there, but a personal crusade by Moscow mayor Yuri Luzhkov deserves most of the credit for preserving Russian influence on the peninsula.

Sergey Denisentsev next describes the Ukraine's military inheritance from the Soviet Union. Ukraine received "the second most powerful armed forces in Europe after Russia, and the fourth most powerful in the world." He describes the degradation of a formidable force, left without a budget, purpose, or political support as "completely unprecedented in terms of its speed and scale." The chapter assesses some roughly $89 billion of inherited military assets ($150 billion adjusted for inflation), detailing some of the Soviet Union's best technical assets.

Anton Lavrov and Aleksey Nikolsky then discuss why Ukraine largely neglected its armed forces, letting them deteriorate. Ukraine drastically cut manpower but maintained the Soviet mobilization-centric configuration and large stockpiles of equipment that were costly to maintain but provided little capability. Interestingly, the forces were all stationed on the western front because of existing Soviet infrastructure, and no funding was ever allocated to rebase units in the eastern half of the country. The reforms that did occur were pushed through by a pro-Western government in Kiev, starting in 2005, because of its desire to join the North Atlantic Treaty Organization (NATO). Ukraine's parliament, however, consistently underfunded the defense budget, undermining any attempts at reform, training, or modernization.

Russia's war with Georgia had an unexpected suppressive effect, suspending Ukraine's hopes of joining NATO and thus nullifying any impetus for further military reforms. A disastrous scheme by the government in 2009 to fund a large percentage of the defense budget by selling surplus equipment fell through, leaving the armed forces bankrupt and without food or electricity. As a cumulative consequence, by 2012 "some 92% of Ukraine's hardware was at least 20 years old, and 52% was older than 25 years." Lavrov and Nikolsky paint a clear picture of how and why Ukraine ended up having barely 5,000 combat-ready troops in 2014, as well as few flying aircraft and hardly any functioning ships.

Mikhail Barabanov follows up with two excellent chapters on Russia's own efforts at military reform. First came a series of fruitless attempts by defense ministers prior to 2008, when Russia fought two wars in Chechnya by creating ad hoc task forces and seeking to create a small combat force within a large mass mobilization army composed of skeleton units. The country was unable to "support or execute either." Russia's units sent untrained soldiers into Chechnya, sapping overall strength to field individual units, which combined into ineffective task forces.

This pattern changed when Vladimir Putin appointed Anatoliy Serdyukov as minister of defense to execute a radical transformation. The goal was to abandon mass mobilization in favor of an army that was consolidated, fully manned, employed a brigade structure, and intended for conflicts on Russia's periphery instead of a major war with NATO. The process described is fitful, consolidating and transforming the military but throwing it into turmoil. Some of the essential reforms were ultimately discarded or partially rescinded by Sergei Shoigu, the current minister of defense. By 2014, Russia had a radically more capable and combat-ready force to deal with Ukraine than it did in the Russian-Georgian war, but many of its fundamental problems, such as undermanned formations and dependence on short-term conscription, remain unresolved.

Aleksey Nikolsky details the formation of Russia's new special operations forces in 2011; these forces were designed for independent operations as Western analogues, leading to their eventual debut in the annexation of Crimea in 2014. Dmitry Boltenikov navigates the military and political status of the Black Sea Fleet, both the force itself and its political relevance, from Ukraine's independence to the present. This history segues into an intricate account of Russia's operation to annex Crimea, where Moscow took advantage of several unique factors, including its naval base, local concern and trepidation at events in Kiev, political missteps by the interim national authority, and an early tactical advantage.

A disguised insertion of special operations forces, supported by local marines already garrisoned, rapidly isolated and nullified Ukraine's forces throughout Crimea, which were numerically superior and retained much heavier firepower. Reinforcements via airlift and sealift established complete control, while proximity to mainland Russia allowed for heavier gear to arrive. With some exceptions, the affair was bloodless and surprisingly civil, concluding with the majority of Ukrainian troops joining Russia in the end. It is a remarkable account of tactical success, and a testament to select improvements within the Russian armed forces, but qualified by unique factors that make it almost impossible to repeat elsewhere.

The book concludes with Vyacheslav Tseluyko's chapter on how to reform and modernize Ukraine's force with an eye to further conventional conflict with Russia. He proposes a defense mindset, repairing existing systems and relying on standoff artillery, along with hopes for high-tech Western military assistance. It provides great background and ideas, though the scenarios discussed in Ukraine's Donbass region are dated given current events on the ground.

As a whole, this volume is an excellent compendium for experts on Russia's and Ukraine's militaries, but is equally accessible to newcomers, offering background, context, and insights on the annexation of Crimea. **JFQ**

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During exercise Stellar Avenger, *Aegis*-class destroyer USS *Hopper* launches Standard Missile–3 Blk IA, successfully intercepting subscale short-range ballistic missile, launched from Kauai Test Facility, Pacific Missile Range Facility, Barking Sans, Kauai (U.S. Navy)

Seeing 2020

America's New Vision for Integrated Air and Missile Defense

By Geoffrey F. Weiss

On December 5, 2013, with the stroke of a pen, Chairman of the Joint Chiefs of Staff General Martin E. Dempsey profoundly altered the U.S. approach to the pressing problem of air and missile defense. On that date—coincidentally, 70 years to the day after the U.S. Army Air Corps began Operation *Crossbow*, the Anglo-American bombing campaign against Adolf Hitler's V-1 and V-2 missile forces and a missile defense milestone—General Dempsey signed the *Joint Integrated Air and Missile Defense: Vision 2020*.[1] This seminal document for air and missile defense (AMD) outlines the Chairman's guidance to the joint force and, by extension, to all the stakeholders that contribute to the air and missile defense of the U.S. homeland and its regional forces, partners, and allies. What makes the new vision both exceptionally timely and highly relevant is that it accounts for the volatility and reality of 21st-century strategic and threat environments characterized more often than not by rapid, enigmatic change.

Colonel Geoffrey F. Weiss, USAF, is the Deputy Director of the Joint Integrated Air and Missile Defense Organization.

By crafting a holistic integrated air and missile defense (IAMD) vision—that is, one that encompasses a full range of integrated means including passive, nonkinetic, and left-of-launch—the Chairman has definitively departed from the previous paradigm that addressed an era of fewer, less capable threats. No longer can the United States reasonably expect to unilaterally defeat most air and missile threats with its own active defense systems or to outpace growing threat capabilities by outspending all of its potential adversaries. Instead, the new vision directs the joint force to embrace a broad spectrum of cost-informed options that enable greater IAMD adaptability and create flexibility to meet the challenges presented by proliferating air and missile threats across the global battlespace. The core of the Chairman's intent for IAMD is encapsulated in six key imperatives designed to guide the joint force in meeting these challenges in a logical and fiscally responsible manner. These include recognizing the need to leverage all forms of information to support IAMD detection, targeting, and engagement; enacting baseline joint and combined force employment to tap cooperative synergies; targeting IAMD system improvements to meet specific needs while ensuring affordability and interoperability; incorporating passive defense efforts to close seams and coordinate with other elements of IAMD; ensuring policies leverage partner contributions and burden-sharing; and fostering awareness across the Department of Defense (and beyond) of the benefits and proper use of the IAMD mission.[2] Clearly, these discerning directives to the joint force stand on their own; nevertheless, their significance and applicability are best understood by taking a closer look at IAMD and the factors and reasoning that gave birth to them.

A Brief History of Air and Missile Defense

Joint Publication 1-02 defines *IAMD* as "the integration of capabilities and overlapping operations to defend the Homeland and United States national interests, protect the Joint Force, and enable freedom of action by negating an adversary's ability to create adverse effects from their air and missile capabilities."[3] This is just a formalized way of saying AMD helps to win wars by defeating or mitigating enemy air and missile attacks. The origins of AMD can be traced back to the headwaters of war itself and the need to defend against ranged weapons. Throughout the history of warfare, there have been numerous so-called revolutions in military affairs, yet perhaps none as profound as the invention of ranged weapons, of which modern air and missile threats are currently the ultimate expression. Early ranged weapons, such as the bow and arrow, transformed war from a personal and highly risky affair to a less intimate one, enabling warriors to strike from safer distances that reduced the risk of immediate counterattack and the psychological consequences of face-to-face killing—an activity most people, even in ancient times, found abhorrent.[4] These weapons presented a new danger that compelled a Newtonian reaction to stave off a Darwinian fate—adapt or die. Early humans adapted by fashioning primitive defenses, which at the time consisted exclusively of passive measures such as shields or armor to survive an attack and movement, camouflage, concealment, and deception (CCD) to avoid an attack by confounding detection and targeting.

Over time, as the art and science of war and its weapons matured, the development of improved propulsion, guidance, and payloads in guns, artillery, rockets, mortars, aircraft, and missiles upped the ante, placing ever greater pressure on defenses to keep up in a high-stakes game of cat and mouse. The first use of a powered missile in war dates back to 13th-century China, but it was not until the early 19th century in Europe that these rockets gained the range and power to be of true military significance. The German V-2 missile holds the distinction of being the first true military *ballistic* missile.[5]

As the offense pursued weapons with greater speed, range, accuracy, stealth, and firepower, the defense, at least for most of war's history, has had a more limited menu of options. Of course, the first requisite element of any defense against air and missile threats is detection, tracking, and target discrimination. The target in question might be the aircraft, missile, its point or system of origin, or its guidance or command element. This part of the missile defense calculus began with human spotters, who have since evolved into expensive, technologically sophisticated land-, air-, and space-based sensors such as electronically scanned radars and infrared detectors. After the threat is detected, subsequent defensive options include movement and CCD (avoid the attack); shields, armor, or fortifications (survive the attack); and destroying or deterring the attacker (prevent the attack). With respect to countering aircraft, the theories of Generals Billy Mitchell and Giulio Douhet notwithstanding, a range of active measures, including surface-based and airborne guns, artillery, and missiles, has proved effective. However, ballistic missiles present a more daunting challenge because their speed and operating envelope make them nearly impossible to detect, track, and successfully engage. This is the problem often referred to as "hitting a bullet with a bullet."

Not until the mid-20th century did technology finally support a fourth option to address missiles—interception of the missile (neutralize the attack). This new, technology-assisted alternative ushered in the era of "active" missile defense—missiles could now kill missiles. Indeed, so much attention has been given to this new capability that the terms *active missile defense* and *missile defense* have become nearly synonymous. In 1996, the United States incorporated history's AMD lessons and added command and control to tie it all together within a doctrinal concept known as the "four pillars" of IAMD: passive defense (survive the attack), active defense (neutralize the attack), command, control, computers, communications, and intelligence (C4I) (detect and respond to the attack), and attack operations (prevent the attack).[6] Though no longer formally part of doctrine, the four pillars concept is still valid and useful for understanding the fundamental elements of AMD.

In the United States, modern active AMD programs began about the same time that long-range air and missile threats emerged. Defense against aircraft gained serious attention with the advent of combat aircraft in World War I and mainly relied upon other aircraft, antiaircraft artillery (AAA), and surface-to-air missiles (SAM), a paradigm that endures to this day. In countries with fewer resources, greater dependence is placed on AAA and SAMs, which are less costly to develop, man, and employ than manned aircraft. In this regard, missiles are something of a "poor man's air force," a fact that accounts for their proliferation throughout the world today.

U.S. ballistic missile defense efforts originated in response to the Nazi V-2 rocket program in World War II. Interestingly, the threat posed by Nazi missiles to the U.S. homeland was more significant than is usually recognized; the Germans actually had plans to attack the U.S. mainland with submarine-borne V-2s and had intercontinental ballistic missiles (ICBMs) on the drawing board.[7] After World War II, adversary air and missile threats, particularly from the Warsaw Pact countries, became more numerous and capable, and the United States began developing countermeasures in earnest. Direct threats to the homeland were limited initially to long-range aviation but later expanded to include ICBMs, submarine-launched ballistic missiles, and cruise missiles. Overseas, America's forward forces, partners, and allies faced a full range of threats to include short- and intermediate-range ballistic missiles, bombers, and tactical weapons such as artillery, rockets, and mortars. To address these threats, the Army and Air Force shared the initial burden of developing missile defenses. They tackled the thorny technical problem of creating viable active missile defenses for both the homeland and regional areas of responsibility. Early Air Force programs included Projects Wizard and Thumper in 1946 followed by the Army's Patriot in 1949.[8]

By 1958, the dire threat from Soviet nuclear-armed ICBMs coupled with unproductive inter-Service squabbling over missile defense responsibilities led Secretary of Defense Neil McElroy to assign the task of active strategic defense solely to the Army and to establish the Advanced Research Projects Agency to explore innovative solutions to aid the effort.[9] Against the strategic backdrop of the Cuban missile crisis, the Army wasted little time in getting to work on new systems designed to intercept Soviet missiles. Examples included the Nike Zeus and Nike-X anti-ballistic missiles (ABMs), which used nuclear warheads to destroy incoming missiles (a practice the Soviets also explored) in their terminal phase of flight. Yet despite some successful tests, the Nike programs were never fully implemented due to the risks of nuclear detonations over the United States as well as technical challenges in computing, detection, and target discrimination. The failure of Nike did not deter the Army or the other Services from continuing to explore and debate active missile defense concepts right up until President Richard Nixon signed the Anti-Ballistic Missile Treaty with the Soviet Union in 1972. The ABM Treaty imposed limits on the number of ABM sites and interceptors each country could field, essentially rendering strategic missile defenses on both sides militarily ineffective due to the overwhelming advantages in numbers and capabilities enjoyed by the country using ICBMs offensively.[10]

Even so, the ABM Treaty did not induce the United States to abandon its quest for a viable defense against missile attack. Throughout the 1980s and 1990s, the United States created a series of organizations assigned to collaborate with the Services and private industry to develop concepts for directed energy and nonnuclear, hit-to-kill missile interceptors. These organizations included the Defense Advanced Research Projects Agency; President Ronald Reagan's Strategic Defense Initiative Organization (1984–1994); the Ballistic Missile Defense Organization (1994–2002); and today's Missile Defense Agency (MDA, 2002–present).[11] Some of their novel initiatives explored methods for interception in all phases (boost, mid-course, and terminal) of ballistic missile trajectories by means of a variety of air-, sea-, and space-launched weapons integrated with advanced sensors and C4I. Ultimately, America's efforts and investments in pursuit of practical active missile defense were vindicated when, in 1991 during Operation *Desert Storm*, the Army's Patriot interceptors became the first missile defense system to successfully engage a missile in real-world combat by destroying an Iraqi Scud mid-flight.[12]

Seeking to capitalize upon the proven success of Patriot and the end of the Cold War, President Bill Clinton directed greater attention to the problem of theater missile defense (TMD). It was during his tenure that many of today's most well-known active TMD systems matured, including Patriot Advanced Capability-3, Terminal High Altitude Area Defense (THAAD), and the Navy's Aegis-enabled Standard Missile-3 (SM-3).[13] As part of this initiative to improve integration of theater AMD, in 1997, the Secretary of Defense and Chairman of the Joint Chiefs of Staff established the Joint Theater Air and Missile Defense Organization (JTAMDO) as a Chairman's Controlled Activity reporting through the Joint Staff Director of Force Structure, Resources, and Assessment (J8). JTAMDO's initial charter was to work with all the Department of Defense (DOD) AMD stakeholders, especially the geographic combatant commands, to define requirements, architectures, and capabilities for joint force theater AMD.[14] Later, JTAMDO's role expanded to include leadership in the integration of *all* AMD requirements, capabilities, and architectures, a nod to its repository of IAMD expertise, its success in capabilities analysis and war-gaming, and its unique position within the Joint Capabilities Integration and Development System (JCIDS) process. Thus, JTAMDO became JIAMDO with *integrated* replacing the word *theater*. Today, JIAMDO remains the Chairman's lead agency for implementing the *Joint IAMD Vision 2020*, advocating for affordable solutions to warfighter IAMD requirements and integrating AMD equities among a diverse range of stakeholders, each with its own organizational culture and priorities.

U.S. Marines with Amphibious Assault Vehicle Platoon, Battalion Landing Team 3/2, 26th MEU, Marine Air-Ground Task Force prepare to splash at Arta Beach (DOD/Michael S. Lockett)

The final phase of U.S. AMD history began at the end of President Clinton's second term. Having reinvigorated TMD, the President and Congress collaborated on the National Missile Defense Act of 1999, which made it "the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate)."[15] This law paved the way for President George W. Bush to withdraw from the ABM Treaty in 2002 and pursue a national missile defense designed to negate a limited ballistic missile strike on the United States. That vision became a reality with the implementation of a ground-based midcourse defense system with ground-based interceptors (GBIs) in Alaska and California. Today's IAMD systems, due to the complementary efforts of DOD, the Services, MDA, combatant commands, private industry, and JIAMDO, consist of an array of advanced, strategically positioned radar and infrared sensors, layered active missile interceptors—such as Patriot, THAAD, SM-3, and GBI—and robust C4I that links it all together.

Today's Strategic Context

While the strategic context during the 20th century's formative period of missile defense was certainly dynamic, most of it could be defined within the rubric of the Cold War. During this epoch, defense priorities and resourcing could always be calibrated against the Soviet Union's existential threat. In contrast, the 21st century's strategic context is much harder to define and has proven far more volatile. As the recently released *2014 Quadrennial Defense Review* summarized, "The global trends that will define the future security environment are characterized by a rapid rate of change and a complexity born of the multiple ways in which they intersect and influence one another. As a result, despite the growing availability and flow of information around the world, it is increasingly challenging to predict how global threats and opportunities will evolve."[16] Indeed, though the prospect of global thermonuclear war has diminished, myriad other strategic challenges have cropped up, each having

Missile Defense Agency's Flight Test 06b Ground-Based Interceptor launches from Vandenberg Air Force Base, June 2014 (U.S. Air Force/Michael Peterson)

the potential to wreak havoc on U.S. national interests at home and abroad as well as upon the global economy. Among these are nonstate criminal and terrorist organizations and their enablers such as North Korea and Iran, who have also developed or sought to develop nuclear weapons. In the Far East, China is rapidly building more advanced weapons of all types as it grows bolder in flexing its might in the East and South China seas. In Europe, Vladimir Putin's Russia has overturned the post–Cold War order by posturing against the North Atlantic Treaty Organization (NATO), defying U.S. policy in Syria, annexing Crimea, invading Ukraine, and intimidating the other former Eastern Bloc nations along its borders. Africa continues to seethe with political unrest, terrorism, and humanitarian crises, and the Arctic promises to become a new battleground in the international race for greater access to food and energy resources.

The Chairman's vision outlines the implications of all this for IAMD. First, within this evolving security environment, AMD remains vital in supporting the U.S. ability to project power and have freedom of movement and access to the world's strategic thoroughfares. Today's geopolitical volatility means that IAMD must be more integrated and flexible than ever to respond to a wider array of less predictable and more capable threats. Moreover, potential adversaries have steadily improved their arsenals in terms of both quantity and quality, incorporating upgrades in range, accuracy, mobility, speed, stealth, and targeting.[17] Second, these advanced capabilities and the proliferating air and missile threat have further collapsed the old paradigm of separate IAMD domains—regional and homeland. Now, the entire globe is a seamless battlespace within which air and missile attacks can easily and rapidly cross area of responsibility boundaries, placing a premium on coordination and integration between combatant commands (including U.S. Northern Command).[18] Third, over a decade of war and the economic collapse of 2008 have led to record U.S. budget deficits and the political impetus to reduce those deficits with smaller governmental budgets. The coincidence of these economic pressures and the increasing combatant command appetite for more and better IAMD systems obliges the joint force and Services to use extra care in setting priorities. IAMD in 2020 must be versatile, responsive, decisive, and *affordable*.[19] Finally, the ominous strategic context has not been lost on America's partners

and allies around the world. Never has the demand for IAMD systems and the protection they provide been greater.[20] From Japan and the Philippines to Qatar and Lithuania, more nations are turning to the United States for assistance in protecting themselves against attack. The U.S. response to this situation will be watched closely, not only by our allies but also by our potential adversaries; though demand for a protective U.S. AMD umbrella is peaking, our financial ability to provide it is on the wane.

The IAMD Threat Environment

While America contends with the difficulties of a dynamic strategic context, potential adversaries seek to capitalize on perceived opportunities. Countries such as Russia, China, North Korea, and Iran perceive U.S. fiscal burdens and political paralysis as promoting policies aimed at reducing and reapportioning its overseas presence. Thus, regional powers with goals inimical to U.S. interests are emboldened to strive for greater local influence as the tide of American power ebbs. This has caused a great deal of angst around the world; just ask the Ukrainians, Japanese, or Emirati. Moreover, global competitors have embraced an antiaccess/area-denial stratagem, backed by offensive air and missile weapons systems of greater capability and quantity, intended to keep the United States and its friends at bay. Complicating the threat picture even further is the prospect of rogue nations such as Iran and North Korea, against which traditional notions of deterrence are unreliable, developing weapons of mass destruction capable of delivery on ICBMs. Indeed, Iran possesses the "largest and most diverse missile arsenal in the Middle East," which it acquired in large part from foreign sources such as North Korea.[21] After a recent series of tests in early 2014, "Iranian Defense Minister Brig. Gen. Hossein Dehqan said [Iran's newest] long-range ballistic missile can evade enemies' anti-missile defense systems and has 'the capability of destroying massive targets and destroying multiple targets.'"[22] For its part, North Korea also has a huge missile arsenal, and its technology is advancing to the point where it could potentially threaten the U.S. mainland with nuclear warhead–armed ICBMs.[23] As the Chairman's vision warns, "The future IAMD environment will be characterized by a full spectrum of air and missile threats—ballistic missiles, air-breathing threats (cruise missiles, aircraft, UAS [unmanned aerial systems]), long-range rockets, artillery, and mortars—all utilizing a range of advanced capabilities—stealth, electronic attack, maneuvering reentry vehicles, decoys, and advanced terminal seekers with precision targeting."[24]

Never has the United States faced a more complex or comprehensive global challenge in this area, and the forecast for 2020 and beyond is no more optimistic. Threats will continue to progress, placing greater burdens on U.S. defensive capabilities and coverage as they become increasingly transregional and global. Additionally, air-breathing threats are experiencing a renaissance due to new technologies, many of which were pioneered in the United States but have now found their way into other hands. Unmanned aerial systems, stealthy cruise missiles, and hypersonic glide vehicles are becoming more common, threatening to exploit gaps and seams in traditional IAMD architectures. The challenge of detecting, tracking, and engaging these systems has compressed response times and decision cycles. Even at the tactical level, ground and maritime forces can be held at risk simply by sheer numbers of cheap, long-range rockets.[25] Without question, all of these facts indicate a dire and growing air and missile threat to the United States and its interests around the world. Success in negating it will take no less than a bold, holistic reimagining of America's IAMD.

A Forward Vision

Fortunately, *Joint IAMD Vision 2020* paints just the type of bold new picture that is required. It pulls no punches in assessing the threat, nor does it hold anything back in recommending solutions. Moreover, it rejects the notion that missile defense must equal *active*, kinetic missile defense. More must be done with passive, nonkinetic, C4I, and left-of-launch options. The document makes it clear that the first responsibility of joint IAMD is to deter adversaries by convincing them that attack is futile, then to prevent an attack in the first place by "killing the archer" rather than shooting down or absorbing his arrows. Should deterrence and prevention fail, joint IAMD melds active and passive defenses to mitigate and survive the assault. None of these actions is meant to be decisive alone. Joint IAMD is a necessary element within the broader context of the joint campaign intended to buy time and preserve the joint force during hostilities while imposing increasing cost and resource expenditure on the enemy, but it is neither intended nor able to afford victory by itself.[26] As the vision points out, "the link between offensive and defensive operations for IAMD is critical," and "all means, including penetrating assets" should be employed to "defeat large threat inventories."[27] Still, it is unreasonable to believe that offensive operations can wholly negate any sophisticated threat; therefore, the joint force must employ robust passive measures, such as CCD, dispersion, and hardening, as well as layered, complementary active defenses to survive air and missile attacks. Frankly, the failure of IAMD "risks suffering potentially devastating attacks" that could jeopardize an entire campaign.[28] Because of the extraordinarily high stakes, the integration of IAMD must extend beyond the joint force both horizontally and vertically to encompass "policy, strategy, concepts, tactics, and training" and will require the participation of interagency and international partners and allies.[29] Diplomacy, military-to-military engagements, officer exchanges, foreign disclosure of previously classified information, information-sharing, interoperability tests, and treaty negotiations are all vital features in this holistic approach to IAMD.

At the same time, the joint force cannot lose sight of its traditional responsibilities in IAMD capability development, but all stakeholders must

Sea-based X-band radar, world's largest phased-array X-band radar carried aboard mobile, ocean-going semisubmersible oil platform, transits waters of Joint Base Pearl Harbor–Hickam (U.S. Navy/ Daniel Barker)

proceed in a cost-conscious manner. Hitting bullets with bullets will always be more expensive than just firing bullets—thus, the combatant commands need to maximize resources already in hand and pay special attention to prioritizing capability and capacity gaps responsibly. Meanwhile, DOD, the Services, MDA, research laboratories, and industry must work together to identify and pursue only the most promising, realistic, and affordable solutions to IAMD's problems. This methodology is the only way the joint force is going to get the surveillance, identification, discrimination, fire control, and battle management improvements it needs to deter and defeat current and future threats.[30]

The Chairman outlined six imperatives designed to facilitate creation of the joint IAMD force necessary to confront the challenges of the coming decades. The first is to "incorporate, fuse, exploit, and leverage every bit of information available regardless of source or classification, and distribute it as needed to U.S. Forces and selected partners."[31] Intelligence, surveillance, and reconnaissance (ISR) provides the eyes and ears that the IAMD force requires to operate. Joint force commanders must properly prioritize and allocate limited ISR resources to support IAMD, and no source of ISR, whether traditional or nontraditional, national or tactical, should be considered too sacred for the IAMD mission. The United States fields many highly capable detection and collection systems, but their information chains remain rigidly stovepiped; the joint force must ruthlessly seek out and eliminate technical deficiencies and organizational barriers to information-sharing and enable the free flow of ISR data from national systems directly to the warfighters who need it.

The second imperative is to "make interdependent Joint and Combined force employment the baseline."[32] It is no exaggeration to say there is no such thing as U.S.-only or single-Service IAMD. The Nation simply cannot afford to do this mission without the synergies provided by the joint force and the cooperation of its partners and allies with whom "interdependence and interoperability breed efficiency and economy of resources."[33] From the earliest stages of planning, exercising, and employment, IAMD must leverage the comparative advantages of joint force components and partner nations. Successful examples to build upon include exercises such as U.S. Central Command's Air and Missile Defense Exercise; U.S. Strategic Command's Exercise Nimble Titan, a 22-nation, future-focused tabletop wargame that investigates multinational, strategic IAMD concerns; U.S. Pacific Command's Exercise Keen Edge; as well as the 8-nation Maritime Theater Missile Defense forum and various combatant command IAMD Centers of Excellence.

The third imperative is to "target development, modernization, fielding, and science and technology efforts to meet specific gaps in IAMD capabilities, all the while stressing affordability and interoperability."[34] While seemingly self-explanatory, in this imperative the Chairman asks for "special focus" on "closing high-leverage technology gaps such as an adversary's emerging seeker or missile development, and the development of U.S. non-kinetic capabilities."[35] This last point holds great promise, since nonkinetic means such as cyber, directed energy, and electronic attack have the potential to turn an enemy's advancements in sophistication into vulnerabilities, and at greatly reduced cost relative to kinetic options. JIAMDO in conjunction with the entire IAMD community must work closely through the JCIDS and Warfighter Involvement Processes to ensure requirements for new capabilities are prioritized, feasible, and affordable and address valid threats so that acquisition decision authorities pursue programs with realistic cost, schedule, and performance parameters. While programs such as Patriot, THAAD, and Aegis have been successful, there is still room for improvement as the Services develop new technologies in sensors (such as the Three-Dimensional Expeditionary Long Range Radar), interceptors (the Standard Missile-6 and railgun), and C4I (Cooperative Engagement Capability).

Imperative number four requires the joint force to "focus Passive Defense efforts on addressing potential capability and capacity shortfalls in air and missile defense."[36] Passive defense is a pillar of IAMD that has been around for a long time, but its importance is not reduced in the 21st century. The notion that passive defense measures, which help joint forces survive an attack, are a separate problem from other IAMD pillars is not acceptable. The joint force commander must

be able to assess passive defense effects, along with active defense and offensive operations, within planning and execution cycles. Failure to fully integrate and coordinate offensive, active, and passive actions places joint force objectives and resources at unnecessary risk. There are positive signs that DOD is taking this to heart, especially with respect to dispersal and hardening considerations within the Asia-Pacific region.[37] However, DOD needs to extend these plans to other regions as well.

The fifth imperative is to "establish and pursue policies to leverage partner contributions."[38] This is similar to the second imperative, but it merits additional emphasis because of how important it is to IAMD. While the second imperative speaks to warfighting operations, this one outlines the significance of long-term preparation running the gamut from political relationships to technology. Before combined employment can be brought to bear in a conflict, diplomats and warriors have a great deal of legwork to do. Regional IAMD architectures are not built in a day or on a whim. Painstaking establishment of bi- and multi-lateral agreements forged through cooperation and communication will pave the way to more effective regional IAMD. Moreover, a network of interoperable air and missile defenses comprised of a complementary mix of U.S. and partner nation weapons systems sends a clear message of deterrence to any would-be aggressor and offers assurance to international allies. In this vein, the United States should continue its full engagement with NATO to develop a viable air and missile defense strategy, building on its commitment to the European Phased Adaptive Approach while also encouraging greater burden-sharing by NATO and non-NATO nations in the region. Beyond NATO, the United States must work with the Gulf Cooperation Council countries to bolster AMD in Southwest Asia, via foreign military sales, information-sharing, and exercises, while also exploiting opportunities for trilateral cooperation and IAMD technology development with South Korea and Japan in the Asia-Pacific.

This article exemplifies the spirit of the sixth and final imperative, which directs the joint force to "create an awareness of the IAMD mission and the benefits of its proper utilization across the Department of Defense to include the development of the enabling framework of concepts, doctrine, acquisition, and war plans that support full integration of IAMD into combat operations."[39] Here, the Chairman recognizes that great ideas are useless if they are not communicated to the forces that will be called upon to implement them. This is a directive to the joint force and all IAMD stakeholders to move out smartly and educate each other on the IAMD mission and the way forward articulated in the vision. Commanders at every level need to understand how IAMD is supposed to work for the joint force and to train their people to effectively execute. The Joint Functional Component Command for Integrated Missile Defense and the Joint Staff J7 Joint Force Development could help lead the way here. In particular, the J7's December 2013 release of the *U.S. Planning Guide for Multinational Air and Missile Defense* along with JIAMDO's forthcoming *IAMD Roadmap* and revision of Joint Publication 3-01, *Countering Air and Missile Threats*, are positive steps forward.

The Chairman's *Joint IAMD Vision 2020* comes at a critical juncture in U.S. military history. As the Nation wraps up more than a decade of war in Southwest Asia, it must contend with new strategic challenges and air and missile threats, growing in both capability and quantity, from a variety of potential adversaries. Against this backdrop, success in deterring and, if necessary, winning future wars will require a robust, global IAMD architecture that incorporates affordable, innovative capability improvements to all four pillars of IAMD—active, passive, C4I, and attack operations—as well as a holistic approach to joint and combined planning, training, and employment. There is simply too much at stake to cut corners or leave anything on the table. Without question, IAMD is and must remain a cornerstone of U.S. national defense, for as the Chairman aptly asserts, "The effectiveness with which we field competent Joint IAMD capabilities will help prevent catastrophic attacks on the U.S. Homeland; secure the U.S. economy and the global economic system; and build secure, confident, and reliable Allies and partners."[40] The Chairman's *Joint IAMD Vision 2020* points the way. Now it is up to the joint force and the entire IAMD community to make it happen. **JFQ**

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Joint Publications (JPs) Under Revision (to be signed within 6 months)

JP 1-0, *Joint Personnel Support*

JP 1-04, *Legal Support to Military Operations*

JP 3-02.1, *Amphibious Embarkation and Debarkation*

JP 3-09, *Joint Fire Support*

JP 3-09.3, *Close Air Support*

JP 3-13.2, *Military Information Support Operations*

JP 3-61, *Public Affairs*

JP 6-0, *Joint Communications System*

JPs Revised (signed within last 6 months)

JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment* (May 21, 2014)

JP 3-02, *Amphibious Operations* (July 18, 2014)

JP 3-05, *Special Operations* (July 16, 2014)

JP 3-10, *Joint Security Operations in Theater* (November 13, 2014)

JP 3-12(R), *Cyberspace Operations* (February 5, 2013)

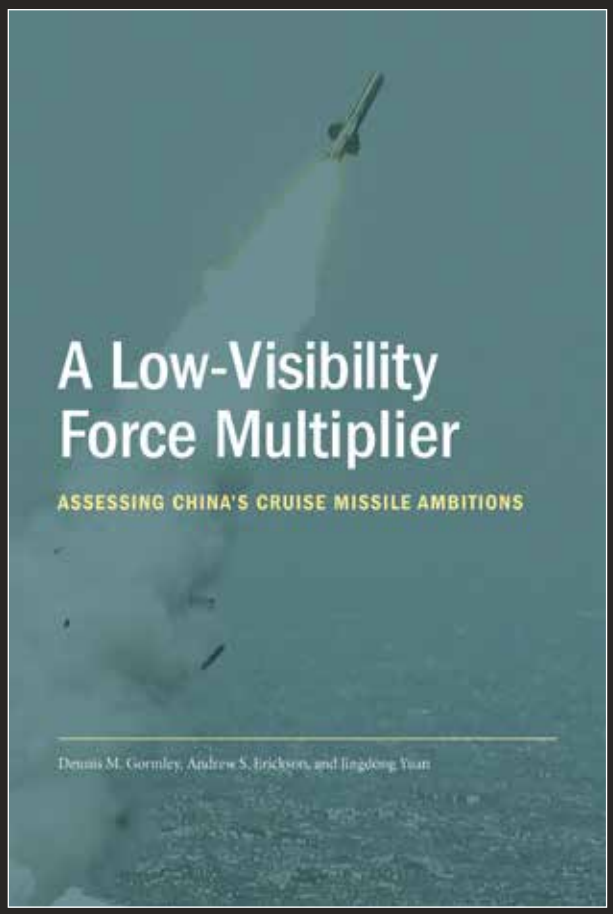
JP 3-26, *Counterterrorism* (October 24, 2014)

JP 3-40, *Countering Weapons of Mass Destruction* (October 31, 2014)

JP 3-52, *Joint Airspace Control* (November 13, 2014)

JP 3-63, *Detainee Operations* (November 13, 2014)

JP 4-10, *Operational Contract Support* (July 16, 2014)



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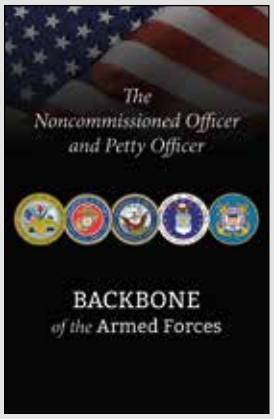

The Noncommissioned Officer and Petty Officer: Backbone of the Armed Forces

NDU Press, 2013 • 176 pp.

A first of its kind, this book—of, by, and for noncommissioned officers and petty officers—is a comprehensive explanation of enlisted leaders across the United States Armed Forces. It balances with the Services' NCO/PO leadership manuals and complements *The Armed Forces Officer*, the latest edition of which was published by NDU Press in 2007. Written by a team of Active, Reserve, and retired enlisted leaders from the five Service branches, this book describes how NCOs/POs fit into an organization, centers them in the Profession of Arms, defines their dual roles of complementing the officer and enabling the force, and exposes their international engagement. As Chairman of the Joint Chiefs of Staff General Martin E. Dempsey writes in his foreword to the book, "We know noncommissioned officers and petty officers to have exceptional competence, professional character, and soldierly grit—they are exemplars of our Profession of Arms."

Aspirational and fulfilling, this book helps prepare young men and women who strive to become NCOs/POs, re-inspires currently serving enlisted leaders, and stimulates reflection by those who no longer wear the uniform. It also gives those who have never served a comprehensive understanding of who these exceptional men and women are, and why they are known as the "Backbone of the Armed Forces."

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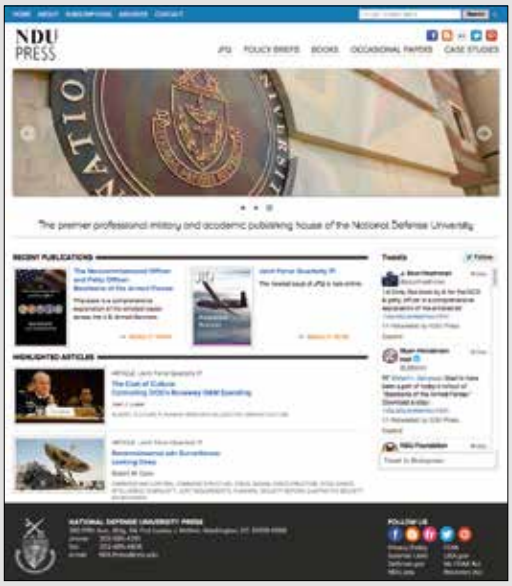

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