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THE PROFESSIONAL JOURNAL OF THE U.S. ARMY

JULY-AUGUST 2016

COMBINED ARMS CENTER, FORT LEAVENWORTH, KANSAS

Greetings!

As the deputy director of The Army Press, I have the great pleasure of serving as the interim editor in chief of *Military Review* and am privileged to provide our readers with this issue's preface.

First, a heartfelt thanks to Col. Anna Friederich-Maggard as she leaves The Army Press and retires from the U.S. Army. Her leadership was instrumental in the enhancement of *Military Review* and the creation of The Army Press. We now look forward to the arrival of our new director, Lt. Col. Katherine Guttormsen, who we expect will bring new perspectives and energy to *Military Review*.

This issue of our journal focuses on innovation. We are fortunate to have contributions on this theme from several high-profile authors and leaders. Lt. Gen. Thomas Spoehr, director of the Army Office of Business Transformation, discusses how Army leaders must also be innovative managers for their units to become high-performing organizations. Lt. Gen. Edward C. Cardon, the commander of U.S. Army Cyber Command, coauthors an article stressing the importance of innovation in cyberspace operations. Additionally, an article from Dr. Thomas Marks and Dr. David Ucko, written with the help of Gen. Carlos A. Ospina, former commander of the National Army of Colombia, offers much-needed historical context for understanding the current peace process in Colombia between the government and the insurgent group *Fuerzas Armadas Revolucionarias de Colombia* (FARC).

Thanks to all our contributors for making this issue of *Military Review* interesting and innovative. Please continue to follow us at: http://usacac.army.mil/cac2/militaryreview/index.asp or http://armypress.dodlive.mil/. ■

A wave splashes onto an MK-2 bridge erection boat operated by U.S. Army Reserve soldiers Staff Sgt. Chad Bentley, bridge crew member, and Spc. Ben Adams, medic, from 341st Engineer Company (Multi-Role Bridge), during a sling loading operation 31 July 2015 on the Arkansas River near Fort Chaffee, Arkansas.

(Photo by Master Sgt. Michel Sauret, U.S. Army)

The Army Press wants to hear from you!

THE ARMY PRESS

Encouraging Writing Across the Force

The Army Press now has an online platform for writers to publish their work. The Army Press Online exists to support the Army University and adds to existing publishing opportunities already available through the Combat Studies Institute (CSI) and *Military Review*.

For more information about publishing with the Army Press, visit http://armypress.dodlive.mil/publishing-iniative/.

Themes and Suggested Topics for Future Editions

Tides of History: How they Shape the Security Environment

November-December 2016

- Mao's three stages of revolutionary warfare and the rise of Islamic State and Boko Haram; winning by outgoverning
- Collisions of culture: The struggle for cultural hegemony in stability operations. Can a nation survive without a common national narrative?
- Armies as a cultural leveler: How are armies key to developing a national narrative and identity?
- Open borders: Is North America evolving toward European Union-style governance? What are the implications for the U.S. military if North America becomes a borderless continent?
- Case studies: histories of illegal immigration and how such have shaped national development in various countries
- Does the military have a role in saving democracy from itself? Compare and contrast the military's role in the life of the Weimar Republic and Mohamed Morsi's Muslim Brotherhood rule of Egypt
- How can the Department of Defense better leverage international military education and training to support U.S. Army activities in geographical regions?

"Sacred Cows": What Should Go Away But Won't

January-February 2017

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- How social change is having an impact on the Army
- Relevance of the Uniform Code of Military Justice: What is the state of military justice and military policing, including corrections? What crimes do soldiers commit, not just against detainees but also against other soldiers, their families, civilians, or unified action partners? How well do people accused of crimes receive due process? Is military justice applied fairly and equitably across all ranks?
  Is racism or excessive force an issue of concern for military police? How well trained are military police as compared to civilian counterparts?

Mission Command Revisited

March-April 2017

- Has the philosophy of mission command taken hold? In what ways has it succeeded or failed?
- Doctrine 2015: Is it working?
- Span of control: How do automated mission command systems impact it?
- Case studies: the use of the Army design methodology on operations
- Modularity ten years after: an evaluation
- Noncommissioned officers (NCOs) and mission command: Are we blurring too much the lines between officer/NCO duties and responsibilities? Are we training soldiers or quasi-commissioned officers? What is the impact of changing NCO evaluation reports, schooling, and the Army University on the enlisted force?

A U.S. Army soldier competes during the 2015 Best Ranger Competition at Fort Benning, Georgia on 12 April 2015. The competition started in 1982 as a way to honor Lt. Gen. David E. Grange Jr. and seeks to determine the best two-man team from the U.S. Armed Forces.

(Photo by Patrick A. Albright, U.S. Army)

Dealing with a Changing World

May-June 2017

- Security implications of the new Syrian, Iranian, and Russian triad in the Middle East.
- Security implications of growing Chinese hegemony over the South China Sea.
- Security implications of the new Islamic Europe.
- Filling the ranks: how to deal with challenge of finding people who want to serve in the military and who are qualified.
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- *Clash of Civilizations* as the new paradigm for global conflict: Was Samuel Huntington right?

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Mark A. Milley—General, United States Army Chief of Staff

Official:

Gerald B. O'Keefe—Administrative Assistant to the Secretary of the Army

(Photo by Staff Sgt. Todd A. Christopherson, U.S. Army)

About the Cover: *1st Lt. Jordan Farrar fires a tube-launched, optically tracked, wire-guided (TOW) missile while Cpl. Christopher Parker observes at the heavy weapons range on Forward Operating Base Salerno, Khowst Province, Afghanistan, 14 August 2013. Farrar and Parker are assigned to 2nd Battalion, 506th Infantry Regiment, 4th Brigade Combat Team, 101st Airborne Division (Air Assault).*

Leading and Managing High-Performing Army Organizations

Lt. Gen. Thomas Spoehr, U.S. Army

Everyone wants to be a part of a high-performing organization. The difference is clear the moment you join one. People are motivated and purposeful, pride and morale are high, and things of importance are being effectively accomplished. High-performing teams and organizations are focused on their goals and typically far outperform similar outfits. What is the common denominator for high-performing organizations? The presence of great leadership and management.

The Army prides itself on its ability to provide inspired leadership. Dozens of books are written and thousands sold yearly on the merits of military leadership. But, to create and maintain a high-performing organization, both leadership and management must be present. Art and science? Yin and yang? Whatever the analogy, leadership without management is impaired by the lack of an enduring focus, while management without leadership feels mechanical and is unable to produce impressive results. Good leadership can be likened to the ability to recognize that a soldier deserves an award upon departure, while effective management ensures the soldier receives the award before he or she departs. If a leader mismanages an organization, then that leader puts the people and organization in a position to fail. Leadership and management are two sides of the same coin. Separating the functions, for example, in an arrangement where the commander practices leadership while a deputy provides management is imperfect; to achieve levels of high performance, all the top leaders in the organization must employ both qualities simultaneously and seamlessly.

Army Management

As mentioned, volumes have been written about Army leadership, but leadership by itself is insufficient; it also takes effective management to yield extraordinary results. So, where is the reference on how to manage in the Army, especially when it comes to large, complex organizations? Interestingly, the word "management" is absent from Army Doctrine Publication (ADP) 6-22, *Army Leadership*. In fact, it is generally missing from all Army doctrine and reference publications. Indications are that it was downplayed as a visceral reaction to the perception that certain leaders attempted to "over-manage" Army formations in the Vietnam War.[1] Hence, training is provided to leaders on the basic management functions necessary to operate at the company or battalion level, such as developing a training plan or managing a unit maintenance program. Yet, after that point in their careers, Army leaders receive little education in management techniques. The management skills they must employ in succeeding at more complex assignments at brigade level and beyond are generally acquired either through self-development or observation. Unfortunately, what Gen. Don Starry wrote in 1974 while serving as the commanding general of Fort Knox, Kentucky, is largely still true today:

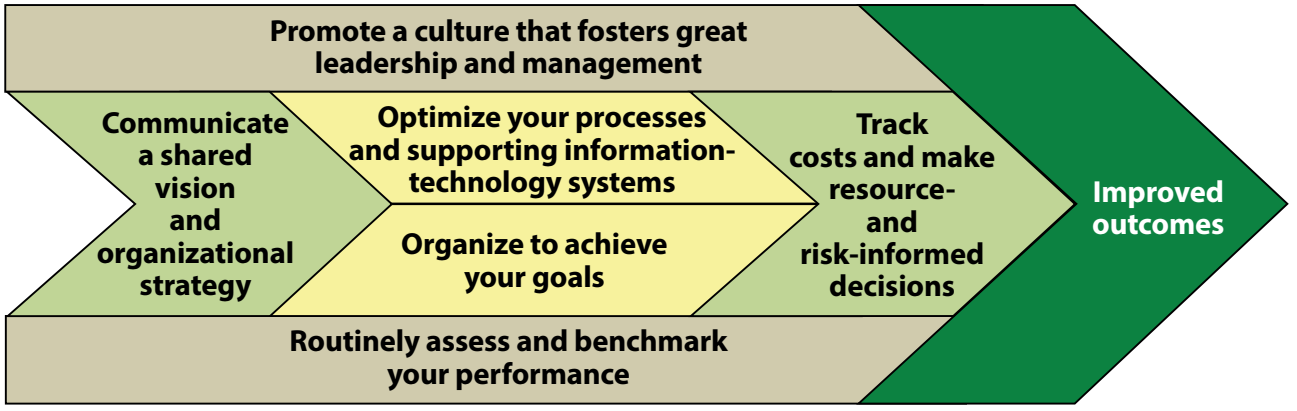
> Army officers are not very good managers. For example, I'm the mayor of the third or fourth largest city in Kentucky, with an annual operating budget of over $100 million. Nothing in my background, except my three years in ACSFOR (Assistant Chief of Staff for Force Development), equipped

(Photo by Master Sgt. Hector Garcia, U.S. Army)

Katherine Hammack, assistant secretary of the Army for installations, energy, and environment, and Maj. Gen. Gwen Bingham, commanding general of TACOM (formerly Tank-automotive and Armaments Command) Life Cycle Management Command, tour Anniston Army Depot 28 September 2015 in Anniston, Alabama. The visit provided a forum for discussion of numerous topics of interest, to include infrastructure, environmental challenges and concerns, and renewable energy, as well as community leadership and outreach. Maj. Gen. Bingham exemplifies how Army leaders must employ exceptional management skills to succeed in more complex assignments.

> me adequately to hold this job. And I'm trying to straighten out a lot of pretty bad situations left me by some great guys who preceded me but who, like me, really hadn't been trained for the job.[2]

The gaps in our leaders' knowledge of management are not limited to military officers. In a 2016 survey conducted at the Army's civilian professional development school, the Army Management Staff College, General Schedule 14- and 15-level students surveyed reported their number one professional gap was in business acumen.[3] The significance of this shortfall in business and managerial acumen is growing as the Army must adapt to reduced funding and the accompanying requirement to make the most of available resources to maintain readiness. Moreover, additional



(Graphic from AR 5-1, *Management of Army Business Operations*)

Figure. The Army Management Framework

impetus comes from the need to assure a perpetually skeptical American media and Congress that the Army is truly a good steward of the money provided.

However, there are some promising signs. The Command and General Staff College at Fort Leavenworth, Kansas, offered a 2016 spring elective called "Leading and Managing High Performing Organizations," and the Army Management Staff College is pursuing modifications to its curriculum to include more coverage of traditional management- and business-operations topics. Additionally, as the demands of long-term conflict ease, more Army officers are electing to attend graduate education in management and business.[4] Also, the program of continued education for Army general officers and senior executive service members includes short seminars at leading graduate business schools.

Army Management Framework

Perhaps most encouragingly, with the publication of Army Regulation 5-1, *Management of Army Business Operations*, in November 2015, a useful framework has been approved for the application of management techniques in Army organizations (see figure).[5]

The Army Management Framework (AMF) is neither absolute nor immutable. It will undoubtedly change as the understanding of what is required for success advances. But, it provides a conceptual model that relates best Army management practices that, when paired with great leadership, have consistently proven to result in improved outcomes.

Significantly, the AMF is not just applicable to the institutional force. Its principles have repeatedly proven their value to operational formations as well. Today, the six tenets of the AMF, referenced in the figure, are used in many Army organizations, driving increased levels of performance. What makes up these tenets of the AMF and how have Army organizations found them useful? The remainder of this article will address each tenet to answer those questions.

Promote a culture that fosters great leadership and management. Because of its pervasive influence, the first tenet appropriately addresses culture. To employ the elements of effective management, Army culture must value it. However, this is not a universally accepted attribute in the Army today. By way of illustration, imagine the reaction if a division commander, attempting to pay a compliment to one of his battalion commanders, publicly exclaimed, "Smith, you are the best damn manager in this division!" How might Smith feel? What is likely is that his or her fellow battalion commanders would silently say to themselves, "I'm glad he didn't say that about me!"

The impact of such institutional aversion to being a labeled a good manager vice leader is evident in the previously discussed 2016 Army Management Staff College survey. Students often cited a culture that does not value business acumen as a primary reason why they felt professionally unprepared for that domain.[6] What are some of the tangible manifestations of a culture that does not value management in our Army today? We will discuss a few below.

Resource management is often reduced to a simple and very wasteful "use it or lose it" approach. It is often dismissed derisively as the province of the "bean counters" and is not considered a high priority among the many responsibilities of command. Consequently, matters of cost, organizational design, information system capabilities, and performance management are not viewed as "commander's business" and are often relegated to deputies or executive officers.

In contrast, at Headquarters, U.S. Army Pacific (USARPAC), leadership and management go hand in glove, and the results have been impressive. Under the USARPAC commanding general's direction, purposeful management is emphasized as a valued command-centric trait and a key element of the command culture.

One technique the USARPAC command effectively uses to inculcate management into its command climate is a quarterly multi-echelon executive steering board to comprehensively review the command's progress against its strategic plan. According to the chief of staff, Maj. Gen. Chris Hughes, "This process drives organizational cross talk, collaboration, and critical thinking." Hughes continues, "Gen. Brooks constantly challenges his senior team to find ways to get more from their efforts: no new starts, only new outcomes."[7] Similarly, organizational change, innovation programs, and the institutionalization of a "cost culture"—evidence of a culture that highly values management practices—all enjoy a high priority at USARPAC.

Communicate a shared vision and organizational strategy. This tenet is fundamental. Despite the reputation of military leaders for being masters of strategic art, organizational strategies for noncontingency operations are often absent or deficient. Most military leaders are familiar with the process of devising a strategy and planning to defeat an adversary within a given area of operations. However, arguably, a more difficult task is to devise a multiyear strategy that will allow an organization to succeed in a complex, changing environment with multiple stakeholders, often with competing or conflicting interests. For example, consider the challenge involved in crafting a multiyear strategy for U.S. Army Recruiting Command to convince qualified American citizens that they should join the Army in sufficient numbers to meet evolving manpower requirements under changing social, economic, and demographic conditions. Because the skills needed to develop such a roadmap differ so significantly from normal operational art, Army leaders are often challenged by conducting such a task. Still, many are successful.

One example of managerial success is Fort Stewart, Georgia, home of the 3rd Infantry Division. The installation has won the coveted Army Community of Excellence award an unprecedented six times, most recently in 2015. To achieve such recognition in the face of stiff competition, Fort Stewart's culture recognizes that strategic planning, vision, and strategy development form the basis for everything that is done.[8] Bringing together a diverse group of tenants, senior mission-command representatives, and the garrison, Fort Stewart leadership effectively forges a shared vision where everyone can clearly see their interests represented.

Col. Townley R. Hedrick, garrison commander, offers, "Fort Stewart and Hunter Army Airfield are run using the IPB (Installation Planning Board) process to maintain a strategic, long-term focus on the installation's needs. The key to the successful IPB is the participation and buy-in of all stakeholders that live, work, train, and deploy on and from Fort Stewart and Hunter Army Airfield; combined with the guidance and vision of the Senior Commander."[9] The Fort Stewart strategic planning process is disciplined and repeatable, and it is an Army best practice.[10]

Routinely assess and benchmark your performance. Without a means to implement and measure execution, the best strategy is just another "coffee table book." That is why this third tenet is so critical and inextricably tied back to strategy development. You cannot objectively assess a strategy that does not contain tangible goals and objectives. And, you cannot effectively improve performance without goals. Therefore, the best strategies have their assessments built together in an integrated fashion.

The goals should adhere to the principles identified in the acronym SMART; they should be specific, measurable, achievable, results-focused, and time-bound.[11] And, when establishing goals and associated metrics, leaders should include some that are "stretches." Stretch goals inexorably pull the organization to levels of performance that at first blush may seem unachievable.

Army organizations often struggle with creating balance in the SMART concept, establishing so many measures that assessments become bogged down, or setting the bar too low to ensure a goal can be met.

(Photo courtesy of U.S. Army)

Col. Evan Rentz (right), Brooke Army Medical Center (BAMC) commander, discusses hospital performance with some of his leadership team. As the largest Department of Defense medical treatment facility, BAMC has become an Army leader in assessing and managing organizational performance.

Sessions to assess performance should be short and attended by key leaders, contain a balance of lagging and leading indicators, and be focused on the actions and decisions needed to fix underperforming areas.

Brooke Army Medical Center (BAMC) at Joint Base San Antonio, Texas, exemplifies Army best practice in this area. Consider the number of metrics and goals that are required to manage the largest medical center in the Department of Defense. The leadership at BAMC must monitor a multitude of metrics that include medical accreditation, safety, patient satisfaction, quality, and cost, in addition to all the other mandatory requirements of an Army organization. Without a system to manage and act on all these assessments, any commander would quickly become overwhelmed with data, and—in that environment—failure to recognize a downward trend could have tragic consequences.

To manage this flow of information, the BAMC leadership team has developed an extraordinarily sophisticated battle rhythm of assessments, each only taking an hour or less. On the same day of each week, the commander meets with his department heads and, on a rotating basis, discusses areas of organizational importance. For example, on the first Tuesday of the month, human resources indicators such as the status of awards, evaluations, and civilian personnel actions are reviewed. On the second Tuesday of the month, operations indicators such as the status of taskings, quarterly training tasks, deployments, and professional-filler-system readiness are reviewed. On the third Tuesday of the month, the business plan is reviewed, and clinical departments brief their performance compared to business plan targets and address actions they are taking to correct any performance gaps.

Finally, on the fourth Tuesday of the month, quality is addressed. Department heads provide an update on all open major events and risk-control actions. When reflecting on the success of the system, the current commander, Col. Evan Renz, remarked, "All meetings are tailored for efficiency, utilize 'dashboards' to emphasize only the relevant metrics in real time, and allow leaders to get back to their mission in less than one hour."[12]

Optimize your processes and supporting information technology systems. This tenet focuses on

continuous improvement. From the infantry squad to the Pentagon staff, all organizations are driven by processes. Some of these processes are inherited from our predecessors, while others are directed by policy. Regrettably, a process is sometimes prescribed to us by the old Army adage, "That's the way it has always been done here." Regardless of how our work processes originated, their importance to the long-term viability of our Army cannot be overstated. After all, organizational processes drive our daily battle rhythm, from ordering parts for an Abrams tank to awarding a multibillion dollar contract for a new weapon system.

Despite organizational processes having such an important role in all that is done in the Army, many are rarely examined or improved. Quite simply, this lack of attention sub-optimizes our efficiency and, in turn, our readiness. The longer a process has been in place, or the longer an organization allows a process to continue as is, the tougher it is to recognize inefficiencies.

At the Army's oldest continuously active arsenal, the Watervliet Arsenal in upstate New York, the tyranny of time is not part of any leader's vocabulary. This arsenal today has one of the most progressive continuous-improvement programs in the Army, despite being in operation for more than 202 years. It has a long-term commitment to steadily increase the efficiency of its manufacturing, and other processes such as talent management, through Lean and Six Sigma efforts.[13]

The arsenal begins the cycle with annual strategic planning that determines key performance indicators and performance targets for the coming year. To align continuous improvement with strategic planning, process-improvement events are planned to support pursuit of these targets. Every month, arsenal commander Col. Lee H. Schiller Jr. convenes his key leaders and representatives from the workforce for a stand-up around an operational-style type of board, similar to what one may find in a battlefield operations center. At this board, frank and spirited discussions take place concerning the progress being made toward mutually agreed-upon improvement goals, and, at the end of the huddle, all walk away as one team with common direction and priorities.

(Photo courtesy of Watervliet Arsenal)

Col. Lee Schiller Jr. (left) reviews progress with his arsenal leadership team at one of Watervliet's monthly continuous process review stand-ups 3 March 2016 at Watervliet Arsenal, Watervliet, New York.

One of the arsenal's current improvement projects that has generated a great deal of interest is its focus on the professional development of its diverse workforce. "We have been very aggressive in instituting Lean and Six Sigma methodologies into our operations," said Schiller. "But, as we ramped up those

efforts, it became clear that we had a training shortfall. Leaders and the workforce were not achieving the high level of performance required to move the arsenal forward." This became a focus for the next process-improvement event. "What we learned by looking at the workforce development process is that much of our previous focus was on making our production more efficient and not on people," Schiller said. "As difficult as it was to change this process (workforce development), we knew that our ability to grow in the Army's organic base was limited unless we did change."[14]

Similarly, the U.S. Army Recruiting Command at Fort Knox provides a superb example of an organization that determined its information technology (IT) systems were failing to meet its needs and took visionary action to remedy the situation. Army recruiting processes were being serviced by an outdated IT system that did not give recruiters and their commanders the tools needed to accomplish their missions. The many recruiting applications were not integrated, requiring separate log-in, and a laborious virtual private network (VPN) connection needed to be established to access routine information, which was very difficult when the recruiters were away from their stations.

The Recruiting Command commanding general, then Maj. Gen. Allen Batschelet, took time to fully understand the problem and subsequently marshalled the necessary external support to put the command on a trajectory to acquiring a state-of-the-art customer-relationship management application. With the same system businesses use to identify new customers, Recruiting Command devised the architecture to make the customer-relationship management application accessible from tablet computers without the need to first establish a VPN connection.[15] Although the conversion will take years, this is a solid first step in the right direction.

While in the midst of attempting these changes, Batschelet shared, "I'm finding bureaucratic courage more rare than battlefield courage."[16] What he was alluding to was how hard it was to find supporters willing to shortcut risk-averse processes to facilitate innovation. Implementing a significant effort like this is difficult and will typically not succeed without involved leadership and management. In this case, they were present.

Organize to achieve your goals. In a corporate setting, many companies find they must undertake moderate organizational change at least once a year and major change every four-to-five years. However, similar change is much less frequent in the Army, perhaps because the authority to modify the organization is reserved for the higher echelons.[17] But, hard is not impossible, and leaders must constantly keep a running estimate of how well their organizations remain suited to accomplish their missions based on both effectiveness and efficiency. And, when appropriate, they must implement change.

Artificial divisions in process management between organizations, continued organizational conflict, inequitable workload distribution, and excessive cycle time spent in completing a process may all be signs structural change is needed. This assessment comes naturally to Army planners when devising a task organization for a given operation by conducting a troops-to-task analysis and allocating forces appropriately.

Assessing the need for permanent change in a noncombat situation when members have become very accustomed to the existing organization is more challenging and typically encounters significant resistance. Army Medical Command's (MEDCOM) sweeping reorganization from five regional medical commands to four multifunctional regional health commands integrating medical, dental, public health, Warrior Care, and transition functions provides a great example of a command reorganizing itself to meet emerging mission requirements and a changing environment.[18]

Conceived by Lt. Gen. Patricia Horoho, then surgeon general, the reorganization began in 2015 with the intent to bring the command in line with the changing needs of the Army and to provide a single geographic point of accountability for health readiness in each region, aligned where possible to an Army corps. Prior to the reorganization, MEDCOM had twenty subordinate headquarters. Following the change, it had fourteen, allowing the command to become more agile and responsive.

However, accomplishing this needed reorganization proved to be a significant administrative and managerial challenge. Not only was the surgeon general required to obtain the approval of the Army senior leaders, but the proposal required repeated coordination with the defense health establishment, as well

as the affected members of Congress, to get to "yes." Despite these difficulties, MEDCOM persevered, and today, because of its efforts, the command is well on the road to a complete reorganization with all its expected benefits.[19]

In contrast, because Army investments do not produce bottom-line profits, and with so many of the intended benefits intangibles that cannot be calculated in dollar and cents, determining specific cost effectiveness is a more challenging endeavor. If, like private

(Photo by Kristen Schabert, U.S. Army)

The Bavaria Health Command holds an activation ceremony 25 September 2015 in Vilseck, Germany. The activation was an element of the larger U.S. Army Medical Command (MEDCOM) reorganization to achieve a balanced, agile, and integrated organization better aligned to enhance health readiness for the Army Force 2025 and beyond.

Track costs and make resource- and risk-informed decisions. Army organizations usually track their expenditures closely so they do not overspend but are typically challenged in tracking the full-burdened costs of their activities or processes, especially when they span multiple commands. A focus on execution concentrates on what is left in the checkbook, while a focus on cost can help measure and understand the outcomes or results obtained for the money spent.

Because businesses closely track their costs, they operate with somewhat of an advantage because they can easily assess whether a given expense or investment makes sense based on their base-line profit margin. One example of this is Apple's choice whether to build an iPhone case out of either plastic or aluminum, which in part was based on extensive cost-benefit analysis. business, Army organizations similarly knew the fully burdened cost of many of our internal processes, like maintenance contracts, leave form processing, or IT expenses, it is likely changes or different decisions would be made.

Encouragingly, to address capturing such costs to increase managerial efficiency and cut down on needless expenditures, many areas of the Army have begun to appreciate the need for better tracking of costs.

Headlining this push is the Army's effort to more accurately capture the cost of training. During the period of sequestration in 2013, Army leaders realized the models for training costs (e.g., collective training events such as a company live fire) were imprecise, and that underlying estimates did not represent actual costs. Since then, Army leaders have

commissioned a series of pilot exercises led by the Army G-3/5/7 to refine procedures and models by studying what operational units actually spend to execute the training strategy. The intent is to develop better, repeatable methods to estimate the cost of training and, thereby, make better-informed readiness decisions.

Brig. Gen. John P. "Pete" Johnson, who led the kick-off briefing for the cost-of-training pilot program given to the 3rd Brigade Combat Team, 1st Cavalry Division, in February 2016 explained the value in this way: "Stewardship of our precious training resources is commander's business, and these pilots are designed to better enable that critical role while also allowing the Army to better see itself."[20]

Usually because of external pressures, certain Army organizations have already become masters of cost consciousness. Army Test and Evaluation Command's Redstone Test Center (RTC) in Alabama is one such organization. Operating in a very competitive environment, RTC is responsible for testing aviation, missile, and sensor systems; subsystems; and components. Ninety-five percent of its funding comes from external customers, and those customers have options. If RTC's costs grow, they will go elsewhere. The commander, Col. Pat Mason, reports that in the past RTC had no way to understand its overhead costs such as IT, labor, and maintenance because they were "all lumped together in a blob."[21] Because of that shortfall, Mason has since implemented a sophisticated system of cost management so that he and his leaders can understand what they are spending in specific categories on a real-time basis.

Capitalizing on the flexibility and power of the General Fund Enterprise Business System, the Army's state-of-the-art resourcing system, Mason set up custom "cost centers" and "work breakdown schedules," allowing complete command transparency on estimates and actual expenses.[22] This enabled RTC to make better-informed, fact-based decisions. RTC's precision extends to having the uniformed members complete time cards so that their work can be appropriately identified and binned. This extraordinary visibility enabled RTC to quickly determine that it did not need four of its seventy helicopters and a major piece of test equipment. By turning them in, RTC reduced its overhead cost to customers.[23]

While most Army organizations do not face the same customer-centric challenges that RTC does, carefully managing cost can make any organization more efficient and facilitate more-informed decision making. With the budget forecast grim for the foreseeable future, the still-looming threat of sequestration, and the uncertainty of global mission requirements, the Army faces unprecedented challenges in remaining a strong and agile force.

Conclusion

While not a panacea, strengthening Army management will go a long way toward optimizing effectiveness and efficiency in order to fulfill the Army's obligation to the Nation. The AMF tenets provide the underpinnings of a structured, systematic approach to managing the Army at large as well as its individual components. Supporting this are the many Army leaders, both those mentioned above and many others, who are employing effective, purposeful management approaches to drive high performance in their organizations. They demonstrate that by pairing the tenets of the AMF with inspirational leadership the results are inevitably high-performing organizations, which are paramount to accomplishing the Army's mission to fight and win the Nation's wars.

Army Strong! ■

Biography

Lt. Gen. Thomas Spoehr, U.S. Army, is the director of the Army Office of Business Transformation, responsible for recommending ways and implementing policy for the Army to become more efficient in its business practices. He holds a BS from the College of William and Mary and an MA in public administration from Webster University. His prior assignments include director, Program Analysis and Evaluation, Headquarters, Department of the Army (HQDA); deputy commanding general, U.S. Forces–Iraq (Support); and director, Force Development, HQDA.

Notes

1. Richard A. Gabriel and Paul L. Savage, *Crisis in Command: Mismanagement in the Army* (New York: Hill and Wang, 1978), 20–21, provides a good discussion of the Army's reaction to the perception of being overmanaged in the Vietnam War.

2. Donn Starry, *Press On! Selected Works of General Donn A. Starry*, vol. 1, ed. Lewis Sorley (Fort Leavenworth, KS: U.S. Army Combined Arms Center, Combat Studies Institute, 2009), 538.

3. Brice H. Johnson, "It's Time to Rethink Business Training for the SES [senior executive service]," Government Executive website, 23 February 2016, 1, accessed 19 April 2016, https://www.govexec.com/media/gbc/docs/pdfs_edit/022216kp1.pdf.

4. Business administration is the most common graduate degree held by Army officers in 2016, with 2,752 officers that have a degree in that subject. David Martino, Human Resource Command (HRC), e-mail to author, HRC analysis, 17 March 2016.

5. Army Regulation 5-1, *Management of Army Business Operations* (Washington, DC: U.S. Government Printing Office, November 2015).

6. Johnson, "It's Time to Rethink," 2.

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12. Col. Evan M. Rentz, Brooke Army Medical Center commander, telephone conversation with author, 9 December 2015; Rentz, e-mail to author, 1 March 2016.

13. "What is Lean Six Sigma?" Lean Six Sigma Institute website, accessed 19 April 2016, http://www.leansixsigmainstitute.org/#!what-is-lss/c18pr. "Lean Six Sigma is a methodology to improve productivity and profitability. It is described on the organization's website: Lean, developed by Toyota, improves service speed or lead time by eliminating the waste in any process. Six Sigma, developed by Motorola, improves the quality of products and services by eliminating variability. Working together, Lean and Six Sigma improves the speed and quality of any process in any industry."

14. Visit by the author to Watervliet Arsenal, New York, 10 February 2016; Col. Lee H. Schiller Jr., e-mail to author, 2 March 2016.

15. Maj. Gen. Allan Batschelet, e-mail to author, 23 April 2015.

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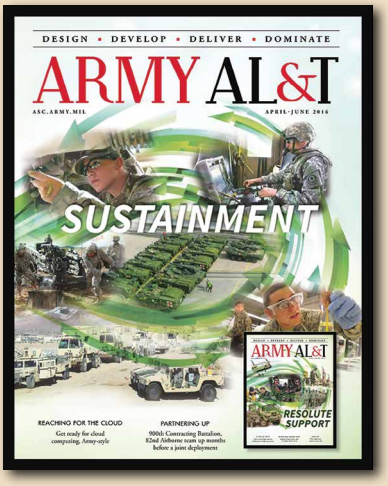


MR We Recommend

Army AL&T (Acquisition, Logistics and Technology) magazine is the United States Army Acquisition Support Center's (USAASC's) quarterly professional journal, comprising in-depth, analytically focused articles. The magazine's mission is to instruct members of the Army AL&T community about AL&T processes, procedures, techniques, and management philosophy; it is also to disseminate information pertinent to the professional development of workforce members and others engaged in AL&T activities. For more information about the magazine, including an editorial calendar and information on how to submit articles, advertisements, and art, visit http://usaasc.armyalt.com/#folio=1.

(Photo by Capt. Meredith Mathis, U.S. Army)

Spc. Casey Payne (left), 201st Expeditionary Military Intelligence Brigade, and Sgt. Andrew Lee, Company D, 14th Brigade Engineer Battalion, 2-2 ID (SBCT), pull security for a soldier from the 780th Military Intelligence Brigade as he sets up a patch panel antenna during a cyber training exercise 20 October 2015 on Joint Base Lewis-McChord, Washington.

I never blame myself when I'm not hitting. I just blame the bat, and if it keeps up, I change bats.[1]

—Yogi Berra

When developing capabilities, the Army could use a little of Yogi Berra's paradoxical wisdom that quickly gets to the heart of almost any matter. Like asking, "If Army tactical commanders are utterly dependent on cyberspace, then why do they have no way of seeing it?" All U.S. Army cyber capabilities ride on some kind of network, yet there is almost no means to provide real-time situational understanding of the cyberspace domain for tactical combat units.[2] This leaves tactical commanders blind to potential cyberspace threats and opportunities, lessens their ability to defend their own networks, and places traditional forms of combat power at risk.

The Army is keenly aware of this predicament and considers cyberspace situational understanding (cyber SU) a top priority, but a technological solution to bring a cyber SU system to conventional combat units seems years away.[3] At present, the Army is simply struggling to define precisely *what* tactical

Cyberspace Situational Understanding for Tactical Army Commanders

The Army Is Swinging for the Fence, but It Just Needs a Single

Lt. Col. William Jay Martin, U.S. Air Force, Retired
Emily Kaemmer

commanders need to know about cyberspace. What's more, even after the Army figures out what it wants cyber SU to be, it must survive the realpolitik of the acquisition process. Even the best capability proposals can become watered down, distorted, or combined with other programs, resulting in less than ideal outcomes. Moreover, it is not uncommon for capability developers, in an attempt to create a solution that does it all, to make requirements so stringent and complex that the entire effort becomes paralyzed. All of these scenarios can lead to protracted timelines or solutions that are marginal or even obsolete before reaching initial operational capability. This article details why the Army's pursuit of cyber SU is stagnant and recommends a simplified approach toward fixing it.

A Justified Need for Cyber SU

I want to thank you for making this day necessary.[4]

—Yogi Berra

Any discussion of a better approach toward acquiring a cyber SU system must first begin with proof that such a system is needed, and there is plenty of evidence to support that it is. The Department of

Defense's (DOD) *Joint Concept for Cyberspace* states that shared situational awareness of cyberspace is one of eight key elements to joint cyberspace operations.[5] This concept gave birth to the Joint Cyber Situational Awareness Initial Capabilities Document, which describes requirements for situational awareness of cyberspace at strategic echelons.[6] Coincidentally, much of the same information applicable at joint strategic echelons is also relevant at Army tactical echelons, where the Army has asserted that its need for cyber SU is most urgent.[7]

The *U.S. Army Capstone Concept* asserts that in order to maintain an advantage in cyberspace, the future Army must provide a capability for leaders and soldiers that helps them to understand how and when adversaries employ cyberspace capabilities, and how to respond.[8] It also recommends investments in mission command capabilities and systems that allow the Army to network the force and improve common situational understanding in order to gain and maintain a cyber electromagnetic activities advantage.[9] The *U.S. Army Operating Concept* identifies key capability development areas focused on science and technology initiatives to provide increased commanders' situational understanding through common operational pictures down to the tactical edge. This, it states, "may help commanders gain and maintain a position of relative advantage across the contested cyberspace domain and electromagnetic spectrum."[10]

Joint and Army doctrine publications also point toward the need for cyber SU. JP 3-12(R), *Cyberspace Operations*, explicitly states that cyberspace operations depend upon "current and predictive knowledge of cyberspace and the operational environment (OE)."[11] ADRP 6-0, *Mission Command*, stresses the importance of the common operating picture (COP) in building situational understanding.[12] FM 6-02, *Signal Support to Operations*, says "by integrating information from across the breadth of the area of operations, Army forces are able to maintain more relevant and complete situational understanding … [allowing] commanders to employ the right capabilities, in the right place, and at the right time."[13] Not surprisingly, these doctrine documents reflect the strategic message of senior cyber leaders.

In his *Joint Force Quarterly* article, "Ten Propositions Regarding Cyberspace Operations," Maj. Gen. Brett Williams explains the urgency of cyberspace situational awareness. Williams writes, "Developing cyber situational awareness is a high priority for DOD. The challenge is providing a complete picture of the domain that is consistent, accurate, current, and customizable for commanders at all levels."[14] Williams also concludes that commanders must be able to see and understand cyberspace in order to defend it.[15] This simple truth justifies a cyber SU capability for the Army. However, Army capability development efforts for cyber SU are presently stagnant.

Why Army Cyber SU Capability Development Efforts are Stagnant

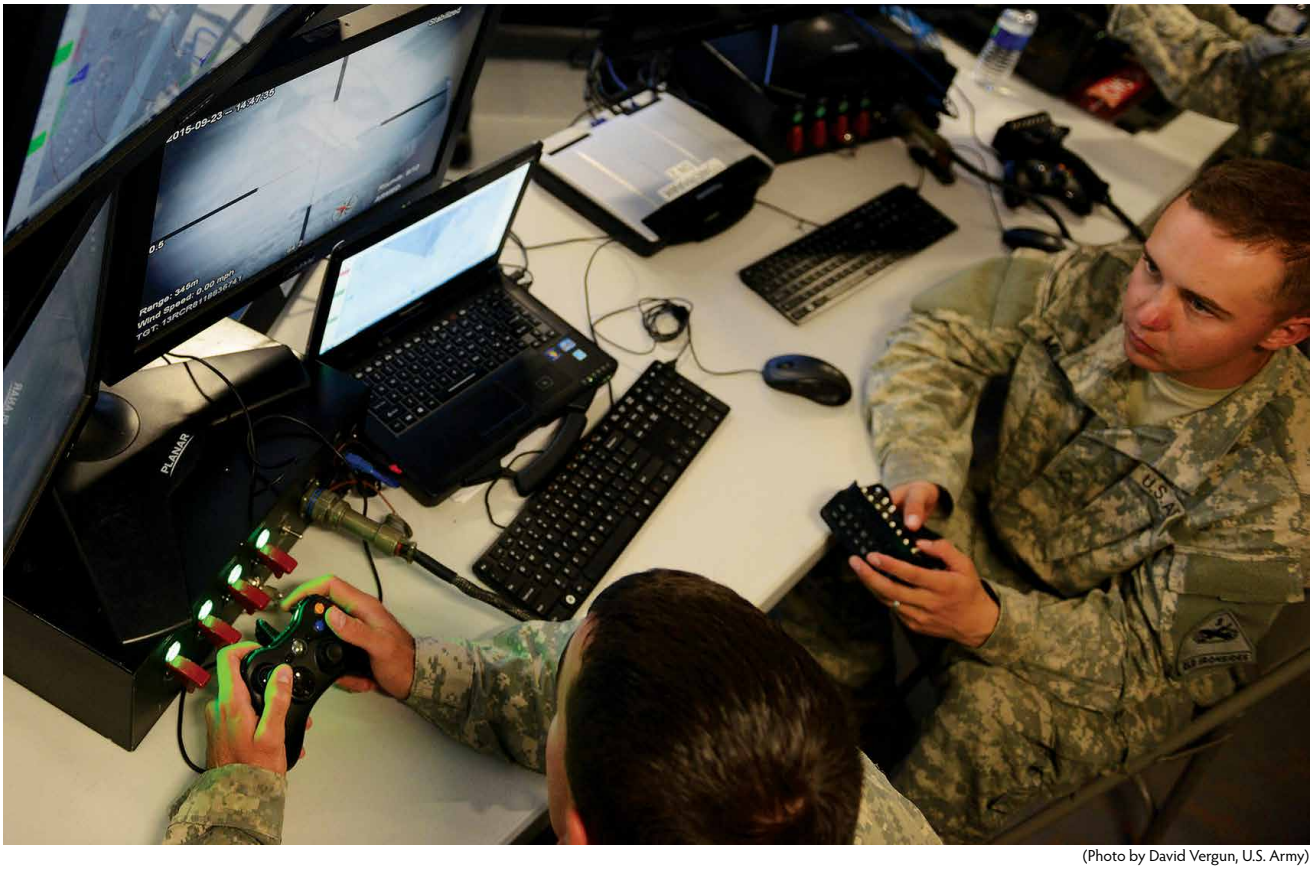
If you don't know where you are going, you might wind up someplace else.[16]

—Yogi Berra

In a perfect world, the Army could anticipate its capability needs far enough in advance to permit the traditional acquisition process to succeed. Unfortunately, innovation in cyberspace is moving too fast to make that timeline practical for cyber SU. The typical timeframe for identifying a need, writing the requirements, negotiating the Joint Capabilities Integration and Development System (JCIDS) process, and then producing a new widget is five to eight years. The JCIDS process attempts to accommodate information systems software development with a more efficient Information Technology (IT)-Box option.[17] Although the Army is utilizing the IT-Box, it has been slow to approve the first cyberspace-related requirements document.[18] One of the Army's challenges might lie in an acquisition system that is tied to old paradigms.

Training and Doctrine Command's Gen. David G. Perkins pointed out that the defense acquisition system is still geared toward filling gaps that differentiate us from a known enemy as opposed to increasing our rate of innovation.[19] Perkins said the Army must be willing to kill old programs and then put those resources into new and more transferrable technologies.[20] He added that in order to innovate, the Army must avoid creating requirements with too much specificity else they become self-confining.[21]

Clearly, the Army has a strong desire to innovate, but an outmoded acquisition system and old thinking are not the only things slowing them down. Another challenge is a discordant cyberspace capabilities development effort. Currently, there are several overlapping information system capability documents in draft.[22] All of them



(Photo by David Vergun, U.S. Army)

Cyberwarriors defend the network at the tactical operations center for the 2nd Armored Brigade Combat Team, 1st Armored Division, on Fort Bliss, Texas, during Network Integration Evaluation (NIE) 16.1. The NIE was conducted from 25 September to 8 October 2015.

promise capabilities applicable to cyber SU. Though the Army Capabilities Integration Center (ARCIC) attempted to coordinate these disparate efforts, no significant economies have as yet been achieved.

The assistant secretary of the Army for Acquisition, Logistics and Technology (ASA[ALT]) recently developed a coordinated approach to deliver cyberspace-related technologies.[23] However, it appears to be focused more on cyberspace defense and offense, not on enabling capabilities like cyber SU.[24] Although one of the ASA(ALT) goals is to create an integrated network operations capability that will increase understanding about the health of tactical networks, that capability appears to exclude other information pertaining to factors outside of friendly networks that might interest tactical commanders.[25] And, although in 2014 ASA(ALT) responded to ten operational needs statements from Army Cyber Command addressing near-term requirements, the primary focus has been on reducing network vulnerabilities and not cyber SU.[26] This top-down strategy is a positive step, but it has not yet translated into a coordinated cyberspace capabilities development effort at the bottom of the bureaucracy.

A Simple Approach for Army Cyber SU Capability Developers

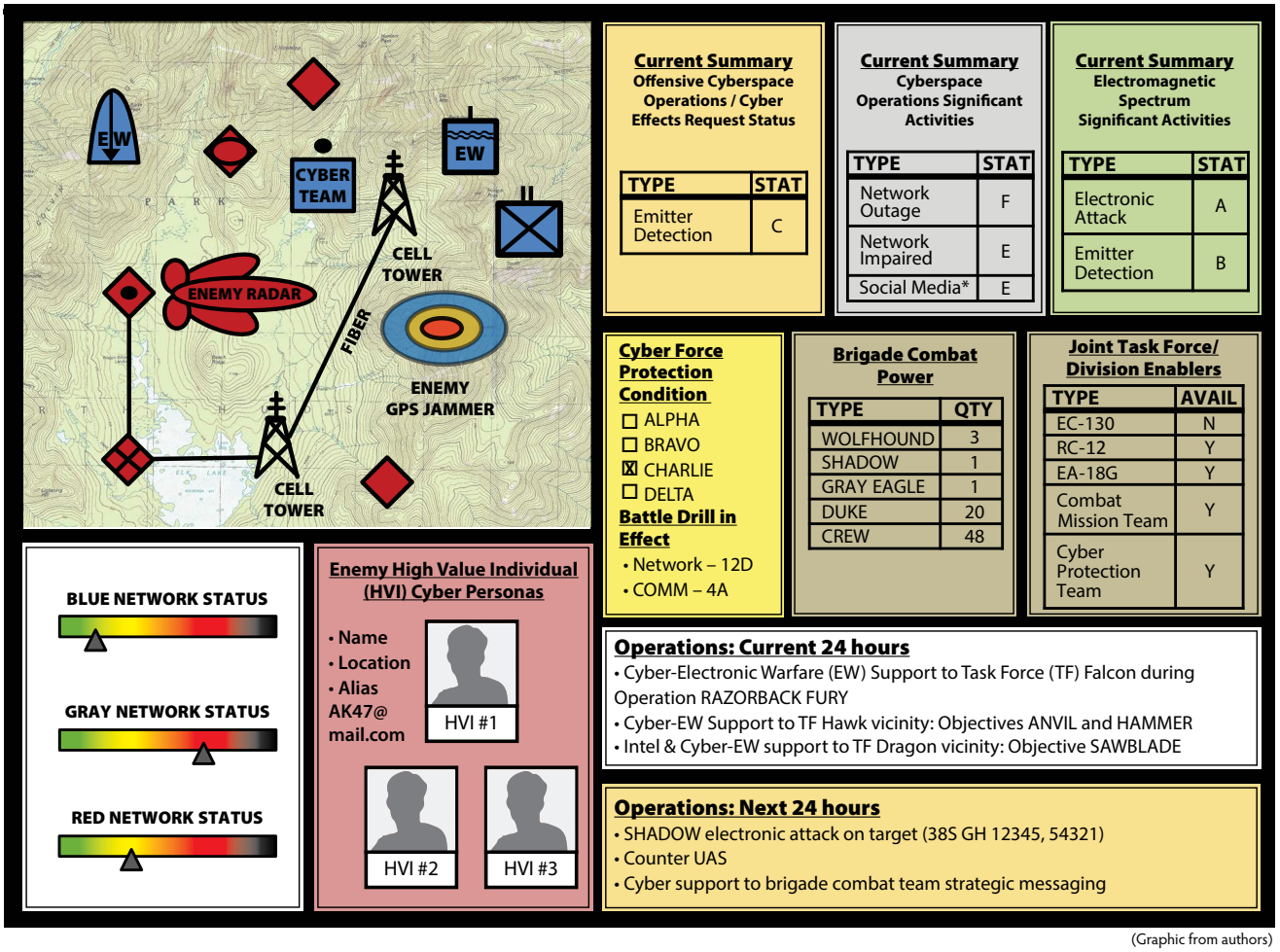
You can observe a lot just by watching.[27]

—Yogi Berra

The U.S. Army does not need a perfect cyber SU system ten years from now; rather, it needs a good enough cyber SU system *right now*. To achieve this, capability developers are advised to take a simple approach by answering three basic questions:

- What information do commanders need?
- How do we obtain and consolidate it?
- How should it be displayed?

In a broader sense, to successfully acquire cyber SU (or any other future capability), the Army must think of ways to innovate and incrementally reform a constraining acquisition process. First, Army capability developers



(Graphic from authors)

Figure. Sample Cyber Situational Understanding Overlay on the Common Operational Picture

must ascertain what information regarding cyberspace matters most to commanders.

During combat operations, commanders, supported by their staffs, monitor and assess progress, make decisions to exploit opportunities and counter threats, and direct the application of combat power at decisive points in time.[28] Cyberspace is a significant part of that calculus, especially concerning its effects on mission command and highly networked forms of combat power. Information that will likely comprise the basic content of the cyber SU overlay for the COP include friendly, host-nation, and enemy network status, cyber threats and enemy capabilities, key cyberspace infrastructure in the area of operations, cyberspace authorities and rules of engagement, and social media trends, to name a few.

Second, capability developers must consider where cyber SU information comes from and how to obtain it. Currently, only joint cyber mission forces are authorized to conduct cyberspace intelligence, surveillance, and reconnaissance and cyberspace operational preparation of the environment. So a great deal of information about cyberspace will originate and reside in databases at the national and strategic levels. That said, relevant data and information derived from organic information collection efforts at Army tactical echelons can provide important context.

One practical example is connecting a cyber-persona, derived from a national or joint cyberspace asset, with the identity of a real person (or organization) known to be residing in a unit's OE, as derived through local information collection. Fusing these sources provides greater situational understanding for the tactical commander and will help higher headquarters see cyberspace more clearly.

Third, capability developers must determine the best way to display the information. Cyber SU must provide adequate detail, but not too much. The Army can neither defend all of cyberspace, nor can it display all of it on a COP; otherwise, a commander's thinking could become obstructed by needless clutter. Commanders only need to know what impacts their mission, which aside from leveraging some joint cyberspace effects, consists mainly of employing traditional forms of combat power. Therefore, cyber SU must also allow information to be displayed contextually in order to facilitate broader situational understanding. This can be achieved through pictures, stoplight charts, gauges, ribbons, line-and-block diagrams, and side-by-side comparisons (as exemplified in the figure).

Fourth, capability developers must avoid writing system requirements that attempt to replace human judgment and decision making. Cyber SU must provide understanding; but it is up to tactical commanders and staffs to discern how to act on that understanding.

Fifth, and finally, the Army must think of ways to innovate and incrementally reform a constraining acquisition process. Army cyberspace requirements documents should strive to foster innovation by describing an overarching framework, grounded in sound doctrinal concepts that can be developed over time through successive software builds.[29] This is, in fact, the goal of the IT-Box. The challenge, therefore, is to identify the aspects of cyber SU that will become quickly outdated and make them modular, so they can be rapidly replaced by new innovations. In addition, Army capability developers must decide if cyber SU will be combined with other proposed or existing systems, or if it will remain pure. Combining multiple systems increases the risk that they could become bogged down for years in development. Meanwhile, the Army would be no closer to a cyber SU capability than it was in 2013 when the Army Cyberspace Operations Capabilities Based Assessment named its number one gap as commanders' situational understanding.[30]

Conclusion

The other teams could make trouble for us if they win.[31]

—Yogi Berra

While several resources currently aid in providing cyber SU, the Army lacks a well-coordinated capability development effort to define and aggregate cyber SU-related requirements. Although the JCIDS process provides capability development options with shorter timelines, it still appears inadequate as evidenced by the Army's inability to bring neither cyber SU nor any other cyber-related JCIDS document to approval.[32] Whatever the case, commanders cannot continue to relinquish key operational decisions about their OE because they lack situational understanding of the domain.

Cyber SU may not turn out to be a self-contained tool or system. Rather, the answer might be an aggregation of multiple situational understanding enabling capabilities. Therefore, the Army might be better off with an improvised system that gives them *some* cyber SU today, rather than a cure-all system that promises to deliver the world tomorrow.

Many of America's enemies have no bureaucracies and no stovepipes that hamper their ability to employ new technologies in battle. So, while Army capability developers are defining requirements, analyzing alternatives, and running the wickets of JCIDS documentation and approval, potential adversaries will be playing "small ball" and winning the cyber contest by utilizing commercial off-the-shelf technologies. To make a comeback, the Army needs a game changing play. Because, let's face it; "the future ain't what it used to be."[33]

Biographies

Lt. Col. William Jay Martin, U.S. Air Force, retired, is a senior military analyst with Command Decision Systems & Solutions, Inc. He received a BS from the University of Delaware and an MA from Louisiana Tech University. He is a graduate of the U.S. Air Force Weapons School, Air Force Air Command and Staff College, and Joint Forces Staff College.

Emily Kaemmer is a senior military analyst with Command Decision Systems & Solutions, Inc. She specializes in Army cyberspace capabilities development.

Notes

1. Yogi Berra, *The Yogi Book: I Really Didn't Say Everything I Said!* (New York: Workman Publishing Company, 1998).

2. Army Doctrine Publication 5-0, *The Operations Process* (Washington, DC: U.S. Government Printing Office [GPO], May 2012). Situational understanding is the product of applying analysis and judgment to relevant information to determine the relationship among the operational and mission variables to facilitate decision making. For the purposes of this paper, it equates with situational awareness, which is not defined in joint or Army doctrine.

3. The term cyberspace situational understanding (cyber SU) refers to a notional capability that provides relevant data and information about cyberspace for display on a common operational picture or commander's dashboard. Cyber SU (the capability) is distinguished from the phrase cyberspace situational awareness (cyber SA), which per Joint Publication (JP) 3-12(R), *Cyberspace Operations* (Washington, DC: U.S. GPO, February 2013), refers to the requisite current and predictive knowledge of cyberspace and the operational environment upon which cyberspace operations depend, including all factors affecting friendly and adversary cyberspace forces.

4. Yogi Berra, *The Yogi Book*. Said on Yogi Berra Appreciation Day, Saint Louis, Missouri, in 1947.

5. Department of Defense, *The Joint Concept for Cyberspace* (JCC) (August 2012), 9 (FOUO).

6. Joint Cyber Situational Awareness (Cyber SA) Initial Capabilities Document (ICD), 23 April 2012, approved by the Joint Chiefs of Staff Requirements Oversight Council (JROC). Available on the JROC Knowledge Management and Decision Support (KM/DS) System.

7. This statement is the authors' assessment after comparing the Joint Cyber SA ICD with the Army Cyber Command (ARCYBER)/2nd Army Support Element, *Army Cyberspace Operations Capabilities Based Assessment (CBA) Final Report* (U.S. Army Training and Doctrine Command [TRADOC], 15 December 2013), 34. See fig. 9, "Functional Needs Analysis Gap Prioritization," and send document requests to ARCYBER.

8. TRADOC Pamphlet (TP) 525-3-0, *The U.S. Army Capstone Concept* (Fort Eustis, VA: TRADOC, 2012), 28.

9. Ibid., 33.

10. TP 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World 2020-2040* (Fort Eustis, VA: TRADOC, 2014).

11. JP 3-12(R), *Cyberspace Operations* (Washington, DC: U.S. GPO, February 2013).

12. Army Doctrine Reference Publication 6-0, *Mission Command* (Washington, DC: U.S. GPO, May 2012).

13. Field Manual (FM) 6-02, *Signal Support to Operations* (Washington, DC: U.S. GPO, January 2014).

14. Brett T. Williams, "Ten Propositions Regarding Cyberspace Operations," *Joint Force Quarterly* 61 (2nd Quarter, 2011): 15. Retired Maj. Gen. Williams is the former J3 of U.S. Cyber Command.

15. Ibid.

16. Yogi Berra and Dave Kaplan, *When You Come to a Fork in the Road, Take It!: Inspiration and Wisdom From One of Baseball's Greatest Heroes* (New York: Hyperion Books, 2001).

17. Joint Requirements Oversight Council, *Manual for the Operation of the Joint Capabilities Integration and Development System* (JCIDS Manual) (12 February 2015).

18. A search of the Capabilities and Army Requirement Oversight Council Management System revealed that, to date, no cyberspace-related documents have been approved by the Army; meanwhile the Air Force and Navy have several approved documents.

19. David G. Perkins, "'Win in a Complex World'-But How?" *Army AL&T Magazine* (January–March 2015).

20. Ibid.

21. Ibid.

22. JCIDS Manual. Information System Capability Development Documents (CDDs) allow sponsors to describe initial minimum values for key performance parameters, key system attributes, and additional performance attributes. Sponsors of software systems, which benefit from continuous technology insertions, may approve follow on documents internally vice through the Joint Requirements Oversight Council.

23. Matthew Maier and Jerry Cook, "Hacking Cyber Stovepipes," *Army AL&T Magazine* (January–March 2015).

24. The three program executive offices (PEO) that have key roles in supporting future cyber technologies are (1) Command, Control, and Communications–Tactical (PEO C3T); (2) Enterprise Information Systems (PEO EIS); and (3) Intel, Electronic Warfare and Sensors (PEO IEW&S). PEO C3T is the lead for defense of the tactical network, PEO EIS is the lead for defense of the enterprise network, and PEO IEW&S is the lead for offensive cyberspace efforts.

25. Maier and Cook, "Hacking Cyber Stovepipes."

26. Ibid.

27. Yogi Berra and Dave H. Kaplan, *You Can Observe a Lot by Watching: What I've Learned About Teamwork From the Yankees and Life* (Hoboken, NJ: John Wiley & Sons, 2008).

28. FM 6-0, *Command and Staff Organization and Operations* (Washington, DC: U.S. GPO, May 2014).

29. Department of Defense, Instruction 5000.02, *Operation of the Defense Acquisition System*, 7 January 2015, accessed 26 April 2016, http://www.dtic.mil/whs/directives/corres/pdf/500002p.pdf. Several builds and deployments of software will typically be necessary to satisfy approved requirements for an increment of capability.

30. ARCYBER/2nd Army Support Element, *Army Cyberspace Operations*.

31. Michael J. Pellowski, *The Little Giant Book of Baseball Facts* (New York: Sterling Publishing Company, 2007).

32. A search of the Capabilities and Army Requirement Oversight Council Management System revealed that, to date, no cyberspace related documents have been approved by the Army; meanwhile the Air Force and Navy have several approved documents.

33. This is a misattributed quote, which Yogi Berra claims he never said. But there are conflicting sources. See Berra and Kaplan, *When You Come to a Fork in the Road, Take It*.

(Photo by Bryan Gatchell, Ansbach PAO)

U.S. Army Garrison Ansbach stakeholders and consultants work through plans for the future of Katterbach District 22 September 2015 in Ansbach, Germany.

Professional Case for Force Management

Col. James Lowry Kennedy Jr., U.S. Army, Retired

There is an unglamorous side of the Army … which requires your personal attention—that of managing the Army.

—Secretary of the Army Frank Pace, 1952

Officers arrive at the Command and General Staff Officer Course (CGSOC) with years of great operational experience in the tactical Army. Due to the command- and tactical-driven nature of Army professional development, many students are concerned about how to succeed as a battalion executive officer, as an operations officer, or in a similar key developmental position, rather than focusing on skills to be successful in nonoperational assignments. Because of this mind-set, many officers miss the point that CGSOC is designed to provide them with basic knowledge in all pertinent subjects, enabling them to succeed during the remainder of their field grade careers—careers that will be mostly be spent supporting senior leaders in making important decisions that

have considerable consequences for the future of the Army. Unfortunately, these officers fail to realize the importance of nonoperational topics and show little interest in the one subject they will use most in their future: *force management*.

These officers are very smart individuals, but they generally only see the Army from their company-grade tactical experiences, and they have little exposure to force management in their early careers. This is because much of force management is executed at the operational and strategic levels. Additionally, there has been little recent effort to include force management in unit-level professional development because of higher priorities caused by operational rotations.

The force-management process is the primary means of ensuring that the secretary of the Army and the Army staff meet the requirements set forth by Congress. Title 10 of the U.S. Code states that the secretary of the Army is responsible for "carrying out the functions of the Department of the Army so as to fulfill the current and future operational requirements of the unified and specified combatant commands."[1] It also states that the responsibility of the Army staff is to "prepare for such employment of the Army and for such, recruiting, organizing, supplying, equipping, training, servicing, mobilizing/demobilizing, and maintaining of the Army."[2] Department of Defense-assigned missions and combatant commander requirements to meet wartime needs are the two factors that drive the Army to develop a sufficient force to satisfy both within the context of the operational environment and utilizing available resources. Arguably, the vast majority of the effort of the Army staff and major commands is directly related to force management—the business side of the Army.

Force management, in simplest terms, is the process of providing the most capable Army within available resources by generating forces and providing operational units to combatant commanders in support of national objectives.[3] The Army has changed significantly throughout its history while meeting the Nation's needs, but the requirement for effective force management has remained a constant. From muskets to M4 rifles, horses to tanks, and balloons to unmanned aerial vehicles, Army leadership has developed and managed the Army through these changes. Majors today have lived the effects of force-management decisions such as the "Grow the Force" initiative, modularity, and nearly constant equipment fielding and distribution, but most do not know or understand the processes that affect change in the Army.[4] And, the future portends even more change. Testifying before the Senate Appropriations Committee's defense subcommittee in 2014, then Army Chief of Staff Gen. Ray Odierno outlined impacts on the force based on maintaining the balance between readiness, personnel, and modernization.[5]

Army Doctrine Reference Publication (ADRP) 6-22, *Army Leadership*, states, "Competent leadership implies managing change, adapting, and making it work for the entire team."[6] The Army helps develop this leadership competence in its field grade officers during CGSOC, which is generally the first formal opportunity to introduce new field grade officers to force management. These officers need to seize on this educational opportunity to succeed in their careers and contribute to their professional responsibility of running the Army. CGSOC is designed to open the students' eyes to the processes they will utilize over the rest of their career to carry on the legacy and tradition of managing the force as it changes to "Force 2025 and Beyond."[7]

Business Context

In the private sector, management organizes and coordinates the activities of businesses in order to achieve defined objectives. This includes creating corporate policy and then organizing, planning, funding, controlling, and directing organizational resources in order to achieve the objectives of that policy. The Army is, in essence, a global business that operates with a vision ("Force 2025 and Beyond"), mission (Title 10 and combatant commander requirements), business model (Army operating concept), funding (Army budget), and objectives (Army campaign plan) to meet new and evolving markets (partnerships and threats). Much as leaders move up the corporate ladder and are exposed to the financing, product development, and strategy of the company, leaders in the Army must learn and apply these same business concepts as they are promoted into positions of greater responsibility and gain a broader vision of the Army functions.

The depth and breadth of the management of the Army illustrated in figure 1 should justify to any new field grade officer why they need to have a basic understanding of the "business of the Army."[8] No other company in the world can boast the scale of assets and

(Graphic courtesy of James Lowry Kennedy Jr.)

Figure 1. Scale of the Army in a Civilian Context

variety of responsibilities the Army has as it accomplishes its missions: the sheer size of the budget, the considerable number of employees, the great expanse of land and high number of locations, the enormous amount of equipment, and the formidable scale of health care. As in the business world, all of the areas show change based on the need to meet ever-changing threats. Officers should ask themselves, "If I was being promoted to middle management in a large company, would I need to know how the company makes decisions on expanding or contracting, finances, personnel management, and adapting to markets to help my company and my career?" The answer would be yes, and it should be no different in the Army.

Why Force Management Is Important

There are many reasons why force management is important and why it should be stressed during CGOSC. The top eight reasons follow:

- Field grade officers do the heavy lifting.
- Managing change in the Army is at a critical point.
- Army officers are professionals.
- The future of the Army depends on it.
- Force management is part of the job.
- Force management links to every aspect of the Army at every level.
- Army officers are leaders.
- Force management will be included in follow-on assignments.

Field grade officers do the heavy lifting. Senior leaders rely on field grade officers to be subject-matter experts to help them run the Army and assist them during decision-making processes. Majors that appreciate the complexity and nuances of how the Army operates will set themselves apart from their peers and will be better prepared to understand, visualize, describe, and direct their organizations. In the Officer Professional Management System (OPMS) XXI Final Report of 1997, Gen. Dennis Reimer, then Army chief of staff, emphasized that "while warfighting must remain the paramount skill of the officer corps, the Army should begin to foster officers who thoroughly understand how the Army works as an institution."[9]

Managing change in the Army is at a critical point. Gen. David Perkins, commander of U.S. Army Training and Doctrine Command (TRADOC), in a briefing to TRADOC civilians, explained that the problem for the Army is "how to win in a complex world where the future is unknown, unknowable, and constantly changing."[10] Force management is the process that the Army uses to address that problem. He observed that the Army is structured around the conventional capabilities for heavy combat in the "Big Five" weapon systems—the Abrams tank, the Bradley fighting vehicle, the Patriot surface-to-air missile system, and the Apache and Blackhawk helicopters. However, he noted, the operational environment has changed and with it requirements for different capabilities. Perkins said this operational focus has been replaced by the need for harder-to-measure capabilities of "optimized soldier and team performance: capabilities overmatch, joint/interorganization interoperable, scalable and tailorable joint combined arms forces, and adaptive professionals and institutions to operate in complex environments."[11]

Today's field grade officers must prepare themselves to help build then lead the next Army by ensuring the required capabilities are developed. To assist them, in October 2014, TRADOC published TRADOC Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World, 2020-2024*.[12] This doctrine guides future force development through the identification of first-order capabilities the Army must possess to accomplish its missions. It identifies twenty enduring Army warfighting challenges that must be overcome.[13] Officers at organizations above brigade level should have a good understanding of this document because the Department of the Army is changing the organization of the Army to meet these new challenges with new capabilities.

Army officers are professionals. ADRP-1, *The Army Profession*, published in June 2015, states in chapter 1:

> The *Army Profession* is a unique vocation of experts certified in the ethical **design, generation**, support, and application of landpower, serving under civilian authority and entrusted to defend the Constitution and the rights and interests of the American people. An *Army professional* is a Soldier or Army Civilian who meets the Army Profession's certification criteria in **character, competence,** and **commitment.**[14] [bold is author emphasis]

As professionals, field grade officers are obligated to understand the basics of force-management concepts so they can better support Army "business" processes and increase their professional character, competence, and commitment. Leaders must understand the force-management systems in order to operate within them effectively no matter what position, branch, or specialty they hold.

The future of the Army depends on it. Fleetwood Mac sang, "Don't stop thinking about tomorrow, it will soon be here."[15] In ten years, when the current senior leaders have long-since retired, the majors of 2016 will be the strategic thinkers and planners of the Army, so they need to start understanding the anticipated future Army now. When the Army reaches the goal of "Force 2025 and Beyond," they will be colonels; they will be the brigade commanders and key staff officers leading the Army being built and designed today.

Recognizing the need to develop the current field grade officers to meet the challenges of the future, the Army produced *The Army Leader Development Strategy 2013 (ALDS)*.[16] The *ALDS* aims to develop agile, adaptive, and innovative leaders who thrive in conditions of uncertainty and chaos, and are capable of visualizing, describing, directing, leading, and assessing operations in complex environments and against adaptive enemies. Appendix A of the *ALDS* states that officers are given additional educational and training opportunities "to allow them to understand areas such as Congress, the Army budget, systems acquisition, research and development … and Army operations as a complex enterprise."[17] Understanding the basic processes of force management allows officers at all levels to then adjust quickly to defeat an evolving enemy. Field grade officers develop company grade officers into future leaders of the Army. Therefore, as professionals, majors and lieutenant colonels need to understand the "corporate" business management of the Army so they can develop their subordinates.

Force management is part of the job. Many new field grade officers have a huge misconception that force management does not apply to them or their careers, and that it is instead the purview of the roughly 250 functional area (FA) 50 force-management officers in the Army. This is far from the truth.

FA50 officers manage Army force development, force integration, and global force management. They participate as subject-matter experts, along with basic-branch officers, in strategic planning, requirements determination, capability development, new-equipment training, force integration, materiel acquisition, recruiting and manning the force, Army force generation, budgeting, and execution or prioritization of requirements.

However, simultaneously, and of principal importance to the CGSOC demographic, basic-branch officers often serve in key generating-force roles alongside FA50s. As an example, it is common for the brigade combat team organizational integrator at G-37 Force Management to be an armor or infantry officer, or for basic branch officers to serve as doctrine writers or capability developers at the Combined Arms Doctrine Directorate.

While the force-management professional performs a critical part within the business of the Army, commanders and directors are the instruments of actual change in Army organizations given force-management decisions. If a commander leaves force management to his FA50, he might as well leave discipline to his lawyer or medical readiness to his combat medic. Force management is commander's business.

Force management links to every aspect of the Army at every level. Arguably, force management is the one CGSOC subject officers will use most during the remainder of their careers. In tactical assignments, officers will experience force-management decisions mainly through new equipment fielding, modified table of organization and equipment (MTOE) changes, and resource management.

In strategic assignments, they will be the ones developing new capabilities, doctrine, tactics, and cost estimates. They will be measuring risk and providing options and information to senior leaders so those leaders can make decisions and run the business processes of the Army.

Field grade officers are leaders. Soldiers deserve leaders who understand the process of how and why decisions are made that impact a unit's organization, personnel, equipping, and funding. And, junior officers and NCOs look to field grade officers for answers during times of change. As a professional the answer cannot be, "Those people in the Pentagon do not know what they are doing." Or even worse, "I don't know."

Field grade officers must understand the force-management system to effectively manage and influence change inside and outside their organizations. They cannot resource, train, mentor, deploy, or sustain their organizations effectively without a thorough knowledge of where they fit into the bigger picture. They need to know how decisions made many levels up will impact them, such as when MTOEs change, budgets are lowered, or new equipment is fielded.

Force management will be included in follow-on assignments. One officer recently wrote his force-management instructor at Fort Leavenworth, Kansas, and told him that he had not been concerned with the force-management instruction while he was in CGSOC because he did not see any linkage to the battalion S3 and XO positions he would fill immediately after the course. However, after those two jobs, he was assigned to his branch

capabilities-development directorate and wished he had paid more attention during CGSOC.

Army careers are more than just at the brigade level and below. As figure 2 illustrates, the odds are likely that a field grade officer will spend much of his or her career outside the tactical environment.[18] Often, after majors successfully complete key developmental positions within their branch, they are moved to developmental assignments within the generating force where they will utilize force-management processes.

A recent Army War College report on senior officer talent management made a quite compelling point:

> Because advancement requires a "warrior" career profile, officers studiously avoid nonoperational assignments. These are universally regarded as hazardous to one's career, even though such assignments can develop the specialized expertise demanded by the majority of senior officer duty positions, which are predominately nonoperational.[19]

It is important to have leaders with experience in developing the force to meet the challenges of uncertain future operating environments as well as to bring those operational experiences to the generating force to help ensure the Army captures the proper requirements. These institutional assignments would not end a career but develop future leaders of the Army. For example, Gen. Raymond Odierno was the director of Force Programs, Office of the Deputy Chief of Staff for Operations and Plans, before he was the 4th Infantry Division commander and, eventually, the chief of staff of the Army. While knowing these key points is important, how the Army trains new field grades is critical to them obtaining a better doctrinal understanding of the processes.

CGSOC Curriculum

Department of the Army Pamphlet 600-3, *Commissioned Officer Professional Development and Career Management*, states that one of the goals of the officer education system is "to produce a corps of leaders who … understand how the Army runs."[20] To support this goal, CGSOC provides an eighteen-hour block of instruction titled "Force Management" in its core curriculum. The intent of this instruction is to familiarize the students with the basic principles and processes of force management. It is not designed to make them force-management experts but to provide an overview of the many interrelated processes, terms, and procedures used by the generating force to manage change within the Army so they can communicate within the profession.

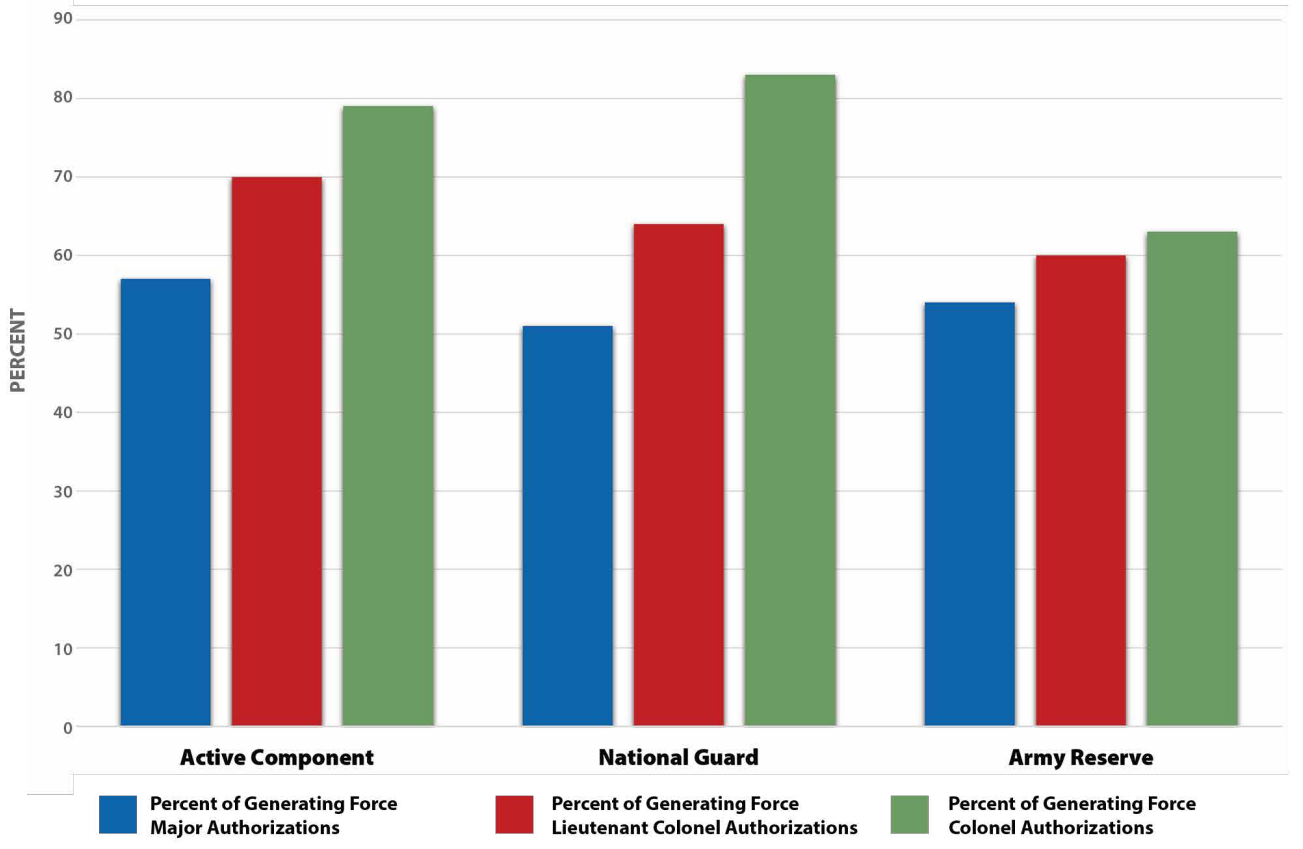
The block begins by laying a foundation with a discussion of documents such as *Title 10*, *The Army Plan*, and the *Army Operating Concept*, three strategic guidance documents that few CGSOC students have heard of and even fewer have read, and explains how these drive the development of the Army force. Next, students are exposed to the Joint Capabilities Integration and Development System (JCIDS) to learn how the Army and joint staff develop capabilities by looking at future needs and current capabilities and identifying gaps for which TRADOC then develops solutions within the doctrine, organization, training, materiel, leadership, personnel, facilities, and policy (DOTMLPF-P) framework. Students then learn how those different solutions are prioritized within the Army and become tables of organization and equipment or tables of distribution and allowances.

The total Army analysis process is introduced and discussed to demonstrate that there is a quantitative and qualitative process behind Army decisions. The next topic—planning, programming budgeting, and execution—provides an overview of the process that develops the budgets for each program, adjusts and approves them within the Army priorities, justifies the requests to Congress, allocates funds received, and manages the expenditure of funds to ensure missions are accomplished.

Discussion and readings then focus on how the Army acquires materiel using the Defense Acquisition System (DAS). While few officers in the Army are actually involved in the DAS directly, all need a basic understanding because they are impacted by the products.

The final topic of instruction is force integration. Students learn how the Army prioritizes requirements, and some of the key points of manning and equipping the force. Key Department of the Army guidance is discussed along with how the Army manages units within the new sustainable readiness process.

While not directly a force-management topic, operational contract support (OCS) is also covered to explain how the Army fills in the gaps in capability



(Graphic courtesy of James Lowry Kennedy Jr.)

Figure 2. Percentage of Generating Authorized Positions by Component

when operations occur. OCS planning is critical but often overlooked by leadership because of a lack of understanding on their part, the complexity of OCS, and a lack of ownership on the part of staffs. A working understanding of OCS is essential for officer development since contractors will be a part of the total force in operations for the known future, complementing uniformed forces in myriad situations with their specialized capabilities.

Evaluating student learning. For Academic Year 2017, the major formative assessments of the force-management block of instruction are three one-page discussion papers and three quizzes. The discussion papers require the students to read doctrine or a senior leader speech and then develop a one-page argumentative paper where they apply critical thinking to link the reading to the class subject matter. The three quizzes test the students' comprehension of the classroom discussions and materials.

Professional Development beyond the Classroom

To ensure continuity of force-management skills within the force after formal schooling opportunities, leaders should plan professional development sessions on force-management issues for their subordinate leaders. Discussion topics might include the budget submission in February, budget negotiations in Congress, or leader speeches. Leaders could invite program managers to discuss new acquisition programs or representatives from contracting support brigades to teach requirements determination and requiring activity responsibilities.

A resource manager from the G8 (financial management staff section) could provide a briefing on the budget-requirements development process, or an FA50 officer could give a corps- or division-level brief on the MTOE or force-management system website (FMSWeb) training. Commanders should not forget

to include reading and discussions of high-level strategic documents such as the *Quadrennial Defense Review*, the *National Security Strategy*, and the *Army Operating Concept*, and what they mean for the future of the Army.

Additionally, commanders must ensure force-management instruction is provided to NCOs. NCOs must not be overlooked in any force-management training opportunities since they are often the ones implementing, testing, evaluating, and providing feedback to force-management solutions. They need to understand the importance of their roles in the force-management processes more than anyone else.

Finally, two recommended readings are the U.S. War College's *How the Army Runs: A Senior Leader Reference Handbook* and *Kevlar Legions: The Transformation of the U.S. Army, 1989–2005* by Gen. John S. Brown.[21] *How the Army Runs*, available on the Army Force Management School and Army War College websites, explains many of the key Army force-management processes. *Kevlar Legions* traces the development of the Army structure and major equipment from 1989 through 2005.

Conclusion

A recent CGSOC graduate serving in West Africa wrote to his Fort Leavenworth force-management instructor urging him to "tell students to study force management and OCS hard, because division and above is where majors go to 'row the boat.'" He said, "I am always referring to my class slides."[22] CGSOC graduates cannot escape being part of the force-management process as they serve in field grade positions across the force in operational and strategic positions regardless of specialty or branch. The effort they put into being a competent professional within the business of the Army will determine not only how successful their career is but, more importantly, how well the Army changes to prevent, shape, and win in a complex world. ■

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Biography

Col. James Lowry Kennedy Jr., U.S. Army, retired, is an assistant professor at the U.S. Army Command and General Staff College campus at Fort Belvoir, Virginia, teaching force management and sustainment. He holds a BS in chemistry from Presbyterian College, an MS in logistics management from the Florida Institute of Technology, and an MMAS in military history from the Command General Staff College. He is working on a master of education degree from George Mason University.

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(Photo by Lawrence Torres III, U.S. Army)

Master Sgt. Charlie Sanders (left) and Capt. Lashon Bush, 2nd Signal Brigade, work on a mission event synchronization list in the Joint Cyber Control Center during Operation Deuce Lightning at Grafenwoehr, Germany on 23 February 2011. A team of more than sixty U.S. and German soldiers and airmen took part in the exercise to assess the 2nd Signal Brigade's ability to provide network support.

The Relevance of Culture

Recognizing the Importance of Innovation in Cyberspace Operations

Lt. Gen. Edward C. Cardon, U.S. Army

Col. David P. McHenry, U.S. Army

Lt. Col. Christopher Cline, U.S. Army

At the October 2015 Association of the United States Army annual meeting and exposition in Washington, D.C., Army Captains Brent Chapman, Matt Hutchinson, and Erick Waage demonstrated a "cyber rifle" tool they developed in ten hours using $150 in spare parts. This tool remotely disabled an unmanned aerial vehicle.[1] Shortly after the demonstration, the captains, all assigned to the Army

Cyber Institute at West Point, New York, wrote in *War on the Rocks* that the U.S military needed an open innovation process. They opined the existing military acquisition processes are no match for current and future cyberspace threats, which create the need for the military to rapidly field innovative responses.[2]

We are in the midst of a sea change in the conduct of warfare. In the past, commanders used information to shape operations. Today, we are witnessing how information and operating environments are overlapping and, in some cases, are one and the same. In Ukraine, Russia dominated the electromagnetic spectrum, disrupting Ukrainian military communications, geolocating Ukrainian battalions with unmanned aerial vehicles, and then destroying those battalions with devastating artillery strikes.[3] Russians also shut down Ukrainian power-distributor computers and attacked phone lines to prevent customers from reporting outages.[4]

Perhaps even more important, adversaries are using social media more effectively than U.S. forces to shape public perceptions and facilitate military operations. For example, the Russian government's social media dominance has shaped what information is available to Russian citizens and where they are getting information. Similarly, the Islamic State leverages social media as a strategic weapon to shape the public narrative and to recruit and finance. Such growing use of electronic warfare, cyber warfare, and information operations in hybrid war predicates the need for valuing innovation in cyberspace operations.

The U.S. Army is losing ground daily by not leveraging the innovations of our adversaries and those of the civilian sector. The Army cyberspace community, like most, is witnessing the need for paradigm shifts in how leaders think about, advantage, and foster innovation. There is a need to relook how the Army innovates internally while leveraging industry in new ways to innovate using external solutions. The old models are outdated, and what one sees in cyberspace makes these paradigm shifts an imperative for the entire military.

As Chapman, Hutchinson, and Waage demonstrate, the Army possesses the talent that can provide the pathway to innovation. Leaders must use this internal talent to grow a culture of innovation that will ensure current and future mission success. To address the challenges of complex and continually evolving information and operating environments, we must examine many of our own paradigms for how we address innovation across the force.

Innovation Defined

In November 2014, then Secretary of Defense Chuck Hagel announced the Defense Innovation Initiative to highlight the Department of Defense's (DOD's) need to adopt innovative practices and means of operating in increasingly contested environments. Hagel noted, "We are entering an era where American dominance in key warfighting domains is eroding, and we must find new and creative ways to sustain, and in some areas expand, our advantages even as we deal with more limited resources."[5] Current Secretary of Defense Ash Carter has sustained the momentum. DOD continues to expand cooperative efforts with Silicon Valley through initiatives such as Defense Innovation Unit–Experimental (DIUx) that seek to build and strengthen relationships with new and existing innovators.[6] In doing so, the secretary highlights that many military innovations can and should come from our industry partners.

In many ways, innovation has become a nebulous term that describes all things new from automobiles to mattresses. Innovation is simply anything novel and useful that one implements. Geoffrey A. Moore describes *application innovation* as "creating differentiation by finding and exploiting a new application or use for an existing technology."[7] Meanwhile, Elaine Dundon speaks of "the profitable implementation of strategic creativity."[8] For cyberspace operations, we offer the following definition of innovation: the implementation and integration of new concepts, processes, and material that enhance mission capability. Organizations can enhance innovation through collaboration, flexibility, creativity, and resourcing.

Innovation in Cyberspace

The mercurial nature of cyberspace presents a number of novel challenges to the warfighter. A constant influx of emerging technologies, practices, and techniques define the information and operating environments. The time between acquisition and obsolescence adds to this complexity. Threats come from highly capable and resourced nation-state actors, terrorist and criminal organizations and individuals, and hacktivists. The cost barriers to entry continue to decline for adversaries: a successful hack only has to be right once; a capable defense has to be right 100 percent of the time.

Unlike in conventional war, the United States does not have a monopoly on the means to conduct cyberspace operations. This requires the military community to assess honestly its strengths and vulnerabilities when it comes to offense and defense. The Army needs to approach the information environment with the recognition that innovative solutions may be both external and internal.

(Photo by Capt. Meredith Mathis, U.S. Army)

A soldier assigned to the 780th Military Intelligence Brigade on Fort Meade, Maryland, sets up low-level voice intercept equipment 21 October 2015 during a cyber integration exercise on Joint Base Lewis-McChord, Washington.

While military innovation always played a role in the advancement of warfighting, institutional headquarters often struggled to incorporate and support tactical innovations. In many instances, this results in looking outward for innovations and adopting them for internal use through a top-down approach. Within the military, leaders tend to favor the initiatives of a select few at the top, often regardless of expertise, rather than those of the population at large. However, the DOD needs innovations introduced by individuals—a bottom-up approach—to maintain the initiative in dynamic information and operating environments.

To affect operations, the cyberspace community must challenge the military norms and become a community with the resources, embraced values, and behavior that promote an innovative mindset and ability to evolve. A culture of innovation views new thinking and experimentation that address operational, procedural, technical, and other challenges influencing cyberspace operations as the norm.

The Innovation Imperative

Addressing cyberspace challenges by responding to the innovation imperative requires leaders to adopt a culture that fosters and rewards innovative practices. Without leader emphasis, innovation initiatives will fail. Retired Gen. Stanley McChrystal recounts in *Team of Teams* how he realized that he needed a different leadership style to defeat a highly adaptable enemy. Rather than serve as a "chess master" and drive outcomes through top-driven decision-making, McChrystal took on the role of a "gardener" and focused on shaping the ecosystem.[9] McChrystal describes how he shaped culture by example and continuously driving the narrative.[10] Like McChrystal, to shape a culture that propels

(Photo courtesy of U.S. Army)

A soldier with the 780th Military Intelligence Brigade conducts cyber support operations through improvised use of commercial, off-the-shelf equipment 24 January 2016 during a training rotation for the 2nd Stryker Brigade Combat Team, 2nd Infantry Division, at the National Training Center, Fort Irwin, California.

cyberspace operations forward, leaders must value empowerment, collaboration, and adaptability.

Good ideas are not reserved to a particular rank or stature. The "gardener" leadership direction McChrystal took relied on trust throughout the command and mirrored several tenets of mission command by recognizing the importance of empowering agile and adaptive leaders.[11]

Like a gardener, leaders can set the conditions by watering and weeding, but they cannot make the plant grow. Leaders must inspire creativity, idea generation and sharing, and initiative in their subordinates while encouraging them to take risks based on their ideas.[12] Leaders must avoid impediments to creativity simply out of fear of taking risks based on others' novel ideas. It is not enough for leaders to proclaim that the workforce should share ideas and not fear failure. Leaders must ensure that systems and resources are in place to enable idea sharing and to underwrite some failures.[13]

A crowdsourcing website together with challenge-based innovation offers a way to enable idea sharing. Members of a command can share and vote for ideas. Leadership can then select and implement those they deem likely to enhance operations. Leaders must be active participants. At U.S. Army Cyber Command and Second Army, crowdsourcing is one way to show innovation as congruent with the organization's mission. Team members are also able to pitch their ideas directly to the command's leadership through a *Shark Tank*-style resource-investment panel.[14]

While a need exists to take advantage of internal innovation, there is an equal requirement to look outward to build innovative proficiencies. There is a need to learn from others' innovation. The cyberspace community must continue developing relationships with academia and industry to expand innovation opportunities. We need these outside perspectives and partner activities as we continue to confront unforeseen challenges in cyberspace. The Army's proposed *engagement warfighting function* reinforces that future operational challenges are too numerous and complex for U.S military and civilian agencies to address alone.[15]

Government and industry are acknowledging the importance of Silicon Valley and the startup community in not going it alone. For example, the March 2016 appointment of Google Chief Executive Officer Eric Schmidt to head the Defense Innovation Advisory Board, the appointment of tech entrepreneur Chris Lynch to head the Pentagon's Defense Digital Service, and the establishment of DIUx coopt the talent and knowledge of Silicon Valley to serve the DOD.[16] U.S. Army Cyber Command

and Second Army launched the Silicon Valley Innovation Pilot program and participate in Stanford University's *Hacking4Defense* program.[17] Proctor and Gamble's Connect and Develop program offers an example from industry. That program allows the company to collaborate with organizations and individuals around the world to systematically search for technologies, packages, and products it can improve, scale up, and market on its own or together with other companies.[18]

Cyberspace's volatile nature and its rapid turnover of technology and practices require a flexible and adaptable cyber force. As the Army addresses ongoing and future operational challenges, cyberspace operations' role will increase at all levels of warfare. Cyberspace is becoming inextricably linked to land dominance. As evidenced in Ukraine, tactical applications of cyber effects will become the norm, with cyber capabilities integrating with maneuver and mission command. We must learn from ongoing conflicts that highlight the emerging challenges of cyberspace operations, information operations, and electronic warfare. We must then apply these lessons in our policies and doctrine, and at our combat training centers.

Many in industry, along with McChrystal, have learned the futility of five-year strategic plans in dynamic environments accentuated with uncertainty. To combat this, they seek adaptive advantage. Units such as the 780th Military Intelligence Brigade and the U.S. Army Cyber Protection Brigade—where teams are at the forefront of our ongoing cyberspace operations—are already making strides. Their continual integration into combat training center rotations is allowing cyber teams to act on change while experimenting rapidly not only with equipment and services but also with models, processes, and strategies.

The "cyber rifle" tool fabrication demonstrates that empowered individuals working collaboratively will find adaptable solutions to operational problems. Commanders must emplace a network of systems and processes to facilitate the ingenuity of these rapid innovations as they lead to adaptation. Organizing for adaptation is how we will take advantage of the emergent characteristics of cyberspace. Empowered cyber teams are the answer to adapting to this operational challenge.

Conclusion

The increasing overlap of information and operating environments requires the Army to rethink how it addresses innovation to address the Army's operational challenges. Paradigms are shifting. Future dominance on land depends largely on how successful we are in cyberspace operations. To ensure dominance, leaders must prioritize innovation and create the conditions where innovation can thrive. The Army must reframe how it leverages external innovation while also fostering the promise of internal innovators in the force. The Army must make these changes if we are to remain relevant and ready to face our adversaries in both the land and cyber domain. ■

Biographies

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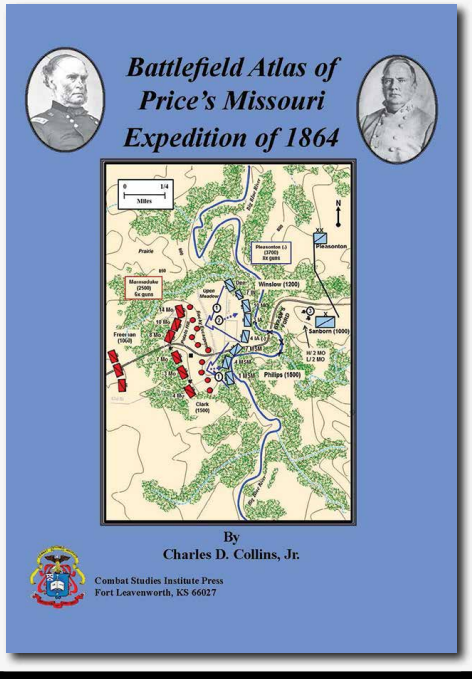

MR We Recommend

The Combat Studies Institute announces publication of *Battlefield Atlas of Price's Missouri Expedition of 1864* by Charles D. Collins Jr. It is a faithful rendering in maps of official records pertaining to the Price Expedition, the last great Confederate effort west of the Mississippi to turn the tide of the Civil War. However, it also incorporates original research that corrects some historical inaccuracies pertaining to the series of events in the expedition. As such, it is the best available tool to facilitate an understanding of the raid, especially as an aid for those who may have the opportunity to walk the ground of the major engagements.

http://usacac.army.mil/sites/default/files/documents/cace/CSI/CSIPubs/Prices_Missouri_Expedition_web.pdf

Colombia and the War-to-Peace Transition

Cautionary Lessons from Other Cases

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In 1948, Colombia entered a period of civil war from which it has never fully emerged. Since 1964, a key contributor to the violence has been the *Fuerzas Armadas Revolucionarias de Colombia* (Revolutionary Armed Forces of Colombia, or FARC). Although motivated originally by high levels of inequality between rich and poor, and guided strategically by Marxist-Leninist ideology and people's war theory, FARC's struggle evolved over several decades to increasingly emphasize drug trafficking and violence against the people. Due to various missteps and missed opportunities by the government, the group grew in strength, reaching its peak during the first years of the presidency of Andrés Pastrana (1998–2002). Thereafter, it declined precipitously as it was mauled by the Colombian military during a national resurgence that reached its peak in the course of the initial administration of President Álvaro Uribe (2002–2006) and continued in the second Uribe administration (2006–2010).

President Juan Manuel Santos (2010–2014) had initially pledged to continue Uribe's policies, but instead he startled all with a commitment to an open-ended peace process that continues to this day. Santos was narrowly re-elected to a second term (2014–2018) but now finds himself faced with the stubborn refusal of FARC to commit definitively to ending the conflict. This has placed the increasingly unpopular Santos administration in the awkward position of needing a deal at all costs, yet one that will retain legitimacy with a people skeptical about FARC's intentions.

The skepticism is warranted. While there have been many claims of irreversible progress in the talks, progress on substantive issues remains limited, not least on the actual demobilization of FARC as an armed organization and its integration into the nonviolent political process. This deadlock is not surprising: after years of decline, FARC's leadership appears to have realized that their armed struggle had no prospects of success. As part of its revised emphasis on the political aspects of the struggle, it conditionally accepted new peace talks but remained determined to obtain as much advantage as possible by exploiting the government's eagerness to seal a deal.

Specifically, FARC's proposals reflect three objectives: a desperate attempt to gain legitimacy before the Colombian people and the international community; to

(Photo by Luis Acosta, Agence France-Presse)

Revolutionary Armed Forces of Colombia (FARC) guerrillas listen during a class on the peace process between the Colombian government and their force 18 February 2016 at a camp in the Colombian mountains.

be given *de facto* (if not *de jure*) political and geographic control over various areas and populations, particularly over important rural regions in the southern part of the country where it has long been active; and to have a constitutional convention called with sectoral representation (ideally with FARC having reserved seats). By satisfying these goals, FARC leaders think they will have better chances to gain political power through elections so as to change the nature of the state—the goal being to turn Colombia into a socialist polity resembling the Bolivarian Republic of Venezuela. FARC leadership has not abandoned its Marxist-Leninist goals, only cloaked its ideology with language appropriate for the twenty-first century.[1]

In its effort to recast its struggle, FARC has claimed throughout the talks that the inequities and brutality of the state compelled it to wage its insurgency. It purports to speak for a broad social base and simply denies the extent to which it has, for decades, espoused assault on the innocent as its principal methodology for waging war. There is no crime that it has not committed: from torture and murder, to laying extensive (and normally unmarked) minefields throughout the country, to kidnapping and rape, to drug trafficking and extortion.[2] All these crimes it refutes, insisting instead that the facts of history be decided by various truth commissions and international panels. Against all polling and public expressions of support, the state is to be made the enemy of the people.

Because of the long duration of the negotiations and the excessively high hopes raised by the prospect of peace, the government finds itself in the position of being gradually made to give way. The backdrop for peace talks is anything but auspicious, but most analysts agree that some form of agreement will be signed in 2016—a forecast that is reflexively celebrated because of its seeming promise of Chamberlain-like "peace in our time." Needed is a deeper appreciation of history, particularly concerning war-to-peace transitions, as the record in comparable settings (such as Sri

Lanka, Nepal, and El Salvador) raises difficult questions regarding Colombia's way ahead.

Peace as a Continuation of War

All capable insurgent groups understand that the use of force—or violence—is only strategically relevant in so far as it creates political space and influence. These goals can equally be obtained through other ways, such as the exploitation of negotiation to achieve protection, immunity, or political concessions incommensurate with a group's military achievements and social standing.

The approach can be seen most forcefully in the conflict between the Liberation Tigers of Tamil Eelam (LTTE) and the Sri Lankan government, which involved four periods of negotiation, all mediated by foreign powers, and all deeply problematic in implementation and intent, certainly on the part of LTTE. During the final truce, initiated by LTTE in February 2002, it used the restrictions on Sri Lankan security forces to move aggressively into Tamil areas from which it had previously been denied.[3] In October 2003, LTTE issued a proposal, *Interim Self-Governing Authority* (ISGA), which would have pushed beyond de facto realities to make it the de jure power in the Northern and Eastern Provinces.[4] Following the devastating 26 December 2004 Indian Ocean tsunami, the ISGA proposal took on all the trappings of statehood, as the LTTE sought to channel the international aid pouring in to Sri Lanka through its own counterstate bureaucracy.[5] Throughout, psychological operations targeting the state continued, all while LTTE used the cease-fire as cover to eliminate those who stood in its way, including the Sri Lankan foreign minister and literally hundreds of Tamil politicians and activists.

The point is that LTTE remained committed to war, whatever the verbiage connected with the peace process. In his annual 27 November 2005 speech, delivered on LTTE Heroes Day, "President and Prime Minister of Eelam" (as Tamil media billed him) Velupillai Prabhakaran warned that LTTE intended to renew hostilities if the government made no tangible moves toward peace.[6] At the same time, prominent LTTE suicide attacks, including an attempted assassination of the commander of the Sri Lankan Army Lt. Gen. Sarath Fonseka, and the successful targeting of the army number three, pushed the situation beyond redemption. Still grasping for an ever-more unlikely diplomatic victory, Norway—the lead facilitator of the attempted settlement—made last-gasp efforts at mediation that predictably faltered. As violence increased, suicide attacks hit even targets in the deep south of Sri Lanka, and by August 2006, the country was again at war.

Colombia should be familiar with the strategy employed by LTTE. Peace negotiations have been attempted several times prior to the present round, most recently during the Pastrana administration, but these always came to naught. To break with "repression" and pursue peace, Pastrana complemented negotiations with excursion tours for FARC leaders to meet with European officials, particularly those of social-democratic persuasion, so the FARC leaders would see and hear for themselves how such regimes functioned in the modern political world. It was hoped that such visits would speak to FARC's own revolutionary aspirations and inspire peaceful mediation of grievances. FARC nominally accepted the government's gesture but pushed it further—it demanded the establishment of a *zona de distensión* (demilitarized zone, or *zona*). The government yielded to FARC control over an area the size of Switzerland and a population of some one hundred thousand. In reality, FARC's intent was to buy time to prepare for its "final offensive." As amply documented by Colombian intelligence, it utilized its trips abroad to make new contacts and open new routes for its narcotics shipments. Its zona became an unassailable staging ground for further criminal enterprise and attacks.[7]

After more than three years of negotiations, Pastrana and his advisers were no closer to peace. FARC leaders continually introduced new issues and allegations that were disruptive and counterproductive to actual progress. The point, of course, was to prolong the process and allow the movement to reorganize and strengthen its military capabilities, as well as to expand its involvement in the drug cycle. In one of his last official acts, Pastrana ordered the military to reoccupy the zona. By this time, however, and in spite of ongoing military operations, major FARC forces were deployed even around Bogota, the capital, blockading the most important national highways and stifling trade and travel. Steep rises in crimes, such as kidnapping and drug trafficking, led to increased fear and even panic, as there was a sense that FARC was the most powerful organization in Colombia.

(Photo by Luis Acosta, Agence France Presse)

Cuban President Raul Castro (center) oversees a handshake between Colombian President Juan Manuel Santos (left) and FARC leader Timoleón Jiménez (right) regarding an agreement in principle to negotiate an end to the FARC insurgency at a meeting held in Cuba, September 2015.

Is there a chance that the current negotiations, now four years old, are also a ruse? The FARC leadership, through its secretariat (also known as the Central High Command), is experienced and deft in managing, or distorting, perceptions. Nevertheless, evidence strongly suggests that FARC's objective, to which all FARC activity is directed, remains ideologically and politically to seize state power. For many years, FARC leaders thought this goal could be reached only through force and a protracted guerrilla war funded through criminality, particularly the drug trade—a connection, it is worth noting, that FARC continues to deny.[8] Yet, following its military defeat during the Uribe years, FARC's approach shifted to the nonkinetic and focused upon altering the frame and narrative of their fight through information warfare, simultaneously recruiting Lenin's "useful idiots" in promising Colombian sectors: coca growers, marginalized members of organized labor, and alienated left-wing elements such as radical professors and students.[9] Externally, the movement established reasonably secure bases in Venezuela and Ecuador so that FARC could survive no matter what blows it suffered on its own soil.

This has remained the FARC strategy and raises questions about the organization's nature and goals. What, for instance, motivates FARC's strict demand for several "peace zones" (it has asked for as many as eighty), ostensibly disarmament zones, but where the group will dominate until it volunteers to give up its arms? Similarly, FARC has negotiated an end to aerial and even manual eradication of coca crops, which is now to be undertaken by local communities, but only if the provision of services by an increasingly cash-strapped government is deemed sufficient. In the meantime, coca cultivation is skyrocketing, replenishing FARC's coffers after years of punishing counterinsurgency operations. Finally, the truth and reconciliation process promises to shield most FARC leaders from prosecution; so long as they admit to their crimes, the agreement merely enforces various restrictions of liberty short of jail time. It is difficult not to see the ongoing peace talks as "war by other means," allowing a group the

(Photo courtesy of Ingmar Zahorsky, Flickr)

Maoists from Nepal's Young Communist League rally against the government of Prime Minister Madhav Kumar Nepal 11 September 2009 in Kathmandu, Nepal. The first Maoist government had collapsed just a few months prior as the president had refused to dismiss the army chief over a dispute.

gains that were militarily beyond its reach. In such a context, what is peace?

The case of Nepal offers a cautionary and relevant tale. The "people's war" waged by the Communist Party of Nepal (Maoist) is normally associated with only the 1996–2006 period of overt hostilities. Since then, Nepal has been technically at peace. This though is a false dichotomy because what has occurred in Nepal since 2006 offers a significant illustration of the changing character of insurgency, particularly as it concerns the use of terrorism across the phases of war and peace.

Though they ostensibly reintegrated into normal politics following the ceasefire and comprehensive peace accord of 2006, the Maoists continued to state (publicly and in their private sessions) that they were involved in an armed revolutionary struggle strategically and were only proceeding by a different path tactically (i.e., political struggle).[10] They moved aggressively to use covert violence—terrorism carried out against local political opponents—as opposed to overt guerrilla warfare to solidify their position and win parliamentary votes. They used specially constituted forces, notably the paramilitary Young Communist League (YCL)—comprised overwhelmingly of combatants who were transferred and "reflagged"—to carry out these attacks.[11]

The Maoists were effective to the point that they were able to control elections and twice held the prime ministership, which allowed their party to neutralize still further remaining resistance within the demoralized security forces and to expand its influence and solidify its finances. Although statistics have not been officially tabulated, the numbers of victims for the period of "peace" appears to be in the thousands, most assaulted as opposed to killed.[12] There is little an anti-Maoist citizen can do or expect by way of protection of his or her person and property. The state displays either indifference or incapacity to popular security needs, but Nepal is, officially, at peace.

Translating Military Gains into Political Settlement

On the topic of peace, St Augustine wrote, "There is no one who does not love peace … It is for the sake of peace that men wage wars and even brigands seek to keep the peace with their comrades."[13] The implications for Colombia are obvious. An ambiguous term, "peace"

(Photo courtesy of Wikimedia Commons)

A Maoist slogan in Kathmandu, Nepal, just opposite the U.S. embassy. The first line reads "Long live MA[rx]LE[nin]MA[o]ism and Prachanda Path."

is not inherently auspicious. To be celebrated, it must do more than provide illegitimate organizations a path to unobstructed power. Tactically, some predatory actors may need incentives not to spoil the peace, but strategically, peace must reflect a commitment to higher ideals, benefiting the political system more than its most violent players. This in turn requires a common vision of the country's future, one that can bridge ideological divides and bring warring elites together. It is questionable whether Colombia has reached this point, not least because of the uncompromisingly revolutionary ideology underpinning the FARC struggle and its duplicitous strategic approach.

In El Salvador, it took a decade of conflict and fundamental political shifts to unite the Farabundo Martí National Liberation Front (FMLN) and the government in the quest for peace. Following the outbreak of war in 1981, the two sides met first in 1984, and again in September 1989, to discuss peace. Both times, too much distance separated the two sides, and neither felt militarily compelled to compromise. In La Palma in 1984, FMLN pointedly reminded the government that they still "maintain[ed] control of a third of a national territory (sic), ha[d] significant popular support in the cities and the countryside, maintain[ed] their own armed forces, and enjoy[ed] important support and recognition from the international community."[14] Confident, FMLN posited inclusion in the government as a precondition for peace, something that would have invalidated the elections of the previous year and the freshly penned constitution. The talks collapsed, and positions on both sides hardened.

The government also did not pursue talks with much commitment. The Reagan administration was ideologically opposed to accommodating FMLN, and, regardless, the Salvadoran elite was never compelled to support the reforms needed to get FMLN off the battlefield. In part, this was rooted in an unwillingness to amend the recently altered constitution, but it related also to the U.S. and Salvadoran governments' faith in an eventual victory. For both the White House and San Salvador, attrition was deemed preferable to change, if only to deny FMLN an opportunity to regenerate.

What allowed for productive talks were various local and international developments, for example, the end of the Cold War threatened FMLN's funds and compelled the United States to push for a negotiated settlement so as to extricate itself from a suddenly far less urgent conflict.[15] Reacting to these shifts, FMLN in 1989 dropped its demands for transitional power sharing and integration into the army, but it still insisted that talks precede a cease-fire and that the elections, planned for later that year, be postponed to aid FMLN's participation. The government balked, dismissing FMLN as "a small reality [that] cannot oblige the government to change the republic's constitutional system."[16] FMLN was also not willing to yield: "We are flexible," a spokesman said, "but they are making a mistake if they think we are negotiating from weakness."[17]

In the end, it took an embarrassingly high-profile human-rights scandal by the El Salvadoran military and a failed but symbolically potent FMLN offensive into the capital, San Salvador, to make the stalemate sufficiently painful for both sides to compel compromise. FMLN had to accept that the country's democratic parameters were immutable, and the government that constitutional reforms were necessary to depoliticize the military, reform the police, and investigate wartime abuses. Compromises such as these were possible because both sides now shared a vision of the future that was preferable to continued fighting, and therefore committed themselves to the agreements necessary for its actualization.

It is questionable whether the present situation in Colombia has reached this point. Although Uribe's Democratic Security Policy inflicted severe losses on FARC—one may speak of decimation—the government failed to translate the military advantage into unambiguous bargaining power.[18] FARC therefore persists with its project, and the Santos government, having squandered its advantage, appears powerless to set the terms necessary to move forward. If anything, FARC is now empowered by Colombia's strong security sector, as it uses the internationally resonant language of human rights and government repression to offset its profound military weakness and negotiate from a position of strength.

Thus, harking back to the violent targeting of its surrogate party, the Patriotic Union, in the 1980s, FARC now insists on retaining its weapons in the peace zones that it will then control and the military will be restricted from entering. Whereas allegations of government repression certainly were fitting in earlier phases of Colombia's conflict, and there have been

abuses in the recent past, this rhetoric appears far more instrumental than earnest, producing strategic advantage rather than needed protection.

Indeed, when evidence emerged of FARC organizing armed political rallies in the peace zones and the government sought to prohibit such activity, FARC objected that the government was changing the terms of the agreement and was "basically seeking a surrender."[19] Again the government had to retreat. Surrender may indeed have been the preferred conclusion of the Democratic Security Policy, given FARC's military-weakened position at the time and its lack of resonance in Colombian society, and yet—much as the United States and its NATO allies experienced in Iraq, Afghanistan, and Libya—translating military gains into political victories proved far too challenging. In this, lack of will and misguided assessment by the Santos government certainly played a key role.

This point raises another difference between El Salvador and Colombia. In El Salvador, FMLN emerged as the main opposition party in the very first elections that followed the war-to-peace transition, reflecting its support across Salvadoran society. As a former FMLN commander explained, even though its party came in a distant second, it felt empowered by the support and able from this new position to effect political change, obviating further conflict.[20]

In contrast, FARC has very little public support. In an August 2015 poll, more than 90 percent of respondents indicated FARC leadership should go to jail.[21] Mass rallies have denounced FARC, and its *unfavorable* rating since 1998 has seldom slipped below 90 percent and has often been higher.[22] Whereas by 1989 in El Salvador, 83 percent of the Salvadoran population wanted a negotiated settlement, in Colombia, only 57 percent of the country would vote "yes" in a hypothetical plebiscite on the FARC peace accord; 33 percent are opposed.[23]

Given FARC's lack of support and legitimacy, coupled with its much diminished military position, negotiations as equals was never the optimal framework for peace making in Colombia. This forces the question of what a military and political defeat of FARC would have required.

(Photo by Rodrigo Abd, Associated Press)

Members of the 36th Front of the FARC trek to a new camp in Department of Antioquia, in the northwest Andes of Colombia, 6 January 2016. Big guerrilla camps are a thing of the past; the rebels now move in smaller groups. The 36th Front is comprised of twenty-two rank and file fighters, four commanders, and two dogs. Constant military, social, and political pressure by the Colombian government on FARC for more than a decade, together with loss of covert support from Venezuela, has greatly reduced the geographic scope of FARC influence.

Sri Lanka again provides precedents, given its total military and political defeat of both the LTTE and of Janathā Vimukthi Peramuna (JVP), a Maoist insurgent group. First, in its design and execution, a military victory must avoid offering the defeated threat group precisely the type of support (particularly international support) that it so sorely lacked beforehand and that may help it offset its military losses. In the case of the

(Photo courtesy of Chamal Pathirana, Wikimedia Commons)

Sri Lankan soldiers carry their unit flags 19 May 2012 during the annual parade in Colombo, Sri Lanka, marking the anniversary of the civil war victory over Tamil Tiger rebels.

final confrontation with LTTE from 2006 to 2009, the lethality and manner of execution by the Sri Lankan armed forces sowed the seeds for a longer-term contestation of government legitimacy and raised red flags across the West as to the need for concessions and compromise. Even as it was losing militarily, LTTE was given a leg up in terms of international legitimacy, which may well fuel a further round of violence in the future. While international pressures have abated following the unexpected change of government in 2015, the question remains whether the narrative of genocide in Sri Lanka can yet provide LTTE or a successor organization a fresh lease of life.

Second, a total military victory would not—and indeed should not—preclude the types of reforms necessary to address the sources of alienation and drivers of violence. The key, however, is that such reforms are undertaken in a manner benefiting not the armed group but the people that it claims to represent. The question for Sri Lanka, therefore, is whether its government has done enough, in the aftermath of LTTE's military defeat, to co-opt a Tamil population and to avoid a re-emergence of armed mobilization as a means to redress grievances in a closed political opportunity structure.

Sri Lanka's crushing of the JVP in 1971 provides a cautionary precursor, given the resurgence of that group and the launch of a far more potent insurgency in 1987. Similarly, Syria's crushing of the Muslim Brotherhood, thought disturbingly conclusive, also produced over time a renewed and far more intractable insurgency, involving many of the same communities and some of the same organizations that were supposedly crushed in 1982.[24] Military victory does not obviate the requirement for reform.

In Colombia, the government neither completed its military victory nor inflicted sufficient harm to produce a definitive balance of power in the attendant negotiations. The concessions that it has made since then, perversely, have largely benefited FARC rather than the people, whose link to the government (i.e., legitimacy) constitutes the center of gravity of almost all irregular confrontations of this type and whose grievances have remained more or less unchanged and may, during peace, grow worse. Tellingly, the inhabitants of FARC's new peace zones were never consulted as their community was given, like political fodder, to the narco-traffickers now in charge.

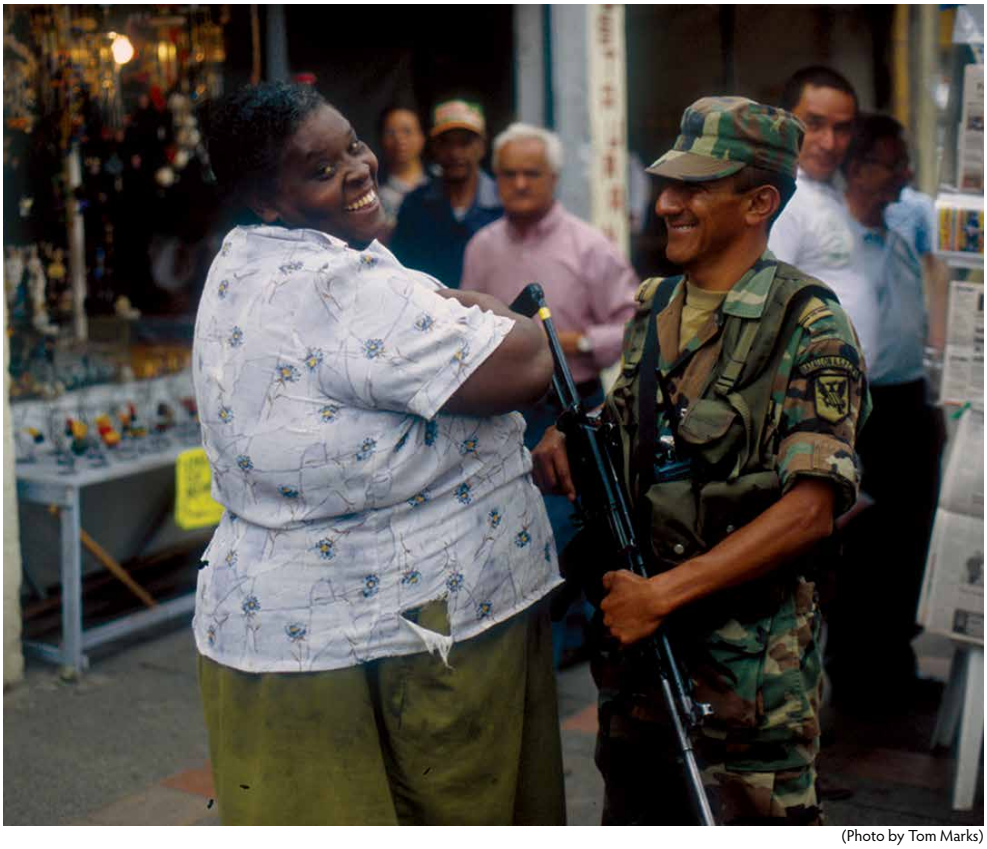
Vulnerabilities of a Postconflict Society

This brings us to a final consideration. Even if the negotiations with FARC succeed in achieving a compromise that results in the formal termination of conflict, the historical record reveals several reasons to worry about the fate of postconflict Colombia. First, postconflict societies are in most cases fragile and violent—often more so than during the final years of conflict.[25] Where peace agreements are signed, the state is asked to undergo deep-rooted political and economic reforms even while maintaining public order in a society traumatized and powerfully shaped by violence. New or mutated sources of instability must be carefully managed, and public security must be

maintained, if not by local forces then by competent and numerically adequate outsiders.

In El Salvador, an admixture of desperation, opportunism, and revanchism fueled a postconflict crime wave that brought death tolls greater than the average war year and contributed to long-term social and economic dislocation.[26] Amid the enthusiasm for peace, a disarmament and demobilization program overseen by the United Nations (UN) dismantled the coercive capacity of the state and rebel forces, resulting in a power vacuum at an acutely fragile moment, particularly as the creation of new forces, predictably, became a drawn-out and complex affair.[27] Because the UN operation was also not mandated, tasked, or structured to provide public security, there were in effect no forces present to check the mounting crime wave. While the criminality did not trigger renewed war, its effects—violence, gangs, and government illegitimacy—haunt El Salvador, and the region, to this day.

A lack of postconflict security was seen also in Guatemala and Panama, the Democratic Republic of the Congo, and more recently, in Afghanistan, Iraq, and Libya. Indeed, the transmutation of forms and types of violence following the formal conclusion of war is a typical peacebuilding challenge. This risk is particularly high in Colombia. Homicide rates have fallen to record lows, and incidents between FARC and the government have virtually ceased since July 2015. Yet coca plantations are growing, reflecting a surging illicit economy underpinned by violence. As Adam Isacson and Gimena Sánchez-Garzoli note, "The U.S. government measured 159,000 hectares (613 square miles) of territory planted with coca bushes in 2015, the third-highest annual amount ever."[28] New paramilitary groups are also increasing their activity, capitalizing on the gaps left by FARC and the government. Isacson and Sánchez-Garzoli note a "terrifying spike" in the month of March against human rights defenders, most of them in rural zones and urban areas where the state's presence is weak.[29]



(Photo by Tom Marks)

A Colombian military urban patrol member interacts with the populace in Pereira, Department of Risaralda, Colombia, September 2003.

Meanwhile, *Ejército de Liberación Nacional* (ELN), a smaller but nonetheless significant Colombian guerrilla group, has, despite engaging in peace talks with the government, also carried out more attacks of late and "appears to be increasing its presence in zones of FARC influence."[30] FARC points to these developments when it insists on retaining its weapons during and after the peace agreement, so as to ensure its protection, but for the same reason it also expects the military to transition from counterinsurgency to external threats—to adopt the role it would play in a safe and secure democracy. The convergence of risk factors and security sector reform may produce a perfect storm of insecurity and violence, all in a time of peace.

(Photo by Navesh Chitraka, Reuters)

Supporters of Federal Alliance, a coalition of Madhes-based parties and other ethnic political parties and organizations, protest against the constitution near the Singha Durbar office complex that houses the prime minister's office and other ministries 15 May 2016 in Kathmandu, Nepal.

Despite the historically consistent trend of increased violence following conflict termination, inflated expectations of peace often bring rushed measures intended to revitalize the economy. Given the unique vulnerabilities of a postwar society, such efforts are typically counterproductive, and their ill effects tend to be felt particularly by those most likely to remobilize against the state or resort to criminal enterprise to make ends meet.

In El Salvador, the government quickly embarked on structural adjustments to modernize its economy in line with the prevalent market principles of growth and development. Though its gross domestic product (GDP) increased threefold between 1986 and 1994, poverty levels rose and economic inequality worsened. Underestimated at the time was the economic dislocation of the country and the need for longer-term government-led reconstruction and rehabilitation—socially and economically—to heal the wounds of protracted war and preclude the type of societal bifurcation that had spawned conflict in the first place.

Instead, encouraged by the international financial institutions, El Salvador harmed a very vulnerable population at a highly combustible time. While war has not resumed, the failure to manage postconflict vulnerabilities has contributed to the rise of new sources of instability: further disintegration of the Salvadoran society, destruction of property, government illegitimacy, uncontrolled migration, and the rise of gang structures and violent crime.

As Mats Berdal has found, "the formal end of armed conflict, especially if reached through a negotiated settlement, rarely entails a clean break from past patterns of violence, nor does it mean that the grievances which gave rise to conflict in the first instance have been entirely removed."[31] In Colombia, the talks have focused heavily on what concessions to offer FARC, but the populations on which it has preyed continue to struggle and are unlikely to be adequately cared for by the state. Given Colombia's current economic slump, the government may very well prove unable to reach and incorporate critical

communities in a manner that inures them from violent alternatives.[32]

This matters, as it was precisely the government relation to its people that underpinned the Democratic Security Policy. Locating government legitimacy as its center of gravity, the counterinsurgency campaign extended the state to long-neglected communities, through the imposition of a war tax upon the well-off, socioeconomic opportunities, and creation of more societal and geographic inclusion than Colombia had ever known historically.[33] From 2002 to 2010, the years of the Democratic Security Policy, average economic growth, per capita GDP, and health coverage doubled, all while poverty rates decreased from 53 percent to 37 percent, and inflation from 6.9 percent to 2.5 percent.

In contrast, in March 2016 inflation hit 8 percent, its highest level since October 2001. Foreign direct investment has continued despite currency fluctuations but benefits mostly those areas where business is already deemed attractive. Meanwhile, Colombia's *gini* coefficient—a measure of income inequality—remains the second worst regionally, despite some improvement in recent years.[34]

The economic insecurity of Colombia today, and the added sources of instability typical of a postconflict society, look likely to produce a mass of dispossessed and marginalized communities, forced either to embrace crime as a way of life or susceptible, at the very least, to FARC influence in a future electoral contest (particularly where these populations reside in or near one of the peace zones). Given Santos's own unpopularity, a change in government may be just what Colombia needs, but FARC looks more likely to exploit rather than address the country's continued grievances.[35]

Indeed, FARC has demonstrated a growing awareness of the security and economic vacuum created by the state's failure to sustain the democratic mobilization that typified Uribe's first term. FARC has thus dramatically increased its efforts to mobilize *cocaleros* (cultivators of coca), marginalized indigenous elements, and the extreme left wing of labor and of the political spectrum (e.g., students). These efforts, accompanied by a robust information warfare campaign, have allowed FARC to interject itself into national politics in the same manner as Hezbollah or the Nepali Maoists—or any other political party that also fields its own armed forces. The future of Colombia's long-standing democratic tradition is at risk. ■

Biographies

Gen. Carlos A. Ospina, National Army of Colombia, retired, is a distinguished professor of practice at the College of International Security Affairs, National Defense University. A former commander of the Colombian Armed Forces and the National Army of Colombia, he organized the Commando Battalion and the Lancero unit—key units that dealt FARC severe blows late in the conflict. He is the author of A la Cima sobre los hombros del Diablo, Los años en que Colombia recupero la esperanza, *and* Batallas no contadas.

Thomas A. Marks, PhD, is distinguished professor of irregular warfighting strategy at the College of International Security Affairs (CISA), National Defense University (NDU). He holds a BS in engineering from the United States Military Academy, MA degrees in history and political science from the University of Hawaii at Manoa, and a PhD in political science from that university. A former military officer, he has an extensive analytical and operational background, and for the past twelve years has been chair of the War and Conflict Studies Department at CISA.

David H. Ucko, PhD, is an associate professor at the College of International Security Affairs, National Defense University. He holds a PhD from the Department of War Studies, King's College, London. He is the author of Counterinsurgency in Crisis: Britain and the Challenges of Modern Warfare *and* The New Counterinsurgency Era: Transforming the U.S. Military for Modern Wars, *and co-editor of* Reintegrating Armed Groups after Conflict.

Notes

1. Nothing in such an assessment of FARC need be treated as mere opinion. Anyone may access the group's extensive online presence and that of its fellow travelers. Indeed, FARC essentially boasts of its Cold War approach. See, for example, Fuerzas Armadas Revolucionarias de Colombia-Ejército del Pueblo (FARC-EP), the official FARC website, accessed 10 May 2016, http://farc-ep.co/.

2. Ministerio de Defensa Nacional, *Sobreviviendo al Infierno: Las FARC Desde Adentro* [*Surviving Hell: Inside the FARC*], (Bogotá: MINDEFENSA, 2015), accessed 10 May 2016, https://www.mindefensa.gov.co/irj/go/km/docs/Mindefensa/Documentos/descargas/Prensa/Documentos/SobreviviendoAlInfierno.pdf. This report contains twenty testimonies of former FARC members.

3. One of the best treatments of this period is G.H. Peiris, *Twilight of the Tigers: Peace Efforts and Power Struggles in Sri Lanka* (New Delhi: Oxford University Press, 2009).

4. "LTTE's Proposals for an Interim Self-Governing Authority in the Northeast Region of Sri Lanka," South Asia Terrorism Portal, 1 November 2003, accessed 10 May 2016, http://www.satp.org/satporgtp/countries/shrilanka/document/papers/LTTE_northeast.htm.

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10. "Baburam Bhattarai: On Nepal's Social Revolution," interview by World People's Resistance Movement, 12 December 2009, The Marxist-Leninist website, accessed 10 May 2016, https://marxistleninist.wordpress.com/2009/12/12/baburam-bhattarai-on-nepals-social-revolution/. A particularly useful explanation for the change may be found in the lengthy interview given to World People's Resistance Movement (Britain) by the Maoists' then-chief ideologue and "Number Two," Dr. Baburam Bhattarai, wherein he stated directly that all accommodation was tactical for the strategic pursuit of power. The Party leadership repeated this same position in November 2010 at the Maoist Sixth Plenum—well after "peace" agreements had been signed—and has more recently been reiterated in the bitter Central Committee/Politburo debates of January 2012. In the latter, intraparty agreement was reached to use "revolt" (i.e., urban insurrection) if the stubborn rival parties did not give in to Maoist demands concerning the shape of the "new order."

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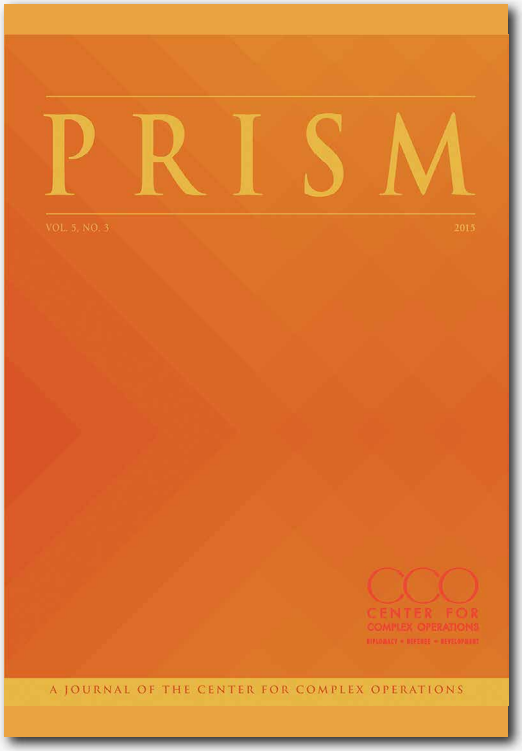
MR We Recommend

For those interested in reading more background and analysis of a potential peace settlement to Colombia's long-standing Marxist insurgency, your attention is invited to the displayed article published in Vol.5, No. 3 (2015) of *PRISM*, a publication of the Center for Complex Operations. http://cco.ndu.edu/Portals/96/Documents/prism/prism_5-3/Prism%20Vol%205%20No%203.pdf



Colombia

A Political Economy of War to an Inclusive Peace

BY DAVID KILCULLEN & GREG MILLS

Such progress has been made in Colombia that it is hard to remember that only 20 years ago, the country was renowned not for its practical people or its wonderful cities and rainforests, but for its cocaine-fuelled murder rate. At the height of the drug war in the 1990s, Colombians suffered ten kidnappings a day, 75 political assassinations a week, and 36,000 murders a year (fifteen times the rate in the United States).[1] The military and police competed with an array of guerrillas, gangs, *narcos* and paramilitaries. Guerrillas had so isolated the largest cities that urban-dwellers traveling as little as five miles out of town risked kidnapping, or worse. Twenty-seven thousand two hundred thirteen people died in 1997-2001 alone.[2] Colombia entered the 21st century at risk of becoming a failed state. Since then, national leaders have turned the situation around, applying a well-designed strategy with growing public and international support. Kidnappings, murders and cocaine cultivation are down, government control has expanded, and the economy is recovering. Talks in Havana, Cuba, offer the hope of peace, even as fighting continues on the ground in key areas. But the situation is shakier than it seems—indeed the very success of Colombia's current campaign carries the risk of future conflict.

In this paper, which draws on fieldwork in Colombia between March 2009 and August 2014, we examine Colombia's turnaround, explore current issues, and offer insights for the future and for others facing similar challenges. We consider the conflict's political economy, by which we mean the dynamic social-political-economic system that frames people's choices within incentive structures created by two generations of war. Our key finding is that, with some significant exceptions, key commanders of the Revolutionary Armed Forces of Colombia (known widely by their Spanish acronym, FARC) and others have become what we call "conflict entrepreneurs," seeking to perpetuate war for personal gain rather than to win (and thereby end) the conflict. Therefore, remarkable as it is, today's military progress won't be enough to end the war in a way that guarantees Colombia's peaceful future. We argue that a comprehensive conflict transformation is

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Commanding General of the [Brazilian] Army Denies Possibility of Military Intervention

Heloisa Cristaldo, Agência Brasil, Reporter

Editor's Note: *Until fairly recently, one of the historic recurring features of many countries in Latin America has been the tendency for the military to seize power and establish military dictatorships during periods of perceived instability and unrest, unfortunately often aided and abetted by the United States for its own political purposes. However, as the various nations have become more cosmopolitan in their global connections and matured their democratic institutions and economies, including the values and internal character values of the militaries themselves, military coups have largely become a thing of the past. Irrespective, during periods of rising domestic uncertainty in some countries, there are still voices that emerge calling for active military intervention into the province of civilian rule to ensure security, order, and calm. Recently, Brazil has been facing a tumultuous political crisis as many of its democratic institutions have coalesced around an effort to impeach and remove from office President Dilma Rousseff on charges of corruption and abuse of office. One result has been calls in some quarters of Brazilian society for the Brazilian military to seize power and prevent civil unrest as supporters of the president from potentially clashing with detractors demanding her removal. It is against this background that the recent comments of the current commander of the Brazilian Army, General Eduardo Villas Bôas, are salient. They may be a possible metric of how the region's militaries now perceive their role relative to the other institutions of democratic governance as compared to what the perceived role was in previous eras.*

The commanding general of the [Brazilian] Army, General Eduardo Villas Bôas, today (19 April 2016) rebutted the possibility of the Armed Forces intervening in the country as a result of the current political crisis. The declaration was made during a speech about Army Day, at the private university Centro Universitário de Brasília (UniCeub).

"The Armed Forces do not exist to watch over the government, nor to knock down governments. We have to contribute to the legitimacy of government, creating the conditions in which such institutions continue working and finding ways to overcome what we are experiencing. We have seen that the [political] clashes have been vicious, but the institutions are working", he said.

Villas Bôas stated that the military intervention of 1964 was an error of the Armed Forces. "Brazil from the 1930's to 1950 was the country that grew most in the world, with Getúlio [Vargas] and Juscelino [Kubistchek]. With the military governments of the 1970's and 1980's, we committed an error. We allowed the division of the Cold War to affect us, which resulted in our country that had come about with a sense of progress losing cohesion", he assessed.

The military overthrow of March 31, 1964, led Brazil to the Republic's longest period of interruption to demo-

(Photo by Tiago Corrêa - Dircom/ CMM [Diretoria de Comunicação - Câmara Municipal de Manaus])

Gen. Eduardo Dias da Costa Villas Bôas, commanding general of the Brazilian Army, meets with fellow officers and civilian staff on 26 March 2014.

cratic development. Remembered as "the years of lead", the period of the dictatorship was marked by the cancellation of civil rights, control of the press, violent repression of popular demonstrations, torture, and assassinations.

United to Get Out of the Crisis

With respect to current times, Villas Bôas exhorted national unification to confront the crisis. "We have to recuperate national cohesion, place the interests of the country, the nation, above all these squabbles that dominate the current day to day environment. Concerning 1964, there were two basic differences, first was the Cold War period, with extreme positions; and, in 1964, the country did not count on well established democratic institutions. Today, our country has developed institutions; institutions with weights and counterweights that remove the necessity of being supervised", the commanding general emphasized.

The general also denied rumors that President Dilma Rousseff considered decreeing a state of emergency in the country. "In Congress, some representatives spoke on this subject. On the president's part, there was no such initiative. It would be a comprehensive measure, but difficult to be implemented. With difficulty, she would be able to implement it, but it would create an extreme situation. It would impede demonstrations and would appoint the Army to be employed in activities where public forces are not able to do security", he explained.

In his closing comments, Villas Bôas said that it is necessary to find ways to overcome the country's political crisis. "We are sure that the society is capable of overcoming this crisis, which is of an economic, political and ethical nature. [However] we have seen that all the parameters are fading away and we are losing our ethical and esthetic references, and the discussions we see about finding ways to overcome the crisis worry me. These discussions do not have depth; they remain in the economic field. It worries me that deeper things—the [ethics at the] foundation of our country—are not being considered".

During the speech, the commanding general of the Army highlighted the performance of [Brazilian] military personnel in areas such as the Amazon and Haiti, in addition to the intellectual involvement of the force in solving questions of national security as well as contributions to the scientific and technological development of strategic projects. ■

(Photo courtesy of NATO Special Operations Headquarters)

NATO Special Operations Headquarters, Mons, Belgium, provides training for allied and partner special operations forces to improve their interoperability. The purpose is to create an international network of trained personnel who can respond to a range of scenarios that may arise simultaneously in multiple NATO nations.

NATO Special Operations Forces, Counterterrorism, and the Resurgence of Terrorism in Europe

1st Lt. Matthew E. Miller, U.S. Army Reserve

The rise of violent extremism and the recent terrorist attacks show we are dealing with a qualitatively new challenge.

—NATO Secretary General Jens Stoltenberg

The Islamic State (IS) has expanded into the realm of international terrorism, with the downing of a Russian airliner over the Sinai in October 2015, suicide bombings in Turkey in 2015 and 2016, and attacks in Paris in November 2015.[1] Consequently, North Atlantic Treaty Organization (NATO) member states, overwhelmed by the magnitude of a foreign-directed threat, could invoke Article 5 of the 1949 North Atlantic Treaty for collective defense in Europe.[2] Article 5 states that the signatories "agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all."[3] This principle of collective defense recognizes that terrorism is a threat to the NATO alliance.

(Image courtesy of NATO Special Operations Headquarters)

In the weeks that followed the 2015 attacks in Paris, there was significant discussion of whether France would invoke Article 5.[4] France chose not to. In fact, the al-Qaida attack against the United States on 11 September 2001 is the only case of an allied nation invoking Article 5 in an effort "to restore and maintain the security of the North Atlantic area."[5] In less than twenty-four hours following 9/11, the NATO alliance determined that the United States was the object of an armed attack and that the attack had been foreign directed. Subsequently, NATO assisted the United States with seven NATO airborne warning and control system aircraft, conducting more than 360 sorties in U.S. airspace as well as supporting maritime operations in the Mediterranean.[6]

Need for NATO Special Operations Forces

Notwithstanding a clear and demonstrated cross-border terrorist threat to NATO as a whole, whether through a failure of politics or a rejection of reality, counterterrorism (CT) is not yet a principal mission of NATO special operations forces (SOF). As a result, without a doctrinal CT mission, it is likely NATO SOF will formally, or informally, be supplanted by a member state's national SOF CT units in the event of a large-scale terror crisis, a much less effective approach to dealing with a collective problem. Consequently, in light of the rapid expansion of IS and the increasing threat of terrorism in Europe, it is time for NATO SOF to establish CT as a principal mission.

NATO's website makes it clear that NATO SOF are ready to deploy to Asia, Africa, or the Middle East, but it also acknowledges that its SOF may be required to operate in Europe as it adapts to new threats.[7] Although France chose not to invoke Article 5 in the latest terrorist event, it is not inconceivable that one or more member states that possess less robust SOF capability than France could be overwhelmed by a large-scale terrorist attack similar to 9/11 or, more likely, a series of complex attacks similar to the attacks in Mumbai and Paris.[8] Many of the NATO signatories that joined after the fall of the Soviet Union simply do not have the organic capability to deal with foreign-directed and well-resourced terror networks operating in or between European countries. Any member state with underdeveloped law enforcement CT or SOF CT capabilities is more likely to invoke Article 5, thus obliging allied nations to take "such actions, as it deems necessary" intended to "restore and maintain security."[9] Therefore, NATO SOF should be the NATO element capable of providing CT support to these younger member states.

On 29 September 2015, Hungary's prime minister warned that mass migration from countries such as Afghanistan, Syria, Iraq, and Libya risked destabilizing Europe.[10] Germany alone expected to receive eight hundred thousand to one million refugees by the end of 2015. Some of these are believed to have traveled on fake Syrian passports.[11] At least one of the Paris attackers from November 2015 was found to have traveled on such a passport, and Frontex (the European Union's border agency) has reported that a number of individuals have requested refugee status based on false Syrian citizenship.[12] The Danish General Intelligence and Security Service reported that in the first decade of the twenty-first century, terrorist groups such as al-Qaida are

(Photo by Peter Andrews, Reuters)

Polish special military force personnel from Grupa Reagowania Operacyjno-Manewrowego (Group [for] Operational Maneuvering Response, or GROM) secure hostages during hostage-rescue training 13 April 2012 as part of preparation for the UEFA Euro 2012 (European soccer championship) in Gdansk, Poland.

"stealthily taking root" in Europe.[13] These established terror networks in Europe will now have a new opportunity to recruit from this wave of mass migration from Syria and other parts the Middle East.

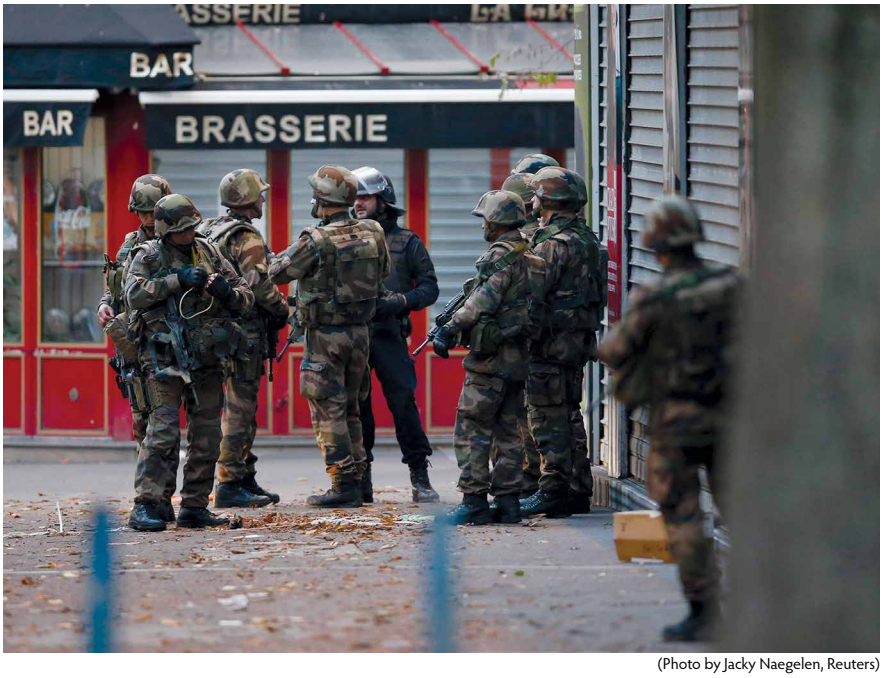
Islamic terrorism in Europe is often tied, directly or indirectly, to immigration and the challenges of societal integration or the rejection of assimilation, even in the second and third generations.[14] The 2015 refugee crisis has changed the threat of terrorism in Europe. First, terrorist organizations such as al-Qaida and IS will likely attempt to embed terror operatives among the legitimate refugee population for the purpose of conducting attacks or building a new cadre in Europe.[15] Second, former fighters fleeing or returning from the battlefields of the Middle East and North Africa will continue to pose a terror threat. Disillusionment in the reintegration process and the challenges of Western society could lead these combat-experienced individuals to radicalize and establish, or re-establish, previously held terror connections.[16] The third threat is the potential increase in second- and third-generation immigrants radicalized as independent cells or in concert with one of the other two previously discussed groups.[17] In light of the 2015 IS attacks in Paris and the mass migration of refugees from war-torn countries, it is time for the NATO SOF to adopt CT as a primary mission.

History of Counterterrorism Units

Historically, the establishment of national-level CT units and capabilities has always been driven by terror and crisis. The first impetus for the development of national-level CT capabilities in Europe was a response to an attack at the 1972 Summer Olympic Games in Munich, Germany. During the games, a Palestinian group called Black September entered the Olympic Village and subsequently kidnapped and killed several Israeli athletes. Amid the confusion and poorly managed law enforcement response, German police initiated a rescue attempt that ended in a catastrophic failure, with the deaths of nine Israeli athletes at the airport. None of the German police had training in hostage rescue, close-quarters combat, or sniping. Less than sixty days later, the German government formed the *Grenzschutzgruppe 9*

der Bundespolizei, or GSG-9, Germany's first dedicated CT unit.[18]

Shortly after what became known as the Munich Massacre and the establishment of the GSG-9, France followed suit with the creation of *Groupe d'Intervention de la Gendarmerie Nationale*, or GIGN.[19] A significant difference between the two organizations was GSG-9's status as a law enforcement organization and GIGN's position as a unit of the French Armed Forces. This is a significant distinction because there are NATO nations whose militaries may not be allowed to operate in a law-enforcement capacity, and other partner states that do not allow foreign militaries to operate within their borders. The legal distinction of NATO SOF in a member state's Article 5 response is beyond the scope of this discussion, but it is an important distinction if NATO adopts SOF CT capabilities and responsibilities as a principal mission.



(Photo by Jacky Naegelen, Reuters)

French soldiers secure the area where shots were exchanged five days earlier in Saint-Denis, France, near Paris, 18 November 2015, during an operation to catch fugitives responsible for the deadly attacks.

The United States chose to develop CT capabilities in both law enforcement and armed forces, but only after its own hostage crisis, the Hanafi Siege, 9–11 March 1977. Homegrown violent extremist (using the modern vernacular) and Muslim convert Hamaas Abdul Khaalis raised a group of twelve gunmen to lay siege to three buildings in Washington, D.C., holding 149 hostages for thirty-nine hours. Khaalis's group seized one floor of the John A. Wilson Building, the B'nai B'rith headquarters, and the Islamic Center of Washington, D.C. The gunmen made several demands that included the U.S. government handing over several men convicted of killing members of Khaalis's family and the destruction of all copies of the movie *Mohammed, Messenger of God*, starring Anthony Quinn, which they believed to be an affront to Islam.[20] The thirty-nine-hour siege ended without a significant loss of life. Of the 149 hostages, two died from gunshot wounds received in the initial attack, and the remaining hostages were released after negotiations led by Egyptian ambassadors.

During the siege, U.S. leadership called upon the Federal Bureau of Investigation (FBI) and the Department of Defense (DOD) for assistance with a potential hostage-rescue mission. Neither the FBI nor the DOD had units trained with the appropriate CT capabilities.[21] It had not been a priority in a Cold War military or in a domestic law enforcement community that believed terrorism was largely a European problem, but both the FBI and DOD would initiate efforts to develop significant CT capabilities within a year.

Each of these incidents represented a change in the national threat level, which required an increase in national CT capabilities; in turn, 2015 has seen a dramatic change in the European threat level. Transnational terrorism in Europe and the increased lethality of complex terrorist attacks should be the impetus for NATO SOF to adopt CT as a principal mission, before the formal request for collective defense arises.

NATO Special Operations Doctrine and Counterterrorism

With an increased likelihood of NATO SOF being called to support a member state's special forces CT element or law-enforcement CT unit, NATO needs to

determine the international coordination procedures for such actions at the interagency and interministerial levels. It was imperative to establish collective security arrangements for a CT response in advance of an Article 5 request due to the multinational nature of modern terrorism threats and the increasingly complex nature of the European security environment. This started in a general sense with the 2006 Riga Summit's decision to launch a SOF transformation initiative intended to increase interoperability and dialogue between NATO SOF units.[22]

"SOF should be utilized when there is high risk, a need for special capabilities, or requirements to conduct covert or clandestine operations." (NATO SOF doctrine)

As previously noted, NATO SOF doctrine does not hold CT as one of its three principal missions. The first NATO SOF doctrine publication, Allied Joint Publication (AJP)-3.5, *Allied Joint Doctrine for Special Operations*, identifies the three principal NATO SOF missions as military assistance, special reconnaissance, and direct action.[23] Surprisingly, AJP-3.5 only includes one paragraph dedicated to CT.[24] Ostensibly, NATO SOF CT doctrine amounts to four sentences taken directly from *NATO's Policy Guidelines on Counter-Terrorism*.[25] In comparison, AJP-3.5's "Record of Specific Reservations," which essentially notes disagreements on the use of joint-doctrine terms by partner nations, is a full page and a half.[26] AJP-3.5 does acknowledge that special operations can take place as "part of Article 5 collective defense or non-Article 5 crisis response operations to fulfill NATO's three essential core tasks (collective defense, crisis management, and cooperative security)," but it does not define any CT focus.[27] It is self-evident that any of the three NATO SOF principal missions could support or include a CT mission, but that is not sufficient for the current (and increasing) threat. In the modern threat environment, CT needs to be a priority of NATO SOF. It is unlikely the NATO leadership had a direct-action raid against an IS cell in a suburb of a European capital in mind when AJP-3.5 was drafted, but it is becoming increasingly likely that NATO SOF could support such a mission.

NATO SOF doctrine does state that NATO "SOF should be utilized when there is high risk, a need for special capabilities, or requirements to conduct covert or clandestine operations."[28] Take the case of the 2004 Madrid train bombing, in which 191 were killed and 1,800 were wounded.[29] The investigation led Spanish authorities to an apartment building in the Leganes neighborhood of Madrid. On 3 April 2004, the Spanish *Grupo Especial de Operaciones* attempted a raid on the terrorist suspect's apartment building. Four terror suspects committed suicide by detonating a large explosive device in the building, killing one police officer and wounding eleven others.[30] Spanish authorities were not prepared for, or capable of conducting, a raid against an asymmetric threat on their own soil.

Conclusion

NATO member states need one central institution for support when faced with an overwhelming terror crisis, and NATO SOF should be that institution. And, NATO SOF must be adequately resourced so their CT capabilities meet partner-nation requirements. In the case of the Madrid bombers, requirements may have included advanced explosive ordnance disposal personnel and equipment, a determination of which units were mission-ready, and transportation to Madrid.

Another challenge that will have to be addressed is the absence of NATO SOF CT *minimum capability requirements*. AJP-3.5 provides the minimum capability requirements for a number of NATO SOF elements, to include land and maritime units.[31] These minimum capability requirements include specialty skills such as "directing terminal guidance control of precision guided munitions" for a land element and "opposed boarding operations" for a maritime element.[32] However, not one of the deployable NATO SOF structures comes with defined CT

capabilities. In fact, there are no doctrinal minimum capability requirements for NATO SOF CT in AJP-3.5. If a member state invoked Article 5 today and included a requirement for CT support, that embattled nation would likely receive a hodgepodge of CT capabilities.

Estonian Maj. Margus Kuul, in "NATO SOF Countries' Three Main Mission Sets: Direct Action, Special Reconnaissance, Military Assistance," suggests most NATO SOF partners lack the resources to maintain SOF capabilities, including essential secondary capabilities such as maritime operations.[33] The question should be asked: What minimum capability requirements are more valid in the current threat environment, CT requirements such as hostage rescue and urban sniper or maritime skills such as "combat swimming operation using closed circuit breathing apparatus with man-pack explosive devices?"[34] The answer is beyond the scope of this review, but the question will have to be answered by NATO SOF leadership if CT becomes a principal mission in a resource-scarce environment.

Kuul recommends "mapping the real capabilities" of partner state SOF units to determine specific needs.[35] A survey of preexisting NATO SOF CT capabilities would certainly pay dividends if CT were adopted as a principal mission. Prior to establishing minimum capability requirements for NATO SOF CT, a NATO-wide assessment of member-state training programs and doctrine should be conducted to find the most efficient path for CT standardization and training for NATO SOF.

Terrorism in Europe will continue to expand in the near term, and, regardless of current NATO doctrine and politics, CT will grow in importance for NATO SOF. NATO SOF should not wait for the next terror crisis to influence politicians to force a change in CT doctrine. They should begin preparation for CT as a principal mission now if they want to be relevant when a member state invokes Article 5.

Several steps should be taken in anticipation of a formal realignment of principal missions. First, conduct an honest survey of CT capabilities across NATO SOF partners. Second, begin a dialogue between partner states on what supporting CT roles NATO SOF should, or could, provide, following a single- or multi-state invocation of Article 5. Last, examine member-state SOF CT doctrine to develop the best plan for the standardization of training and resourcing the CT mission. In the spirit of the SOF adage, "Competent SOF cannot be created after emergencies occur," and neither can CT partnerships, doctrine, or mission capabilities.[36] ■

Biography

1st Lt. Matthew E. Miller is a U.S. Army Reserve military intelligence officer with the 5th Space Company, 1st Space Battalion. His nineteen years of enlisted service include serving as a psychological operations team chief, 2005–2006, in Baghdad, Iraq. He holds degrees from the University of California, San Diego, and the London School of Economics.

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(Photo by Sgt. Quanesha Deloach, U.S. Army)

Soldiers attached to 2nd Infantry Division destroy simulated chemical weapons manufacturing equipment 22 March 2016 during training near the Korean Demilitarized Zone in Black Hawk Village, Republic of Korea.

20th CBRNE Command

Organizing, Training, and Resourcing for Chemical, Biological, Radiological, Nuclear, and Explosives Operations

Brig. Gen. James B. Burton, U.S. Army, Retired

Col. F. John Burpo, U.S. Army

Capt. Kevin Garcia, U.S. Army

In April 1980, a U.S. military operation of utmost strategic importance spectacularly failed before the entire world, bringing embarrassment to the United States, unease to our allies, and celebration to our adversaries. Eight Americans died without having ever been engaged by enemy forces in the operation that was aborted long before it was close to its objective. In the aftermath, Iranian television jubilantly showed the charred remains of the eight blackened American corpses during ensuing press conferences.

Operation Eagle Claw had aimed to rescue fifty-three Americans in two locations in the heart of Tehran who were taken hostage in the 1979 Iranian Revolution. This complex operation integrated operators from the Army, Marine Corps, Navy, Air Force, and different intelligence agencies; forty-four aircraft from the different services; thousands of gallons of fuel; and a convoy of vehicles for insertion into a hostile city of over four million people. Forward reconnaissance had marked two locations in the desert, known as Desert One and Desert Two, for aircraft to land. C-130 aircraft from the Air Force, loaded with the rescue force and fuel bladders, would rendezvous with Navy helicopters piloted by marines at Desert One, where they would conduct refuel operations without illumination. From Desert One, the eight helicopters would ferry the rescue force to Desert Two on the outskirts of the city, where vehicles would be covertly staged to begin the infiltration early in the morning to the locations harboring the hostages. Expecting a firefight once the Iranians became aware of the rescue attempt, helicopters would arrive at a nearby soccer stadium to exfiltrate the hostages and rescue force to a nearby airport seized by Army Rangers so that a second fleet of fixed-wing transports could fly everyone to freedom.[1]

Leading up to Operation Eagle Claw, the teams involved from the different services and agencies had never operated together or conducted a full mission rehearsal. Mission command confusion and mission complexity contributed to the crash between a transport plane and helicopter resulting in American deaths, abandonment of equipment and sensitive information in the Iranian desert, and ultimately, the cancellation of the overall mission.

Analysis of the operation in its aftermath concluded that failure could largely be attributed to the services having brought together specialized, functional, stovepiped organizations on an ad hoc basis. Gen. Stanley McChrystal would later comment that, "At best, the plan was a series of difficult missions, each a variable in a complex equation. At worst, with an ad hoc team, it called for a string of miracles."[2] The needed miracles did not happen, and the resulting failure would forever change the way the United States approached organizing, training, and resourcing special operations.

Applying Lessons of the Past to Better Prepare for the Realities of the Operational Environment

This article examines the Army 20th Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Command's efforts in 2014 to 2015 to organize, train, and resource for CBRNE operations in order to achieve the Nation's weapons of mass destruction (WMD) and CBRNE objectives. These initiatives are a conscious effort to avoid ad hoc organizational solutions that could lead to mission failures similar to Operation Eagle Claw.

Given the nexus of ideology, technology, and CBRNE materials employed by state and nonstate actors, the authors offer that WMD may be better viewed as a subset of the more encompassing term CBRNE, which more accurately reflects anticipated mission sets and serves as a broader lens for force employment. We suggest that dealing with future operational environments in accordance with recently published strategic guidance would best be accomplished by reorganizing Army CBRNE forces and regionally aligning them in preparation to execute their critical mission sets.

Multifunctional CBRNE Task Force

In order to evaluate the possibility of effective multifunctional CBRNE formation employment, the 20th CBRNE Command developed and implemented a multifunctional CBRNE task force (TF) concept to synchronize the synergistic capabilities of our chemical, biological, radiological, and nuclear (CBRN) forces with those of our explosive ordnance disposal (EOD) forces and nuclear disablement teams. The CBRNE TF concept underwent continual evaluation at the Army's combat training centers (CTCs) and during an Army-wide Network Integration Evaluation to identify critical capability gaps and challenges.[3]

To increase our understanding of those gaps, and to aid in the development of solutions for them, the CTCs provide an optimal tactical environment for assembling the CBRNE enterprise's senior leadership as part of the 20th CBRNE Command's "Scientists in the Foxhole"

initiative.[4] This initiative is an immersive experience to better inform scientific research, technology acquisition, and policy formulation through observation of the execution of CBRNE operations in a multiechelon, field-training environment that includes a realistic replication of the full range of anticipated CBRNE hazards.

The CBRNE Strategic Landscape

Taking the strategic landscape of 1980 and applying it to today, one would be hard pressed to find a more "cannot fail" mission than countering weapons of mass destruction (CWMD). Nearly every strategic guidance document published identifying threats to the United States and its allies highly prioritizes CWMD as a clear requirement as known adversaries continue to pursue these types of capabilities.[5] Whether those adversaries are criminals, terrorists, or nation-states, "increased access to expertise, materials, and technologies heightens the risk that these adversaries will seek, acquire, proliferate, and employ WMD."[6]

Operational environment. With today's unprecedented global interconnections and the ease of access and distribution of information and threat technology, potential CBRNE employment methods are much harder to contain, track, and therefore counter. The danger is also growing as regular and irregular forces, criminals, refugees, and other agents increasingly intermingle and interact among themselves internationally across traditional lines.

While WMD may elicit the notion of difficult-to-make-and-access nuclear or chemical weapons, many CBRNE hazards are commercially available, easily procured, and when coupled with a delivery means, can have WMD-scale devastating effects. Therefore, employing WMD, and more broadly CBRNE weapons, is no longer the sole purview of nation-states. In addition to a broad range of readily available conventional weapons, state and nonstate actors can select from an array of affordable technologies that can be adapted in unconventional ways. We should, therefore, anticipate that our adversaries will seek to develop and employ CBRNE capabilities to shape the operating environment by inflicting casualties, creating conditions to deter or defeat entry operations, and eroding public allied or coalition support together with the basic will to fight.

WMD and CBRNE terminology. Numerous organizations exist across the national security enterprise studying the CWMD problem set, with many varying nuances in their definitions of WMD. However, all have the same objectives of preventing WMD development and use, and preparing for consequence management.

The American public expects that its government and national security enterprise will be trained and organized correctly to meet any threat, regardless of how vast or complex. Also, there is the public's expectation of rapid coalescing of capabilities to defeat, contain, or respond effectively to CBRNE threats to protect U.S. interests.

To apply the lessons learned from Operation Eagle Claw, it is paramount that we ensure that military forces and interagency partners responsible for confronting WMD (and more broadly CBRNE threats and hazards) are not ad hoc groups of functional, stovepiped organizations coming together on the objective without previous experience working together, but rather, are an integrated force continually training for and collectively organizing appropriately to respond.

Expanding the Scope of the Threat

The Department of Defense (DOD) defines WMD as "chemical, biological, radiological, or nuclear weapons or devices capable of a high order of destruction and/or causing mass casualties. This does not include the means

(Photo by Col. F. John Burpo, U.S. Army)

CBRNE leaders and scientists observe a simulated fuel rod enrichment facility during the Scientists in the Foxhole event November 2015 at the National Training Center, Fort Irwin, California.

of transporting or propelling the weapon where such a means is separable and divisible part of the weapon."[7] However, there is an increasing recognition of the expanded scope and impact of CBRNE threats and hazards. A 2014 CWMD white paper by the Army Capabilities Integration Center states, "the Army's approach to CWMD is consistent with the DOD definition and includes the expanded scope of explosive threats resulting in a high order of destruction. This full range of CBRNE threats and hazards is representative of the combined arms approach for future force capabilities development."[8]

In addition to broadening the scope of explosive yield considered, the full range of CBRNE threats and hazards is recommended as a broader umbrella concept for organizing, training, resourcing, and employing forces, where the WMD mission space exists as a subset of CBRNE. Including the range of low- to high-yield explosives to holistically characterize the current and future range of threats and hazards better captures the subset of critical tasks that EOD soldiers perform in operations, including unexploded ordnance disposal to improvised explosive device (IED) defeat. With this perspective, for the purposes of organizing Army operations, the term represented by the acronym CBRNE should be used as the operative term that integrates and accounts more accurately for these threats and the capabilities needed to counter them.

These perspectives are drawn from the lessons learned from the Fukushima nuclear disaster in 2012 and multiple explosive attacks that include the 1993 New York City bombing of the World Trade Center, the 1995 Oklahoma City car bombing of the Alfred P. Murrah Federal Building, the 1996 truck bombing of the Khobar Tower military complex in Saudi Arabia, the October 2000 boat bombing of USS *Cole*, and the April 2013 Boston Marathon bombing.[9]

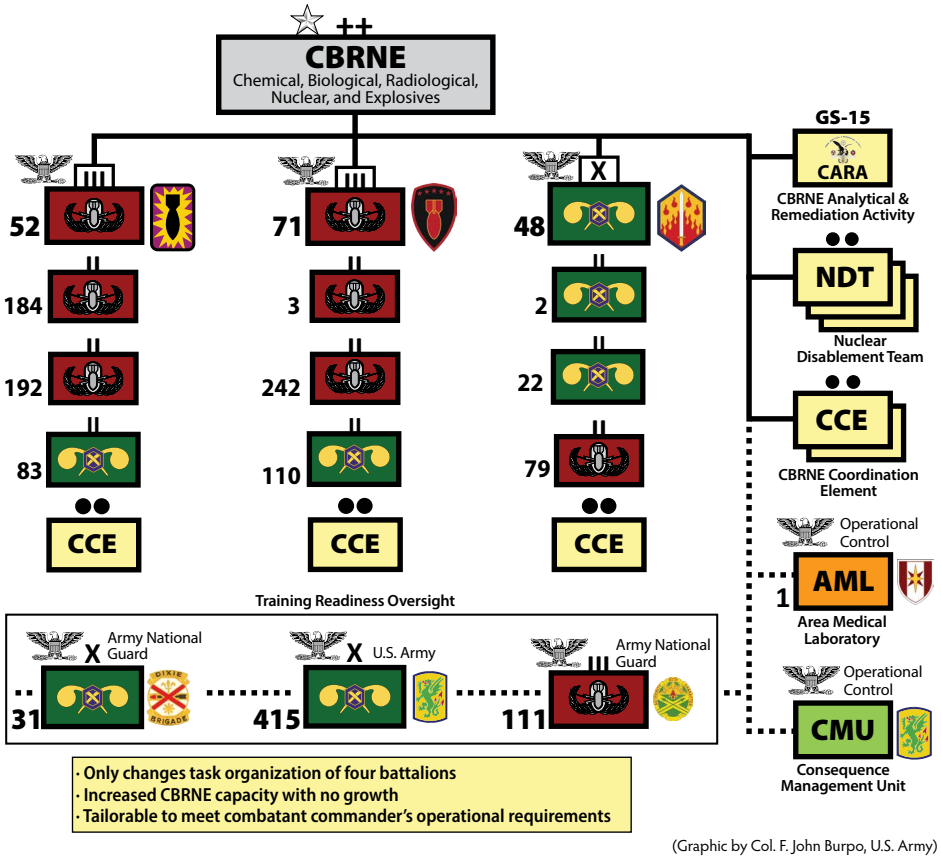
To further illustrate this point, explosives in the form of jet fuel, coupled with the delivery means of an airplane, exemplified a terrorist-delivered CBRNE event on 11 September 2001, with mass effects that would not otherwise be formally characterized as caused by a WMD under the DOD definition.

U.S. Army Training and Doctrine Command Pamphlet 525-7-19, *The United States Army Concept Capability Plan for Combating Weapons of Mass Destruction for the Future Modular Force, 2015-2024*, provides this discussion on the categorization of WMD:

> Whether or not the definition of WMD, or a definition of CWMD, will eventually include all explosives, it is appropriate to acknowledge that future solutions developed in response to CWMD capability requirements must consider cross-utility for such things as explosives detection and forensic analysis of trace chemical residue. Any analytical capability developed for CBRN applications ought to consider the chemical nature of explosives as part of the requirement.[10]

With this expanded CBRNE/WMD perspective, state-sponsored nuclear and chemical WMD are considered here as a subset under the broader umbrella concept of CBRNE threats and hazards.

While difficulty in acquiring, developing, and delivering weapons increases from chemical to biological to radiological to nuclear, with low-yield explosives remaining cheap and easy, accelerating technological advancement enables a greater ease in the development and employment of not only single threat types but also more complex hybrid CBRNE threats delivered in parallel or serial within a given operational area.



(Graphic by Col. F. John Burpo, U.S. Army)

Figure 1. Proposed CBRNE Brigade Task Force Organization

- **Three all-CBRNE-hazards-capable CBRNE brigade task forces**
- **Each CBRNE brigade task force regionally aligned with one of the three CONUS-based Army corps**
- **Each CBRNE brigade task force enabled with a CBRNE coordination element**

Proposed Task Organization:

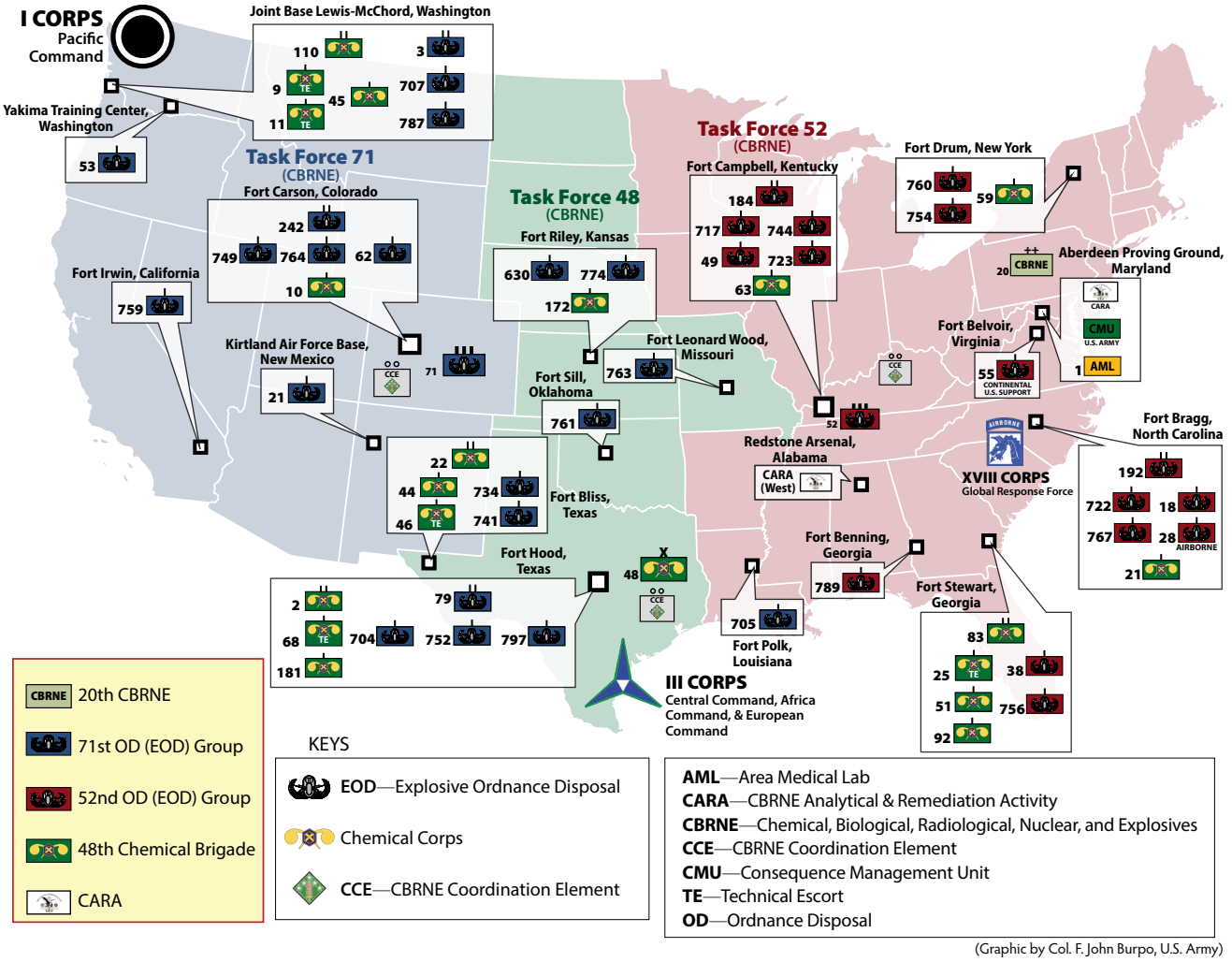
- ✓ Does not require any modified table of organization and equipment changes and can be achieved without any growth in authorizations
- ✓ Enables unity of command by reducing disparate command relationships across dispersed formation
- ✓ Provides unity of effort and increases ability to project integrated CBRNE capability
- ✓ Enables projection of mission command by echelon to assure proper employment and integration of CBRNE forces
- ✓ Does not impact ongoing defense support of civil authorities or special operations forces support missions
- ✓ Enables regional alignment consistent with Department of the Army and U.S. Army Forces Command directives
- ✓ Achieves and ensures necessary technical oversight requirements

In the same manner in which the 9/11 terrorists coupled innovative delivery means with a combustible fuel, we must anticipate unique and coupled delivery of multiple elements of the CBRNE threat spectrum. For example, IEDs are likely to remain a pervasive tactical threat, with the increasing ability to be employed simultaneously with other CBRNE components. Regardless, to successfully defeat the simultaneous presentation of various types of CBRNE threats within an operational area requires unity of command and unity of effort of special purpose, highly technical forces to appropriately synchronize an effective response. Ad hoc solutions will not work.

Current Organizational Challenges and Deficiencies

The 20th CBRNE Command comprises the majority of active component EOD and CBRN units, and these units are currently organized functionally into three brigade-level commands. The 20th CBRNE Command's mission requires the unit to deploy forces to support unified land operations and perform mission command for Army or joint CBRN operations, and to provide EOD forces to achieve national CWMD, homeland defense, and defense-support-of-civil-authorities objectives, while providing globally responsive CBRN and EOD forces to combatant commands.[11]

In support of the mission, the current functional organization of the command does not capitalize on overlapping CBRN and EOD mission areas or core capabilities, nor are any of the subordinate formation's efforts focused on any specific global region. Therefore, the distributed nature of the command across sixteen states and nineteen installations creates inefficiencies in the execution of mission command, impacts negatively on readiness, and leads to ad hoc solutions when considering how to best resource emergent contingencies that call for the simultaneous employment of EOD and CBRN forces.



(Graphic by Col. F. John Burpo, U.S. Army)

Figure 2. CBRNE Brigade Task Force Regional Alignment: Unity of Command and Unity of Effort

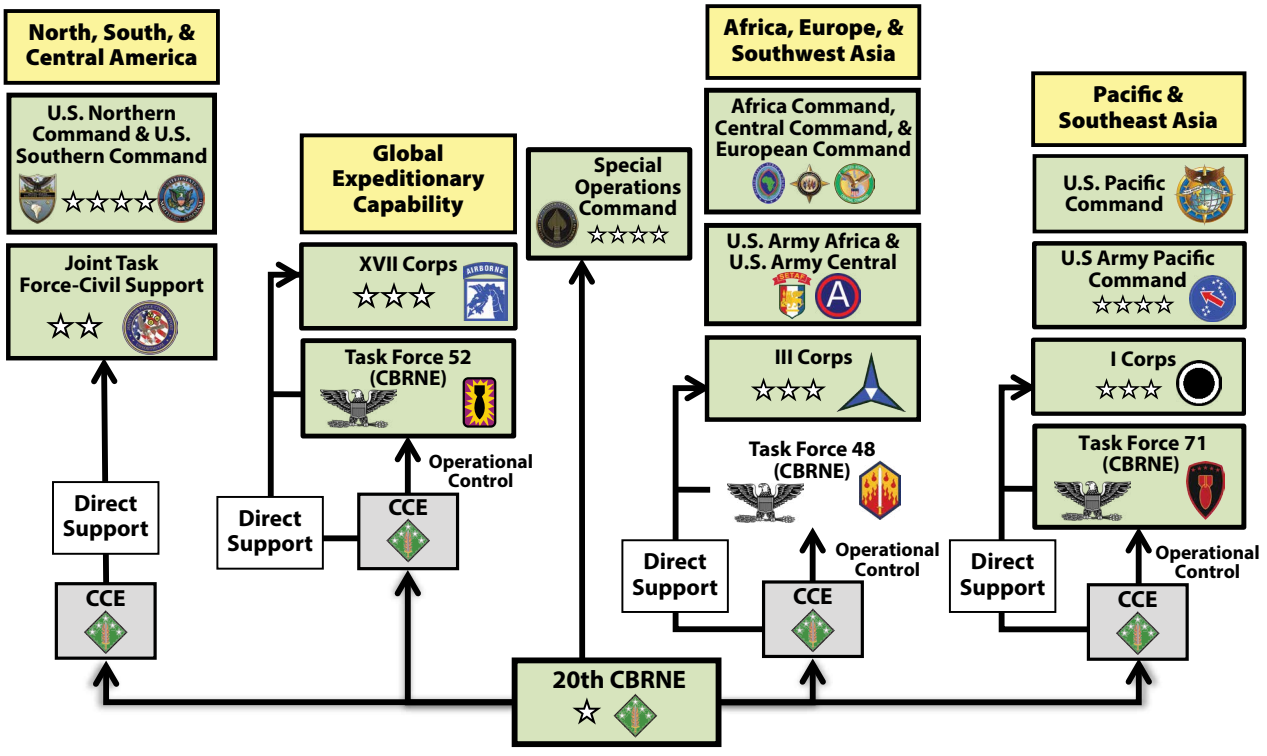
Reorganizing CBRNE Task Forces for Improved Efficiency

We offer that to operate effectively across the CBRNE spectrum, the Army must broaden the historically limiting view of the 20th CBRNE Command as focused only on CWMD and counter-IED operations. It must be available for employment across the full range of CBRNE threats and hazards and across the full range of military operations. Rather than viewing the operational environment through a narrow CWMD lens, analyzing problems through a wider CBRNE perspective better illuminates challenges and opportunities, and it leverages the full capability of the command.

For example, recent deployment of the 20th CBRNE Command's area medical lab in support of Operation United Assistance, the response to the Ebola crises in West Africa, illustrates an example of CBRNE force employment that would have been precluded based on a strictly WMD employment mindset.

We propose that to meet similar future challenges emerging from the rapidly changing strategic environment, as well as the intent of the *Quadrennial Defense Review* and the directives of the *Army Strategic Planning Guidance*, by task-organizing the functionally organized command into three multifunctional CBRNE brigade TFs.[12] Each TF would be enabled with robust CBRNE planning and coordinating expertise and technical reach-back capabilities provided by an aligned CBRNE coordination element (see figure 1).

Establishing unity of command, defining clear objectives, and employing maneuver to capitalize on the flexible application of power are battle proven remedies



Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE)

(Graphic by Col. F. John Burpo, U.S. Army)

Figure 3. Regional Alignment Construct

for complex challenges. Reorganizing the 20th CBRNE Command to create three multifunctional, regionally focused CBRNE brigade TFs will ensure that the Army has ready, reliable, and globally responsive CBRNE capabilities to meet the challenges of the current and future strategic environments.

Reorganizing the command from its current configuration of one CBRN brigade and two EOD groups into three similarly organized CBRNE brigade formations would result in an immediate increase in national capacity, with zero growth in personnel.

Whether for training or contingency operations, or as enduring organizations, task-organizing into three regionally aligned multifunctional CBRNE brigade TFs would ensure that these forces are properly organized, focused, positioned, and prepared to respond globally to ever-evolving CBRNE threats.

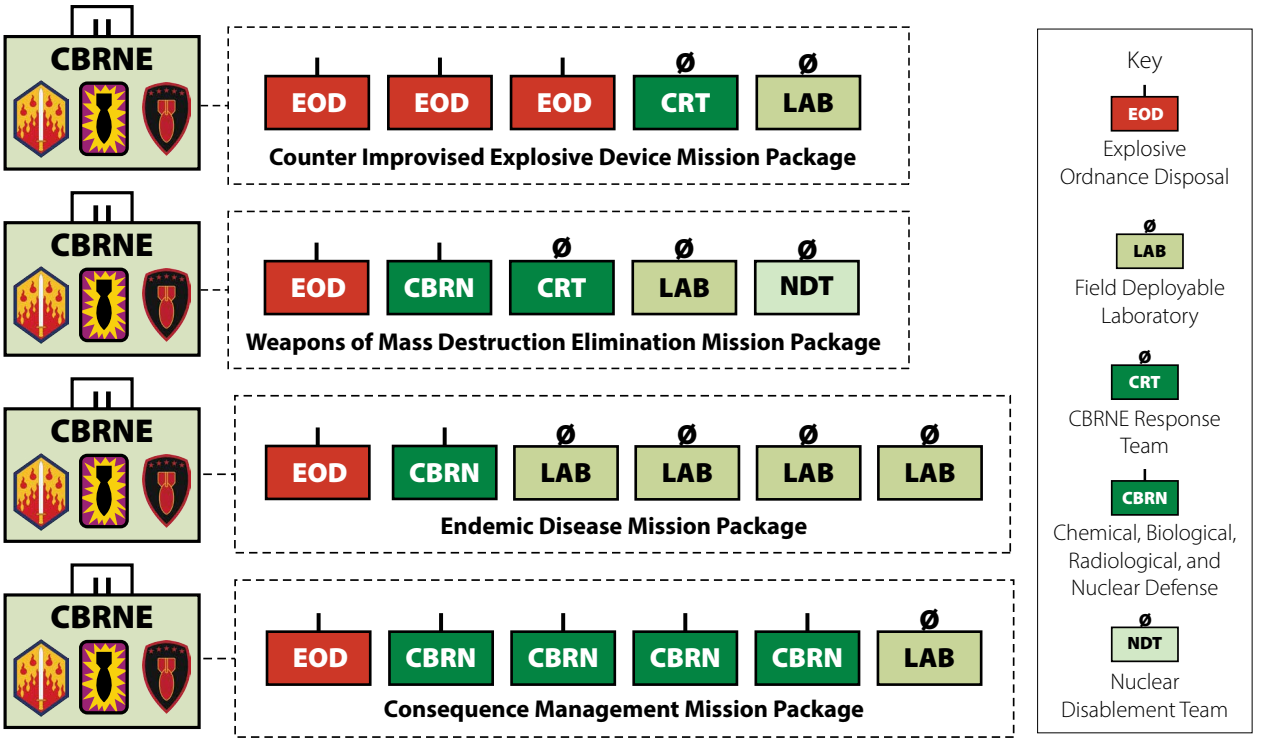
This adjustment to mission command can be achieved with no physical relocation of units, and it would immediately deliver more flexible and capable regionally focused CBRNE forces. Given the anticipated reductions of EOD force structure due to Total Army Analysis 18-22, the proposal would mitigate the challenges of historical ad hoc solutions to similar and anticipated future mission sets and it would overcome the command's current unity of command and unity of effort challenges resulting from the widely distributed basing construct and complex mission profiles.

For the supported commanders, task-organizing the command would resolve the issue of disparate command and support relationships of CBRNE forces throughout the formation by assembling them under a single O-6 commander and integrated staff.

Regional Alignment of CBRNE Brigade Task Forces

The CBRNE brigade TF concept (henceforth referred to as a CBRNE brigade) would enable the packaging of trained and ready CBRNE forces under one commander. This would increase mission command effectiveness and reduce the impromptu relationships reminiscent of ad hoc planning for Operation Eagle Claw.

Each CBRNE brigade would be regionally aligned with the Army service component commands, and in support of the three Army corps based in the continental United States (CONUS) in accordance with the Army's regional



The Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Battalion Task Force is TAILORABLE and SCALABLE, providing integrated CBRNE capability with a mission command element to the supported commander.

(Graphic by Col. F. John Burpo, U.S. Army)

Figure 4. Potential Integrated CBRNE Mission Packages

alignment of forces concept (see figures 2 and 3).[13] TF 71 (CBRNE), positioned in the western United States, would align in general support of I Corps with a focus on the U.S. Pacific Command area of responsibility (AOR). TF 48 (CBRNE), positioned in the central United States in general support of III Corps, would focus on the U.S. Central Command, U.S. Africa Command, and U.S. European Command AORs. TF 52 (CBRNE), located in the eastern United States, would align in general support of XVIII Airborne Corps and their global response force mission.

Task-organizing and regionally aligning the 20th CBRNE Command's subordinate formations would markedly improve readiness through unity of command, unity of effort, and increased "train as you intend to fight" familiarity between 20th CBRNE and supported forces. By focusing efforts regionally and aligning in support of the Army service component commands through the three CONUS-based corps, the command would be better prepared to fulfill its expeditionary mission requirements without relying on traditional ad hoc solutions.

Through task organization, the leaders, soldiers, and civilians of the 20th CBRNE Command would become better informed about their potential primary operational environment and better able to train habitually with their supported maneuver formations. This, in turn, would increase interoperability and enhance examination of specific regional threats, from current combat operations to the entire range of threats found across the combatant commands.

CBRNE Task Forces at the Combat Training Centers

To test the CBRNE TF concept, the 20th CBRNE Command organized and employed different configurations of CBRNE battalion-task-force formations in support of brigade combat teams during nine CTC rotations in fiscal years 14 and 15. Additional rotations are planned for fiscal years 16 and 17. Both CBRN and EOD battalions have served as the integrating headquarters under which CBRN, EOD, and CBRNE response teams; nuclear disablement teams; and expeditionary laboratories have been assembled.

CBRNE TFs can be scaled and tailored across a range of possible contingency operations as shown in

figure 4. These mission-tailored CBRNE TFs provide the supported commander a "single point of touch" to plan and execute interrelated CBRNE mission sets, allowing for effective mission command of technical forces on CBRNE target sites.

To increase training realism, the 20th CBRNE Command collaborated with the National Training Center, the Joint Readiness Training Center, and the Brigade Modernization Command at Fort Bliss, Texas, to build an array of new CBRNE target sites. With equipment transfers from Oak Ridge National Laboratory and other interagency partners, these targets replicated an unprecedented degree of CBRNE training realism.

When mission sets and training objectives warrant the employment of CBRNE TFs, the training relationships and lessons learned are invaluable to operationalizing the force. They serve as a foundation for future concept development.

Resourcing—Scientists in the Foxhole and Advanced Technology Demonstration

Given the 20th CBRNE Command's multiple proponents that oversee interrelated CBRNE force doctrine, training, and resourcing issues—including the CBRN School, the EOD Directorate, and the U.S. Army Nuclear and Combating WMD Agency (USANCA)—a holistic enterprise solution is required. To facilitate that approach, the 20th CBRNE command, in collaboration with the Defense Threat Reduction Agency, organized a "Scientists in the Foxhole" initiative.[14] This effort assembled senior leaders throughout the CBRNE enterprise, to include representatives from the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics; the Defense Threat Reduction Agency; the Joint Requirements Oversight Council; Headquarters, Department of the Army G-8; U.S. Army Forces Command; the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD); Research and Development Command; the Edgewood Chemical Biological Center; USANCA; and the EOD Directorate. The program provides senior leaders and scientists from the CBRNE enterprise an opportunity to meet with and observe soldiers and civilians conducting CBRNE tactical operations in a live force-on-force training environment.

These type of engagements serve to assist CBRNE enterprise leadership in recognizing and articulating capability gaps and defining potential materiel and nonmateriel solutions to enable the Nation's CBRNE capabilities. For example, JPEO-CBD, in partnership with the 20th CBRNE Command and many of these same enterprise partners, is leading an advanced technology demonstration to accelerate technology development and implementation and address multiple operational issues while gaining efficiencies in materiel and nonmateriel solutions.[15]

This enterprise approach to holistically and more rapidly resource capability gaps and requirements allows the Army and the joint force to better resource an integrated, combined arms approach to combating CBRNE threats.

Impacts: The Way Forward

Organizing the functional subordinate formations of the 20th CBRNE Command into three multifunctional, regionally aligned CBRNE brigades is an important step in meeting the Army's strategic planning guidance for this one-of-a-kind formation. This reorganization provides the Army and the Nation with an immediately improved solution, with no growth and no physical relocation of units, for delivering integrated CBRNE capacity to meet expeditionary and campaign requirements.

The expanded definition of CBRNE threats and hazards, with WMD and CWMD missions as a subset, facilitates a more expansive understanding of the operational environment and better informs the analysis of potential geographic regions that would require the employment of the command or its subordinate elements. Continued training and validation of the multifunctional CBRNE TF construct at CTCs, in concert with innovative enterprise efforts such as the Scientists in the Foxhole and Advanced Technology Demonstrations, ensure that the Nation's CBRNE forces are properly organized, trained, and resourced for mission success, avoiding ad hoc organizational failures such as those seen in Operation Eagle Claw.

It is imperative that the 20th CBRNE Command provide the Army and the Nation with ready, reliable, and globally responsive integrated CBRNE forces capable of leading and executing CBRNE operations and activities anytime and anywhere. Task-organizing the command better enables that end state through unity of command, unity of effort, and a regional focus accounting for all CBRNE hazards, to better inform our training and equipping strategies. ■

Biographies

Brig. Gen. James B. Burton, U.S. Army, retired, is the former commanding general of the 20th CBRNE Command, Aberdeen Proving Ground, Maryland. He has commanded at every echelon, including commanding a mechanized combined-arms team during Operations Desert Shield and Desert Storm; 2nd Battalion, 5th Cavalry, in Kuwait during Operation Intrinsic Action; and the 2nd Brigade Combat Team of the 1st Infantry Division in Baghdad, Iraq. He previously served as deputy commanding general for maneuver of the 2nd Infantry Division. He received an MMAS from the U.S. Army Command and General Staff College and an MA in national security and strategic studies from the Naval War College.

Col. F. John Burpo, U.S. Army, is the deputy department head for the Department of Chemistry and Life Science at the United States Military Academy, West Point, New York, and the former deputy commander for transformation in the 20th CBRNE Command. He received a ScD in bioengineering from Massachusetts Institute of Technology, an MS in chemical engineering from Stanford University, and a BS in mechanical-aerospace engineering from West Point. He has served in airborne, armor, and Stryker units with humanitarian, peacekeeping, and combat operational deployments to Rwanda, Bosnia, and Iraq.

Capt. Kevin A. Garcia, U.S. Army, is a cavalry officer serving in Central America engaged in counternarcotic/counter transnational organized crime efforts. He received a BA from the University of Notre Dame and an MS in organizational leadership from Columbus State University. He previously served as a platoon leader in Iraq with the 3rd Armored Cavalry Regiment, and as an aide-de-camp in the 2nd Infantry Division and in the 20th CBRNE Command.

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(Photo by CW2 Brian Boase, 101st DIVARTY PAO)

101st Division Artillery soldiers process a counterfire mission during the November 2015 Warfighter Exercise 16-02 at Fort Campbell, Kentucky.

Reinventing the Wheel

Operational Lessons Learned by the 101st Division Artillery during Two Warfighter Exercises

Maj. Travis Robison, U.S. Army

Capt. Alex Moen, U.S. Army

The U.S. Army reactivated active component division artillery (DIVARTY) units in 2014 after a ten-year hiatus. Although the DIVARTY is not a new organizational structure, its latest incarnation comes at a period when critical operational-level fires skills have atrophied. DIVARTY members now find themselves relearning skills that were once common artillery competencies. Additionally, incorporating tactics, techniques, and procedures that operationalize technological innovations and lessons learned in combat during the past fourteen years is a learning challenge.

The 101st DIVARTY reactivated in 2014 and participated in two division-level warfighter exercises (WFXs) in one year. During these exercises, the 101st DIVARTY relearned essential skills, developed new procedures, and had the unique opportunity to re-evaluate lessons learned to identify best practices for dealing with organizational and operational challenges. This article provides a brief background of WFXs and common fires issues, outlines the context of the 101st DIVARTY's training scenarios, and summarizes four important lessons learned as best practices.

Warfighter Exercise Background and Commonly Observed Issues

WFXs are distributed, multiechelon, and multicomponent events focused on training mission command to brigade-, division-, and corps-level commanders and staffs in unified land operations scenarios.[1] These scenarios focus on mission-essential tasks and core warfighting competencies using an adjustable operating environment against a hybrid, near-peer adversary in an austere theater of operations.

The U.S. Army Combined Arms Center Mission Command Training Program (MCTP) at Fort Leavenworth, Kansas, is the principal combat training center for mission command training and hosts WFXs.[2] Observer/controller/trainers are subject-matter experts who coach, teach, and mentor participating staffs, while MCTP senior mentors coach commanders during the training events.

Experience has shown that MCTP trainers and mentors consistently note common issues experienced by units they observe. For example, across the warfighting functions, most issues stem from challenges associated with integrating and synchronizing division efforts at the operational level of war. Divisions typically struggle to delineate fights within the deep-close-security operational framework, to synchronize combined arms maneuver, and to effectively target. They also consistently underestimate sustainment needs and insufficiently plan protection efforts. Focusing on fires, MCTP observers frequently note that DIVARTYs labor to weight the main effort with artillery assets, conduct insufficient planning, and produce limited assessments during the decide, detect, deliver, and assess (D3A) targeting process.[3]

In contrast, The 101st DIVARTY minimally experienced these deficiencies during its two WFXs. This allowed the organization to focus instead on improving its collective fires skills and developing techniques needed to support the division.

101st DIVARTY Training Scenarios

The 101st DIVARTY participated in WFXs 15-05 and 16-02. The first occurred in support of the 36th Infantry Division (Texas National Guard) less than eight months after the DIVARTY's activation. This event served as the 101st DIVARTY's validation exercise. It also provided an opportunity to test the DIVARTY's modularity by having it serve as the force fires headquarters (FFHQ) for a National Guard division in accordance with the Army Total Force initiative.[4]

DIVARTY's second exercise supported the 101st Airborne Division (Air Assault), and was the first time it fully integrated within its parent division as the FFHQ.

Both scenarios replicated a decisive-action environment in a fictional country. The primary adversary possessed near-peer capabilities (i.e., combat systems with capabilities similar to or better than our own) and presented itself as a hybrid threat combining conventional and irregular forces. Each scenario contained similar elements, such as a forward passage of lines held by host-nation forces, offensive operations, a contested river crossing, and rear-area security operations. The main differences between the scenarios centered on the impacts of terrain, the enemy's defensive capabilities, and friendly-force task organization for combat.

Overall, the similarities between the scenarios allowed the 101st DIVARTY to relearn doctrine and validate its decisive-action proficiency. Scenario differences facilitated the development of new tactics, techniques, and procedures supported by doctrine.

Key Lessons Learned

The following discussion highlights the 101st DIVARTY's four key lessons learned regarding battlefield geometry, the division counterfire fight, unmanned aircraft system (UAS) integration, and fires planning.

Battlefield geometry. Coordinating and synchronizing fires is one of a DIVARTY's primary duties as the FFHQ. Although there had been limited DIVARTY participation in WFXs since reactivation, initial MCTP observations highlighted difficulties DIVARTY and division headquarters had with

establishing, disseminating, and tracking permissive fire support coordination measures (FSCMs). These expedite, as opposed to restrict, attacking targets with fire and provide graphic control measures.[5]

These observations did not apply to the 101st DIVARTY during either of its WFX experiences because it had established and monitored FSCMs in the Advanced Field Artillery Tactical Data System and Joint Automated Deep Operations Coordination System. Instead, the primary battlefield geometry challenge resulted from the planned placement and trigger-based movement of FSCMs.

The two most important FSCMs were the coordinated fire lines (CFLs) and fire support coordination lines (FSCLs). The former is the line beyond which the establishing headquarters may fire surface-to-surface munitions without additional coordination. Corps headquarters typically establish the latter within its area of operations to coordinate the expeditious attack of targets beyond the line by joint weapons systems. Since these FSCMs were permissive, any unit could shoot beyond them after coordinating with the establishing headquarters.

Besides their importance in facilitating fires, CFLs and FSCLs helped delineate the areas of responsibility for attacking targets (see figure). The corps "owns" the area beyond the FSCL, the area between the FSCL and CFL defines the division's deep fight, and areas short of the CFL belong to brigade combat teams (i.e., the division's close fight). During WFX 15-5, the 101st DIVARTY learned that these permissive control measures were too far apart if planned for based on the maximum range of conventional munitions. Planning FSCMs based on the maximum range of cannon and rocket systems inadvertently allowed the enemy to position where DIVARTY could not fire without using its limited supply of extended-range or precision munitions. As a result, doing so created safe havens in which the enemy operated with limited disruption.

Although rocket munitions such as guided multiple-launch rocket systems and Army tactical missile systems might have been available to range targets within these artificial safe havens, their limited availability and attack guidance criteria made it impractical to do so. As a result, the division had to request or "re-role" air support assets to engage enemy formations in order to continue shaping its deep fight.

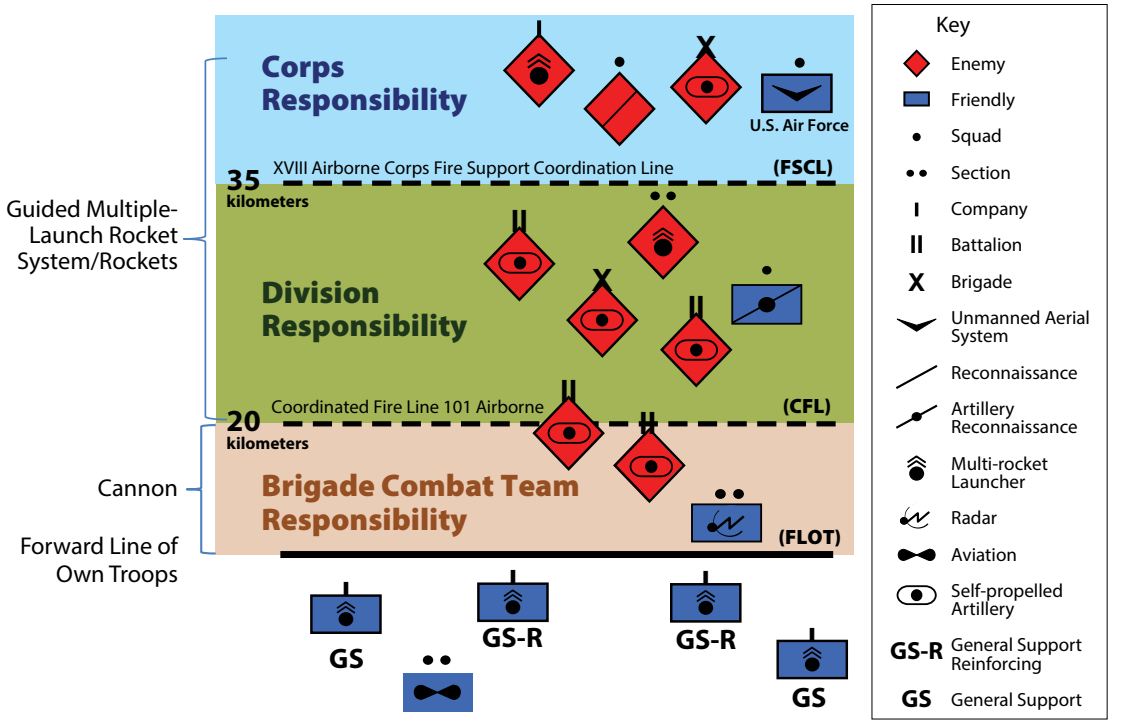
Similar issues arose when planning the CFL at the maximum range of cannon systems. Doing so forced the 101st DIVARTY to use general support fire assets in the close fight instead of to shape future operations.

CFLs should be as close as possible to the forward line of troops (FLOT). The DIVARTY planned CFLs at two-thirds of the maximum range of direct-support cannon battalions (a variation of the one-third–two-thirds rule of thumb for artillery positioning). DIVARTY also allocated general support-reinforcing assets to brigades with an enumerated number of rockets available for reinforcing fires. This allowed brigade combat teams to attack enemy formations short and long of the CFL.

Similarly, the DIVARTY planned FSCLs based on the range of the most commonly available rocket munition type instead of extended-range or precision munitions. Both techniques denied enemy safe havens and allowed DIVARTY elements to achieve effects throughout the operational area in support of the division's counterfire fight. Battlefield geometry also plays an important role in a DIVARTY's ability to conduct counterfire.

Counterfire. Poorly placed FSCMs hinder effective friendly fires and magnify the impact of artillery range advantages enjoyed by WFX enemies as well as real-world enemies and adversaries. Many enemy artillery systems outrange U.S. systems, and enemies are technically capable of achieving a greater volume of fire. Both WFXs highlighted this operational reality and challenged the 101st DIVARTY's ability to destroy, defeat, and disrupt enemy artillery systems.

A DIVARTY is its division's counterfire headquarters, so the counterfire fight was the 101st DIVARTY's focus during its WFXs. This mission-critical task sets the conditions for future division operations by attriting enemy indirect-fire systems before friendly maneuver forces come within range. This task has two components that become separate fire support tasks. First, reactive counterfire focuses on engaging enemy indirect fire systems following target acquisition. The 101st DIVARTY positioned its Q-37 Firefinder radar systems so they could detect surface fires between the FLOT and the FSCL. Due to the large volume of counterfire, DIVARTY split responsibility for fire mission processing. The target processing section (TPS) processed acquisitions for counterfire, while the fire control element remained focused on processing planned targets and targets of opportunity.



(Graphic by Maj. Travis Robison, U.S. Army)

Figure. Delineation of Responsibility Using Fire Support Coordination Measures

Dividing responsibility significantly improved fire mission processing times and responsiveness. The targeting officer and the S-2 (intelligence staff officer) then applied predictive battle-damage assessment to determine likely effects on the enemy that facilitated subsequent targeting, positioning, and task-organization decisions.

Second, the next counterfire task involves actively targeting enemy indirect fire systems, referred to as "proactive counterfire" in doctrine. However, since counterfire by definition is always reactive, the 101st DIVARTY opted to assign the task of "strike" or "interdiction" fires. It accomplished this task by analyzing patterns in radar acquisitions and ground-movement target indicators (GMTIs). The targeting officer and the S-2 determined what type of indirect fire system was engaging friendly forces based on the range at which the enemy fired. The S-2 mapped patterns of acquisitions and GMTI routes between firing positions to create target areas of interest (TAIs), which the division observed with UAS assets.

Once a UAS asset detected enemy artillery formations, the DIVARTY initiated fire missions against the target and conducted immediate battle-damage assessments. Strike fires that integrated UAS and dedicated fires assets proved to be the most effective counterfire technique during both WFXs. These fires maximized the DIVARTY's extended-range and precision-munition capabilities, while mitigating enemy range advantages.

Unmanned aircraft system integration. Integrating UAS and fires assets into a direct sensor-to-shooter link is fast, responsive, and effective. The ability of UASs to loiter over TAIs and provide highly accurate target locations makes them ideal for leveraging advantages in precision-guided munitions against enemy indirect fire systems. UASs are also capable of providing immediate battle damage assessments to inform intelligence collection and targeting processes.

During its WFXs, the 101st DIVARTY replicated recent Russian tactics in Ukraine with similar success. The 101st DIVARTY developed techniques and procedures for integrating UASs into the counterfire fight during WFX 15-5, and it perfected dynamic retasking procedures and fire-mission processing during WFX 16-2. Both experiences proved that UAS integration in support of counterfire strike operations works.

Planning. The DIVARTY should assist in coordinating, integrating, and synchronizing the division's

(Photo by 1st Lt. Jonathan J. Springer, U.S. Army)

Soldiers from Battery A, 2nd Battalion, 320th Field Artillery Regiment, 1st Brigade Combat Team, 101st Airborne Division, fire rounds from their M119A2 howitzer at enemy targets 13 January 2008 during Operation Fulton Harvest in the Al-Jazīrah region of Iraq.

UASs during the targeting process. The DIVARTY S-2's development of TAIs based on artillery acquisitions and GMTI analysis not only informed these efforts, but it also supported the development of triggers for retasking UAS to the DIVARTY during critical phases of the counterfire fight. During these periods, the DIVARTY performed as a functional joint air-ground integration cell focused on counterfire within a defined TAI. It located targets, cleared ground and airspace, and processed fire missions against identified targets in accordance with the attack guidance matrix. DIVARTY's ability and authority to coordinate directly with corps and adjacent divisions assisted these efforts.

The primary challenge to integrating UASs is the extra steps involved in fire-mission processing. Within the 101st DIVARTY, the lethal fires section was responsible for coordinating the necessary steps. Integrating UAS and artillery during key points in the counterfire fight proved to be highly effective, and the processes developed by the 101st DIVARTY filled a void in existing doctrine regarding artillery interdiction (i.e., proactive counterfire).

MCTP observers routinely note that poor fires planning results in insufficient support to the ground scheme of maneuver.[6] In contrast, the 101st DIVARTY's experiences at WFXs 15-05 and 16-02 highlighted the value of detailed plans, and the unit received recognition for expertly meeting doctrinal fires planning requirements.

The key to the unit's success was the implementation of a plans synchronization meeting for fires planning aligned with division planning horizons. The 101st DIVARTY plans synchronization meeting enabled the staff to conduct field artillery planning that synchronized efforts across all warfighting functions. As the maneuver headquarters, the division was responsible for fire-support planning and the DIVARTY was responsible for fires planning to support the scheme of maneuver.

The DIVARTY's planning framework created and facilitated a link between the division and DIVARTY staffs. Current doctrine does not clearly define this link, so DIVARTY's implementation of this framework helped delineate the specified and implied responsibilities of each organization.

The division target working group, enabled by the staff, used the D3A targeting process to facilitate fire support planning that developed fire support tasks (FSTs), a high-payoff target list and target

synchronization matrix, an information collection plan, and target refinements. The 101st DIVARTY staff conducted fires planning that developed a synchronized plan that achieved assigned FSTs.

During the plans synchronization meeting, operations planners, staff-section representatives, and participating brigade fire support officers refined FSTs into field artillery tasks, developed courses of action for artillery and radar positioning, determined effects and requirements, synchronized sustainment, and assigned planning responsibilities to direct-support artillery battalions. In addition to developing field artillery tasks and other supporting planning requirements, another output of the meeting was recommendations for target refinement, the high-payoff target list, and airspace control measures submitted into the division targeting process.

Once the DIVARTY began operations, planners in the synchronization meeting identified enemy artillery positions and planned coordinated attacks against those locations. The plans section developed a system to perform course-of-action development, war-gaming, and target refinement for the next five days of the air-tasking order cycle, with inputs from the entire DIVARTY staff.

The plans staff transitioned efforts to current operations using a detailed transition brief twenty-four to thirty-six hours before planned execution. Proactive coordination between plans and current operations staffs aided the 101st DIVARTY's ability to execute a rapid decision-making and synchronization process, which enabled the DIVARTY commander and staff to adjust plans as operational changes developed.

The 101st DIVARTY did not experience the majority of commonly noted fires-related issues during two WFXs. Instead, the organization had an invaluable opportunity to relearn fires skills needed to support the division at the operational level of war. The DIVARTY also developed new procedures for dealing with systemic organizational and operational challenges. The 101st DIVARTY's lessons learned regarding battlefield geometry, the division counterfire fight, UAS integration, and fires planning were critical to preparing the organization for success in future decisive action conflicts. ■

Biographies

Maj. Travis Robison, U.S. Army, is the deputy commander of the 101st Division Artillery (Air Assault). He earned a BA in political science from the University of Colorado, an MPA from the University of Montana, and an MMOAS from the U.S. Air Force Air Command & Staff College. He was recently selected as an Advanced Strategic Planning & Policy Program fellow. His military experience includes assignments in Germany, Kosovo, South Korea, the United States, Iraq, and Afghanistan.

Capt. Alex Moen is the plans officer for the 101st Division Artillery (Air Assault). He has a BA in political science from Texas A&M University and is completing an MBA from Arizona State University. His military experience includes assignments in the United States, Iraq, and Afghanistan.

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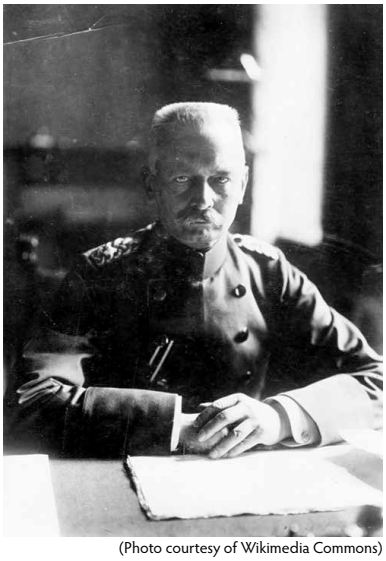
The Mud of Verdun
Falkenhayn and the Future of American Landpower

Maj. Robert Chamberlain, U.S. Army

On 21 February 1916 one of the most cataclysmic battles in the history of warfare began near the ancient fortress city of Verdun. The battle lasted nearly a year and in the one hundred square miles of contested terrain, there were approximately eight hundred thousand French and German casualties. For a time it was the focal point of the war on the Western Front, concentrating the energies of two nations, their militaries, and their strategic leadership. As a testing ground of the German High Command's theory of warfare, it proved to be the undoing of Germany's chief of staff, Gen. Erich Georg Anton Sebastian von Falkenhayn. Understanding his theory, how it drove operations, and how it ultimately determined the outcome of the battle is important for thinking about contemporary American military strategy. As in 1916, the theory of warfare we develop to meet contemporary challenges determines whether the courage of our soldiers and the technological achievements of our nation can be effectively transformed into desirable political outcomes.



(Photo courtesy of Wikimedia Commons)

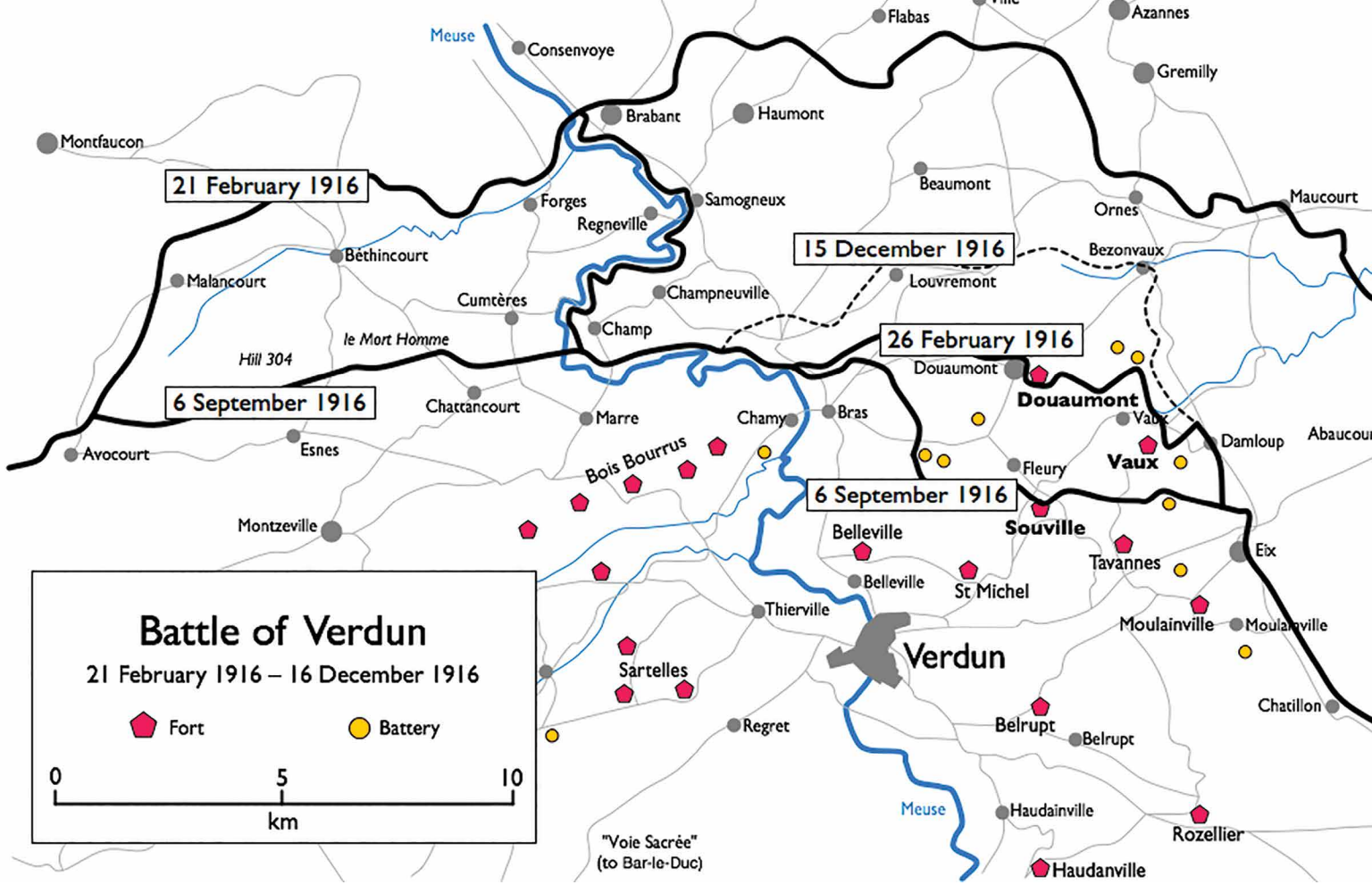
Erich von Falkenhayn, German general and minister of war, in 1913.

This article undertakes four tasks. First, a simple framework is created to describe a theory of warfare and its functions. Second, the development of German strategic thought from 1914 to 1916 is explored using the theoretical framework outlined in the previous section. Third, Verdun is examined in light of this analysis, which argues that the German theory of warfare had an enormous impact on the battle's planning, conduct, and outcome. Finally, our own theory of warfare is reviewed, as it bears many similarities to that employed by the Germans at Verdun, and therefore the battle and its outcome bear important warnings for American joint operations in the future.

What Is a Theory of Warfare?

A theory of warfare is a description of how a military intends to produce strategic outcomes. In making a decision to apply a military remedy to a strategic problem, one employs a theory of warfare to determine how and if the proposed solution will work. In the modern world, the development of grand strategy often receives theories of warfare as a given. Due to the time and expense required to develop and train a modern military, the strategic decision-makers are bound by the military capabilities and doctrine that exist when they assume power.

A theory of warfare provides the ordering principles of a military whether made explicit or not. It is a description of the strategic environment, of what the military is, and how it applies itself against an adversary. Everything else that a military does—how it dresses, organizes itself, procures equipment, imposes discipline, generates force, sees terrain, treats captured enemies, deals with civilians, and so forth—is largely a function of how it defines and achieves success in war.



(Graphic courtesy of Wikipedia)

At a minimum, a theory of warfare has four essential components: strategic givens, a generated military, military effects, and a political outcome. The strategic givens describe the background conditions in which force will be generated; of particular importance is the resource context from which the military emerges and the adversaries for which it is designed. The generated military describes the "stuff" that is controlled by the military, how it is organized for use, and the uses to which it is put. These friendly efforts yield some military effect on the adversary that, according to the theory, will change the military situation in some important way. As a result of the new military situation that friendly forces have imposed, the adversary will be forced to accept a new political reality and a desired strategic outcome will occur. The four elements of a theory of warfare connect to one another, as in the following proposition: "Given a set of conditions, we will employ our formations in order to achieve some military effect on our adversaries, leading to their capitulation and a desired political end state."

Falkenhayn and the Evolution of German Theories of Warfare 1914–1916

In 1914, the German theory of warfare was designed to address a difficult set of givens: How does one fight a set of adversaries with greater aggregate resources on two fronts simultaneously? The Germans devised an answer that was rooted in their decisive defeat of Napoleon III's armies in 1870 during the Franco-Prussian War. In that conflict, they used audacity and decisive maneuver to trap Napoleon's forces in two large fortresses: Metz and Sedan. Napoleon, cut off in Sedan and forced to surrender after failing at his breakout attempt, sat helplessly in Berlin as his empire fell and was replaced by the Third Republic.

Applying that historical lesson to the challenges of the early twentieth century, German planners determined that they would need to defeat the French army in a single stroke, before the Russian army could mobilize and before the comparative population and industrial advantages of the Entente could be brought to bear.[1] It would require rapid mobilization, the reduction of key

strong points, and extremely mobile forces that could be transferred across robust internal lines of communication. These forces would engage the French with combined arms maneuver on a continental scale, enveloping and destroying the Western armies by cutting them off from their capitals and lines of supply.[2] With this accomplished, the French government would be forced to agree to peace terms, and the German army could turn its attention to the east.

Articulated in terms of the theoretical framework presented above, the 1914 German theory of warfare would read: Given the need to fight a two-front war at a numerical disadvantage, the German army will combine rapid mobilization, concentrated heavy cannon, and strategic mobility to engage in combined arms maneuver to envelop the French army.[3] When the French army is cut off from its capital and its lines of communication, it will surrender, which will lead the French to conclude a separate peace.

The plan generated by this theory failed to destroy the French army. In the "Miracle on the Marne," the French Sixth Army, famously reinforced by soldiers brought to the front by Parisian taxicabs, attacked the German right wing, and ended the threat of encirclement by the attacking Germans. Over the next two years, the opposing armies created a trench line of increasing depth and complexity that stretched across Europe. Clinging to their former theories of warfare, both sides sought to

(Photo courtesy of Wikipedia, Germany)

German infantrymen with flamethrowers and hand grenades leave the trenches to assault French positions at Le Mort Homme, during the Battle of Verdun, mid-March 1916.

achieve a strategic penetration of their enemy's defenses in order to obtain victory through a single decisive battle. It quickly became apparent to all sides that such penetrations were no longer possible as attacks were launched at enormous costs that were unable to sustain more than limited gains in the face of entrenched defenders and counterattacking reserves.[4] Thus, a new theory of warfare needed to be devised to account for this novel state of affairs.

On the German side, Kaiser Wilhelm II placed responsibility for a successful conclusion of the war in the hands of his chief of staff, Falkenhayn. After dismissing Gen. Helmuth von Moltke for his failures in the initial attacks in 1914, the Kaiser made Falkenhayn head of both the German military and the ministry of war. While he was the subject of bureaucratic intrigue and divested himself of the ministerial portfolio, Falkenhayn was the architect of the German war effort that began in September 1914 and lasted until the conclusion of Verdun.

The givens that Falkenhayn faced were quite daunting: the same two-front war, superior enemy resources that had tormented his predecessors, the reality of a naval blockade that could starve Germany into submission (making a prolonged stalemate a losing proposition), and a French defensive system and suite of technologies that precluded strategic penetration. Without the ability to engage the enemy in a single decisive battle, Falkenhayn determined that he would have to fight a sequence of battles that would exhaust his enemies' ability to continue to resist.[5]

To achieve this outcome, Falkenhayn would organize his artillery into large, centrally managed organizations. He would then employ elaborate military deception operations and extremely tight operational security to keep his opponents off balance while he massed his forces. When ready, the German army would launch a massive barrage along a narrow front, and then advance to sufficient depth to inflict maximum damage on the defending forces. However, it would not seek a strategic breakthrough.

The purpose of these engagements was to eliminate enemy formations in battle, not to induce the collapse of resistance through deep penetration of enemy lines. This approach was first implemented in the series of battles fought on the Eastern Front in 1915, wherein the German forces destroyed the Russian army, first at Gorlice and then in Poland. The military effect was stunning. The campaign was "a series of set-piece breakthrough battles, which cost the defenders dearly each time they attempted to stand and face the advancing Austro-German force."[6] The purpose was to grind the Russian army into nothing, leaving the enemy with a residual military capability that was incapable of offensive action. To this end, the German army inflicted "over two million casualties upon the Russians."[7]

The capitulation mechanism envisioned by Falkenhayn differed substantially from that envisioned by German strategists of the prewar era. In 1870–1871, the German army had destroyed Napoleon's forces, besieged Paris, and obtained its desired territorial concessions and indemnities after a series of failed attempts by French forces raised in Paris to break the siege.[8] However, Falkenhayn's goal was not to attack into Russia, besiege Moscow, and dictate terms. Rather, his hope was that Russia would accept a separate peace that enabled Germany to

achieve through diplomacy what it could not militarily. The Germans would return captured territory and, in exchange, Russia would leave the Entente.[9]

Falkenhayn had developed and tested a new theory of warfare for the German army by 1916. Given a two-front war, facing superior resources, and unable to achieve strategic penetration, the German army would organize and equip itself for violent, firepower-based surprise attacks on narrow fronts. The military effect of these attacks would inflict disproportionate casualties on defending and counterattacking forces, draining the enemy's ability to conduct military operations. Unable to resist any further, the enemy would capitulate and negotiate a limited settlement that offered more—and at a lower cost—than could be obtained militarily.

Verdun

For Falkenhayn, Britain was Germany's bête noire. In his words, England sought "the permanent elimination of what seems to her the most dangerous rival" and "Germany can expect no mercy from this enemy, so long as he retains the slightest hope of achieving his object."[10] The problem, of course, was that Germany had no way to get to Britain directly. However, without its continental allies, Britain had no means to invade Germany. Thus, the German war aim in 1916 was to split France from the Entente by making the costs of war intolerable. As Falkenhayn put it, "[i]f we succeeded in opening the eyes of her people to the fact that in a military sense they have nothing more to hope for, that breaking-point would be reached and England's best sword knocked out of her hand."[11] The trick then, was to induce that sense of helplessness by getting the French army to batter itself to death.

The French salient near Verdun seemed to offer an ideal venue for this project. An artifact of the 1914 fighting, it jutted from the hills around Verdun toward the northwest, past the line of forts anchored by Fort Douaumont, and into a series of woods and low hills bisected by the Meuse River. Thus, the French position was exposed to German forces on three sides and could only be reinforced from the rear, not the flanks. Moreover, Verdun held an important place in the French imagination, and they could be expected to go to great lengths to retain this object of symbolic importance.[12] Finally, French forces around Verdun had been thinned out to support efforts elsewhere on the front, and so were especially susceptible to Falkenhayn's firepower-based methods.[13]

In keeping with his theory of warfare, Falkenhayn prepared fighting positions and massed artillery for the battle but did not move his formations to their final positions until days before the assault. He launched diversionary attacks elsewhere along the Western Front, and he kept his exact intentions secret from the senior commanders who were to lead the offensive. These initiatives were successful. Unfortunately for the Germans, severe weather delayed their attack for ten days just as the troops moved to their jumping off points, giving the French valuable intelligence about the location of the attack. The French were thus able to advance the remediation of Verdun's defense that had begun just weeks before and to begin moving reserves into place.

Due to Falkenhayn's penchant for military deception, though, it was not clear to the French high command that Verdun was the main effort until the attack began on 21 February 1916. As it had in the east, the concentrated, echeloned, and carefully allocated German artillery decimated the French defenses, firing one million shells on the first day of the battle alone.[14] The overwhelming infantry assault, employing flamethrowers for the first time, routed the front lines and the reinforcements that were thrown piecemeal into the battle. And, with luck, Fort Douaumont was left virtually unmanned and was captured easily by a small German detachment. In the face of the German onslaught, the French seriously considered abandoning their positions on the east side of the Meuse River and giving up the fort system around Verdun.

However, as brutally as it began, the German advance stalled. The artillery that was to move up in support of the advancing infantry was bogged down in the wet fields that it had just plowed with its initial bombardment. The infantry came under withering shellfire from French batteries firing from reverse slopes of hills along the west bank of the Meuse, where French observers had a clear view of German positions. Local French counterattacks inflicted severe casualties, and the French line began to receive steady reinforcements along a single gravel road that came to be known as Voie Sacrée—the Sacred Way.

Falkenhayn's failure to fully communicate and receive the support of his subordinate commanders

created serious difficulties. While keeping his intentions to himself was clearly a successful approach to military deception, in the operation itself the German army remained focused on the capture of Verdun as an end, not a means. Rather than fall back to more desirable defensive positions at either the rear slopes surrounding the city or the hills around Fort Douaumont, the German forces remained exposed on the plains and slopes in front of Verdun. Irrespective of setbacks, the assault continued, even as it failed to achieve Falkenhayn's true ends—creating a favorable loss ratio with French forces that would cause the collapse of French will while preserving the German ability to continue operations. These ends could be achieved either by blunting French counterattacks at Verdun or by inducing them elsewhere; they could not be achieved by costly assaults from exposed positions by German forces.[15]

(Photo courtesy of Vikidia)

Transport vehicles were on the move day and night ferrying troops, armaments, and supplies to the Verdun battlefield after March 1916 along the forty-five miles of the Voie Sacrée, or Sacred Way.

Another challenge created by Falkenhayn's theory of warfare was that the process that translated military effects on enemy forces into supposed evidence of enemy capitulation that were difficult to observe. The enemy's will was not expected to slowly and visibly bend; it was expected to snap. Thus, even the most strenuous act of resistance might be the "last gasp" that preceded mass surrenders, troop rebellions, popular revolts, and a willingness by the national leadership to come to terms rather than accept further punishment. (This, incidentally, was the pattern observed in the final days of the German army in 1918, which launched a massive breakthrough offensive led by Falkenhayn's successor before collapsing, just as Falkenhayn predicted.)

In the absence of the ability to observe the state of the enemy's resolve, German analysts were forced to focus on the observable mechanism that preceded it—in this case, the destruction of enemy forces. Unfortunately, both the Germans and the French tended to overestimate the level of casualties they were inflicting.[16] As a result, both sides believed that the military effect was greater, the enemy residual military capability much lower, and capitulation favorable to the desired political outcome much closer than it actually was.

Eventually, the German army was too attrited to maintain its position at Verdun and was forced back into the hills north of Fort Douaumont. Elsewhere, the Entente mounted offensives of their own, including an attack at the Somme, which should have been impossible had the French forces been as near to collapse as Falkenhayn had predicted. In addition, the Russian army had recovered from the previous year's losses and was advancing against Germany's Austro-Hungarian allies. Consequently, the Kaiser replaced Falkenhayn, who was unable to show results from the enormous

costs that Germany had borne at Verdun, and Gens. Hindenberg and Ludendorff took over the German war effort.

(Photo courtesy of Wikimedia Commons)

Exhausted French troops in the central corridor of Fort Vaux, February 1916. In June 1916, Fort Vaux became the second fort to fall in the Battle of Verdun. At that time, it was virtually undefended due to the scarcity of resources.

The Power of Theory

The framework for analyzing theories of warfare presented at the beginning of this essay is a powerful lens for understanding why militaries do what they do. The theory of warfare held by the German army prior to 1914 was rooted in its 1870 victory and dictated that the goal of a military is the destruction of the enemy in a single battle, characterized by decisive maneuver, after which the winner dictates terms to the loser. In the context of Germany's strategic givens, this resulted in the Schlieffen Plan and the attempt to envelop the entire French Army. By 1916, Falkenhayn replaced this theory with the idea that military forces destroy enemy formations in a series of surprise attacks, limited breakthroughs, and robust defenses. Once the enemy is incapable of achieving its aims militarily, space opens for a diplomatic settlement. This approach succeeded in the east during 1915, and it became the basis for the German attack on Verdun in the west.

In addition to explaining military behavior, understanding a military's theory of warfare also enables one to see where and how it might fail. At Verdun, the inability of the artillery to advance quickly over heavily shelled terrain meant the attack stalled, resulting in the Germans losing the overwhelming firepower advantage the theory demanded. Further, the need for secrecy to gain the advantages of surprise prevented clear communication of commander's intent from Falkenhayn to his subordinates. Once the attack stalled in unfavorable terrain, commanders continued to press forward with the terrain-oriented purpose of seizing Verdun as opposed to Falkenhayn's force-oriented objective of obtaining desirable loss-exchange ratios. Finally, because the theory posited an unobservable link between residual military capability and political capitulation, the German staff relied on measurements of French casualties to estimate the remaining French national will. Both their casualty estimates and their beliefs about French willpower were in error, and in fact, it was not until the massive casualities suffered in the aftermath of the 1917 French offensive that French units began to mutiny.

America's Theory of Warfare

German theories of warfare are useful in understanding the nature of the German army, its employment in World War I, and, importantly, the deficiencies in the German theory of warfare that led to poor strategic decision making and a costly defeat at Verdun. With those

lessons in mind, let us turn to the American theory of war and consider its implications for the future.

The *2015 National Military Strategy* divides the world into state adversaries and violent extremist organizations (VEOs). In the document, these are depicted as two ends of a spectrum, each requiring a different set of mechanisms to address them. State adversaries are subject to "deter, deny, defeat," while VEOs receive "disrupt, degrade, defeat."[17] However, these alternative approaches are actually two expressions of the same underlying theory—a theory that looks a lot like Falkenhayn's.

The *National Military Strategy* states that if America or its interests are attacked by a state adversary, the American military "will respond by inflicting damage of such magnitude as to compel the adversary to cease hostilities or render it incapable of further aggression. … Denying an adversary's goals or imposing unacceptable costs is central to achieving our objectives."[18]

The *Joint Operating Concept* suggests the American military will achieve this military effect through globally integrated operations—rapidly combining and deploying capabilities across settings and services traditionally considered discrete.[19] In the *Army Operating Concept: Win in a Complex World, 2020–2040,* this is expressed through the idea of "joint combined arms operations" that "present the enemy with multiple dilemmas" to "compel enemy actions" by "putting something of value to them at risk."[20] These dilemmas, combined with American capacity for rapid maneuver, "dictate the terms of operations and render enemies incapable of responding effectively."[21]

The *Naval Operating Concept for Joint Operations* supports such globally integrated operations through "sea strike" (offensive power from the sea), "sea shield" (sea-based defensive systems), and "sea basing" (logistic support for expeditionary forces). In time, these capabilities will "project increasingly decisive offensive power" and "enhance homeland defense, maintain freedom of the seas, assure access through strategic chokepoints and in the contest littorals, and project defensive power deep inland."[22]

The Air Force captures this idea under the aegis of "operational agility," which will "place an adversary on the 'horns of multiple dilemmas' by swiftly applying different strengths to produce multiple approaches."[23] This has the effect of enabling the Air Force to "leverage multidomain standoff strike capabilities whose effective ranges exceed those of an adversary's defensive systems to engage high-value, time-critical, and highly defended targets."[24]

At both the joint and service levels, the U.S. military has determined that it will be compelled to face diverse threats in a resource-constrained future, and that it must engage those threats by organizing and equipping itself to operate in tailor-made, widely dispersed formations that access a broad suite of capabilities and respond to circumstances so quickly as to inflict enormous harm on enemy forces. In the face of violence, the enemy finds itself either militarily unable to achieve its aims or so brutally punished that the aims no longer seem worthwhile. The United States also intends to employ this theoretical mechanism against VEOs, albeit at a reduced level of violence. Lethal means are used to destroy VEO formations and prevent them from achieving their military aims while nonlethal support to state capacity and development makes those aims seem less worthwhile to potential recruits.

If these are the givens, the friendly efforts and the military effects postulated by our theory of war, what kind of political outcome do we seek? Implicit in the military effects that are articulated above is the idea that we alter adversary behavior but achieve neither total capitulation and occupation nor long-term resolution. Conflict will be short and sharp, and the goal of the United States is to impose costs so high as to lead an adversary to cease their undesirable behavior or live with a degraded capacity for further action. While we may use decisive maneuver as a strategic means, our *Joint Operating Concept* implies that we no longer expect it to result in a battle of annihilation that resolves a long-term security competition.

Conclusion

In many regards, the contemporary American theory of warfare is much like Falkenhayn's. We will use surprise and agility to mass capabilities and achieve a military result that we can translate into an improvement in the political environment without achieving a decisive victory that eliminates our strategic competitors. Like Falkenhayn, we are adapting to the new strategic givens in our environment: It is simply too costly, in an era with both nuclear weapons and nearly ubiquitous durable small

arms, to invade and occupy other countries for the long-term. As a result, we will fight, we will leave, only to fight again.

Given these similarities, it is worth considering how Falkenhayn's apparently prudent, combat-tested theory of warfare led to the failure at Verdun and how we can avoid similar catastrophes in an era of limited war. The dangers are threefold: We may have made faulty assumptions about the terrain, the adversary, and ourselves.

The terrain is the danger to which we are most attuned. Considerable energy is dedicated in each of the *Operating Concepts* to describing global trends regarding urbanization, youth, computers, and military technology. However, if we do not realize that we have adopted a theory of limited war for limited aims, we may be planning to undertake operations that we have no need to actually undertake; for example, our theory may not necessitate fighting in or occupying a megacity. Prudence demands we reexamine future trends in the light of how we intend to actualize the theory of warfare we have adopted, lest, as in Verdun, our wheels get bogged down in a muddy field of our own making.

Like Falkenhayn, our theory of warfare relies on either rendering an adversary prostrate or raising the costs of further conflict to unacceptable levels. Both conditions require a clear understanding of how the adversary thinks about cost and how to manipulate those costs, and both may be hard to observe in real time. Strategic land power is one of the only mechanisms that signals U.S. intentions to continue a campaign until our aims are met.[25] However, if the adversary is not completely defeated (as in Russia in 1915), then we may find ourselves conducting retrograde operations against reconstituting force—operations that we have not considered or rehearsed in our current doctrinal approach. Moreover, if we do not completely destroy the adversary military, but can only operate on the adversary's will (as in our campaigns against VEOs), we may find ourselves, like Falkenhayn, hoping that victory is still just around a corner we never turn.

Finally, just as Falkenhayn's failure to clearly communicate his intent at Verdun and its place in his overall theory of warfare led to subordinate commanders acting in contravention to the logic of that theory, so too are we in danger of failing to communicate across echelons how the U.S. military will operate in the future. The U.S. theory of warfare seems to dictate a high-speed, aggressive, destructive campaign to damage the adversary—it does not envision total defeat, occupation, social reorganization, and withdrawal. However, the latter is precisely how we talk about campaign planning and how we train staffs and tactical formations. Consequently, it will be difficult to achieve the strategic ends envisioned by the *National Military Strategy* and the *Joint Operating Concept* using the doctrinal means presently at our disposal. This disconnect is incredibly dangerous. Like Falkenhayn's lieutenants, our commanders of the future will be trained to keep pressing the attack when our policymakers expect them to withdraw to defensible positions, and in doing so, may unravel the entire raison d'etre of the operation.

It is difficult to imagine a place that better embodies the horror of modern war than Verdun. By the end of the battle, the ground was so thick with bodies that each shell stirred up new corpses even as it buried the old. Men fell to the bottom of shell holes on their way to the front and drowned trying to scrabble up the muddy sides. The infantry lay helpless in the middle of an artillery duel that lasted months. The fight for Fort Vaux unfolded in pitch-black hallways, behind barriers made of the dead and volleys of grenades. Phosgene was used for the first time. Even after almost one hundred years, Verdun stands as an enduring monument to the fundamental violence of using machines to tear human beings apart.

Given the extraordinary levels of violence, it is reasonable to ask what anyone hoped to achieve that could be worth that cost. The answer, in the eyes of Falkenhayn, was the destruction of the French army as a fighting force. If it depleted its reserves, sapped its will, and gave up on military means to recover its lost territory, Germany would be able to survive the war. However, because employment of his theory at Verdun failed to properly account for the ground, was inadequately shared with the officers under his command, and overestimated the impact the battle had on the enemy, Verdun ended in a German failure. Given the extraordinary demands future warfare in a complex world, it is imperative that we do not make the same mistakes. ■

Biography

Maj. Robert P. Chamberlain, U.S. Army, is an operations research/systems analysis officer at the Future Warfare Division of the Army Capabilities Integration Center at Fort Eustis, Virginia. He holds a BA from the University of Kansas, an MSc from Oxford University, and a PhD from Columbia University. His assignments include deployments to Iraq, command in the 1st Infantry Division, and teaching at the United States Military Academy.

Notes

1. This is connected to a larger trend in German strategic thought, the belief in *Vernichtungsschlacht*, or "The Battle of Annihilation." For the role of this concept in pre-World War I planning, see Jehuda L. Wallach, *The Dogma of the Battle of Annihilation: The Theories of Clausewitz and Schlieffen and Their Impact on the German Conduct of the Two World Wars* (Santa Barbara: Praeger, 1986).

2. This concept of operations, known as the Schlieffen Plan, is well documented and widely discussed. A particularly readable text about the opening phase of the war is Barbara Tuchman, *The Guns of August* (New York: Presidio, 1962). The authoritative text on the military aspects of the campaign was first published in 1935 and has been rereleased under a new imprint: Sewell Tyng, *The Campaign of the Marne* (1935; repr., Yardley: Westholme Publishing, 2007).

3. Tyng, *Marne*, 25–33. Chapter 3 offers comparisons of the French and German armies and an excellent overview of their organization, equipment, and operations.

4. While this essay limits itself to the German side of the conflict, for an excellent account of French strategic evolution, see Robert A. Doughty, *Pyrrhic Victory: French Strategy and Operations in the Great War* (Cambridge, MA: Harvard University Press, 2005).

5. Robert T. Foley, *German Strategy and the Path to Verdun* (Cambridge, UK: Cambridge University Press, 2005). The roots of this "exhaustion strategy," or *ermattungsstrategie*, is the subject of chapter 2 of Foley's excellent account of Falkenhayn and his place in the larger debates among prewar German strategists.

6. Ibid., 140.

7. Ibid., 153.

8. Alistair Horne, *The Fall of Paris: The Siege and the Commune 1870–71* (1965; repr., London: Penguin, 2007).

9. Foley, *German Strategy*, 146.

10. Erich von Falkenhayn, *The German General Staff and Its Decisions, 1914–1916* (1920; repr., London: Forgotten Books, 2012), 240.

11. Ibid., 249. While his memoirs are authentic, the preceding two passages are drawn from a letter he says he delivered to the Kaiser around Christmas 1915. No other evidence of this document has emerged, and while his memoirs likely reflect his thinking at the time, historians now believe the Christmas Memorandum to be a literary device. See Foley, *German Strategy*, 188.

12. Paul Jankowski, *Verdun: The Longest Battle of the Great War* (Oxford, UK: Oxford University Press, 2014), 14–15. Jankowski, a revisionist historian, offers an alternative view, arguing that Verdun only became especially important symbolically after the battle and was not particularly important beforehand.

13. Alistair Horne, *The Price of Glory: Verdun 1916* (1962; repr., London: Penguin, 1993); Jankowski, *Verdun*, 41. While his account of Falkenhayn has been superseded by later scholarship based on the release of German records captured by the Soviets, Horne's account of French preparations and behavior around Verdun remains eminently readable.

14. Foley, *German Strategy*, 10.

15. Jankowski, *Verdun*, 41.There remains scholarly debate about what, precisely, Falkenhayn intended to happen, and there is certainty that there was debate among his subordinates.

16. Foley, *German Strategy*, 235-36.

17. U.S. Joint Chiefs of Staff (JCOS), *The National Military Strategy of the United States of America 2015* (June 2015), 6, accessed 12 April 2016, http://www.jcs.mil/Portals/36/Documents/Publications/National_Military_Strategy_2015.pdf.

18. JCOS, 7 and 12. This language also appears on page 11.

19. JCOS, *Capstone Concept for Joint Operations: Joint Force 2020* (10 September 2012), 4, accessed 12 April 2016, http://www.dtic.mil/doctrine/concepts/ccjo_jointforce2020.pdf.

20. U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win¬ in a Complex World, 2020–2040* (Fort Eustis, VA: TRADOC, 31 October 2014), iii and 18, accessed 12 April 2016, http://www.tradoc.army.mil/tpubs/pams/tp525-3-1.pdf.

21. Ibid.

22. U.S. Navy, *Navy Operating Concept for Joint Operations* (May 2003), 13–14, accessed 20 April 2016, http://www.dtic.mil/docs/citations/ADA524820.

23. U.S. Air Force, *Air Force Future Operating Concept: A View of the Air Force in 2035* (September 2015), 7, accessed 12 April 2016, http://www.af.mil/Portals/1/images/airpower/AFFOC.pdf.

24. Ibid., 31.

25. Dianne Chamberlain, *Cheap Threats: Why the United States Struggles to Coerce Weak States* (Washington, DC: Georgetown University Press, 2016).

Everything I Never Wanted to Learn about the Network and Where We Might Go from Here

Lt. Col. J.B. Shattuck, U.S. Army, Retired

While establishing a communications network for an exercise at the Maneuver Center of Excellence on Fort Benning, Georgia, I had to roll up my sleeves, bite the bullet, and learn more than I, or most of my maneuver brethren, would ever care to learn about the current state of communications. Like many of my colleagues, I just want communications to work, and I do not (or did not) care why or how. However, the truth is that, currently, networks simply do not work (and will not work) in the way many of us expect. But, once we learn some simple fundamentals, there is potential to make networking, the verb, a reality.

The Laws of Physics and the Soldier Radio Waveform (SRW)

Radios can transmit a lot of information over a short distance or a little information over a long distance. Period. This is due to the way a radio wave carries information and propagates. Iterative technology advances and longer antennas will not change this simple rule. We can maximize the amount of data and range of a given waveform for maximum benefit only up to the limit of that particular waveform. This is important to point out as it requires a radio optimized for performance to get the most out of a limited range for a networking waveform.

Networking waveforms carry a lot of information and are short range due to the physics involved; there is no overcoming this. On the other hand, long-range waveforms, such as the SINCGARS (single-channel ground and airborne radio system) waveform we have been using for years, carry little more than voice and some very limited data. As a result, it is, technically, possible to establish local networks around platoons, possibly around entire companies, and certainly around company and higher headquarters. However, the range of these local networks is likely to be measured in meters, not kilometers. Another type of waveform with more range is required to bridge the gaps between local networks using voice, not data, due to the distance the waveform needs to travel.[1] Consequently, the idea that we can populate a single, Internet-like unifying network with our data for all to see in real time is unattainable.

A brigade commander will not routinely see the sensor feeds going to squad leaders, unless there is a preplanned event and the resources are in place to relay that signal. The relay resource most often mentioned is an unmanned aircraft system (UAS), which is touted by many as the answer to the gaps of local networks as part of the "aerial layer."[2] This may be effective given a point-to-point relay of a signal, but this fills just one gap from one local network to one other. There are, however, other significant shortcomings with this aerial layer concept.

The Myth of the Aerial Layer

While it is true that a signal may be relayed from one point to another over substantial distance using a UAS, it is not the panacea that some are led to believe.

Army communications architecture slides often show the UAS with lightning bolts linking a platoon to a company to a battalion to a brigade, and some even to a division. Normally, these slides show one representative platoon, although actually there are many, and it would be some kind of extraordinary platoon that would operate on the division's network. Such connectivity would need preplanning in order to program all the radios required to relay the signal (without exceeding the capacity of the network). Recall that with the short range of the networking radios, there is no single unifying network, only local networks operating on their own frequencies. In a three-brigade division, there could be twenty-one battalions, eighty-four companies, and two hundred fifty-two platoons. This would require a substantial allocation of the available UASs to be dedicated to relay company, battalion, and division networks.

This presents a large problem set. However, the scale and scope of the problem may often be glossed over in the reputed solution because even if a super-communication UAS is developed that relays multiple frequencies at once, it will still be subject to the same duration and weather constraints and would be vulnerable to counter-UAS. In addition, there is still the limitation of carrying the network's capacity, which would be challenged to support the number of radios required by a company's network, let alone a division's.

A soldier uses a digital Rifleman radio, part of the Joint Tactical Radio System Handheld, Manpack, and Small-form Fit (HMS) program, during a network integration evaluation 8 April 2014. The HMS program provides a radio waveform-enabled "gateway" between the Rifleman radio and the Army's satellite communications backbone, known as the Warfighter Information Network-Tactical.

(Photo by Claire Schwerin, PEO C3T, U.S. Army)

The Current State of the Army's Tactical Radios

At present, the tactical radio cure to the networking dilemma is not encouraging. Maj. Gen. H.R. McMaster, then commander of the Army Maneuver Center of Excellence at Fort Benning, Georgia, was quoted in a June 2015 article about problems with the AN/PRC-155 Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small-form Fit (HMS) radio set:

> The Maneuver Center of Excellence considers the dismounted HMS Manpack radio unsuitable for fielding to brigade combat teams .... A radio that is heavier and provides less range while creating a higher logistics demand does not make our units more operationally capable. Additionally, any radio that places our soldiers at risk of being burned is unacceptable.[3]

According to the same 2015 article, from the Defense Industry Daily website, HMS Manpack has many problems:

> The Radio's seventeen pounds makes it twice as heavy as previous SINCGARS radios, its effective range is less than half as far (3 km vs. 7 km), its two batteries last less than 20 percent as long (six hours vs. thirty-three hours), and its user interface is an impediment. Adding to the fun, overheating is hazardous to the carrying soldier if it's taken out of the case against recommendations.[4]

However, this assessment is generous compared to the reality. The three-kilometer range is a stretch; perhaps the radio could achieve that distance in the open deserts at White Sands Missile Range, New Mexico, or Fort Bliss, Texas, but not in the forested hills of Fort Benning, Georgia. It would be fortunate to get three hundred meters in the complex terrain the infantry often finds itself in.

So, in August 2014, the Maneuver Center's Maneuver Battle Lab began to explore networking concepts and to exercise a cellular network and lower standards of encryption for tactical communications. For many, it was assumed network integration exercises (NIEs) would work out the bugs of the radio over time. However, the director of operational test and evaluation, J. Michael Gilmore, found the AN/PRC-155 was "not operationally effective when employed in dismount operations" at NIE 14.2.[5] Likewise, he commented on the Rifleman radio during the same NIE:

> When employed during the first phase of Nett Warrior initial operational test and evaluation at NIE, the AN/PRC-154A Rifleman [radio] provided good voice communications 'until a terrain feature blocked line-of-sight,' and 'soldiers had problems with the radio battery,' including high battery temperatures that 'caused first-degree burns and discomfort. Sixty percent of the soldiers reported that the temperature was in excess of 120 degrees Fahrenheit.'[6]

In January 2015 the Army responded to the report, defending both the radios and results of NIE 14.2, asserting that the Manpack "was successfully used to make voice calls and transport data throughout the test, with feedback indicating that the radio supported communications needed to accomplish the mission."[7] Obviously, these two conflicting positions indicate a great disconnect with the development of our family of networking radios.

The Fact of the Matter

The physics of the problem dictate that a networking radio is going to be short range. Unfortunately, when authorities knowledgeable of the science of radio waves take issue with the radio, they are dismissed as having a lack of understanding regarding its range limitations. Consequently, such dismissal represents a missed opportunity to address root-cause problems.

Yes, the networking radio needs to be short range, but not as short as we are currently experiencing; it merely needs to be optimized for the networking waveform currently being used. Any new equipment or technologies are going to have some bugs to work out, but changing to longer antennas is only a helpful step toward a greater solution.

To further compound the networking radio issue, in November 2014 the Army reported that the vehicle-mounted Manpack met the mounted-leader requirements, which account for 64 percent of total program requirements.[8] The report indicated that the Army would review requirements and technology to improve the radios for the remaining 36 percent

(Graphic by Arin Burgess, *Military Review*)

Figure 1. JTRS Legacy Waveforms, Ad Hoc Networking Waveforms, and Network Enterprise Services

"associated with dismounted operations."[9] For context, in the most current active and National Guard brigade-combat-team numbers, there are thirty-five infantry brigades, sixteen armored brigades, and nine Stryker brigades. Yet, even within armored and Stryker brigades, infantry squad leaders up through company commanders have to be prepared to dismount. So, how then does the vehicle-mounted Manpack radio meet 64 percent of the program requirements? Perhaps it is time to update the concept of operations that drives analysis of leader radio requirements.

Additionally, the Army neglects to adequately address the radio's user interface issue with the range issue. One defense-oriented website, the Defense Industry Daily, reported, "Its user interface is an impediment."[10] Indeed. To use the radio system, the network is built on a laptop first with a name assigned to each radio using an ISP-equivalent naming convention. Then, the laptop joins with each radio so that the network program can be physically uploaded.

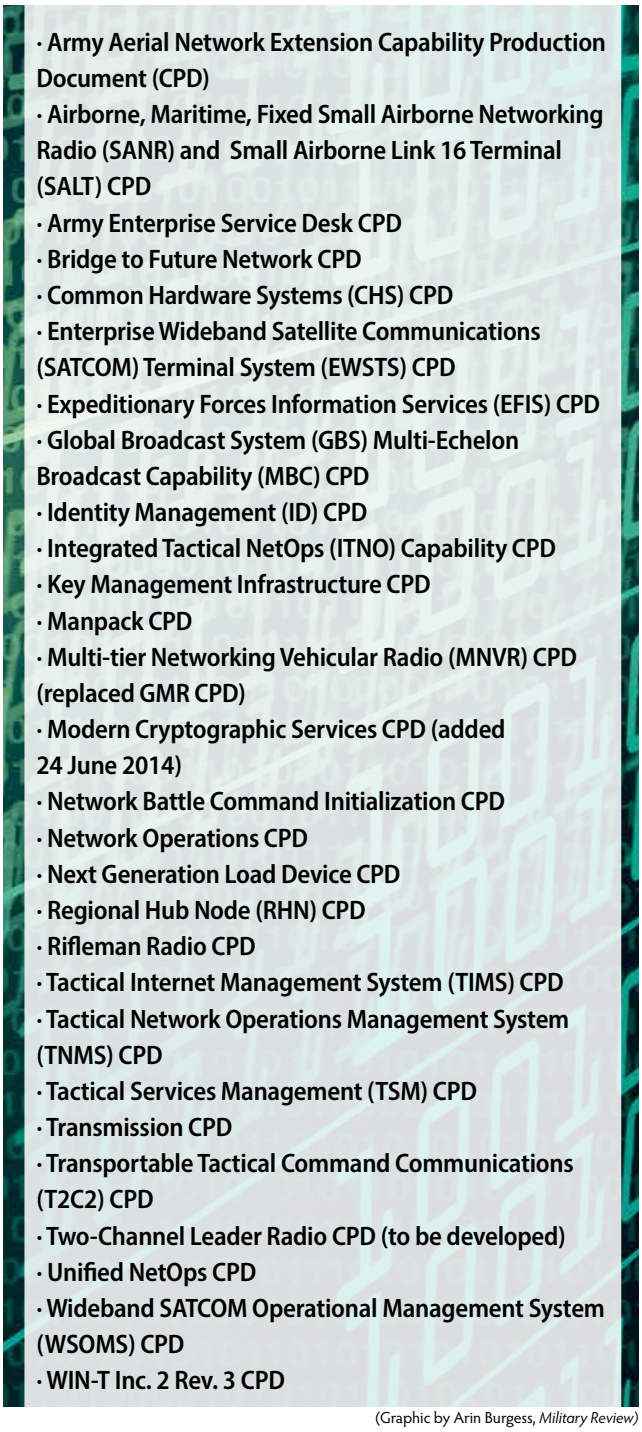
This complex and time-consuming task becomes operationally untenable when the task organization changes during an operation. To attach or detach an element, or to communicate with a diverted enabler, is not a matter of simply uploading the network to new users. Instead, the system is designed in such a manner that it must be completely rebuilt and uploaded again into every radio in the network.

Fortunately, every radio in the network is actually not very many. Though the carrying capacity of the network—the number of radios on the same frequency communicating and networking with each other—is advertised to be a maximum of forty-five, it is necessary to keep the number of networked radios to fewer than twenty-eight. More than that begins to bog down the data transfer rate. And, with more than thirty-five radios on the network there is a danger of crashing it.

How has the Army come to a point where our twenty-first-century radio is twice the weight, half the range, a battery burden, and a burn hazard as compared to our twentieth-century radio? The answer resides in well-intentioned but overly complicated requirements that result in industry trying to comply with exceedingly complex JTRS standards and National Security Agency (NSA) Type 1 encryption.

JTRS Standards and NSA-Certified Encryption

Compatibility with legacy systems is among the requirements that industry must accomplish to meet the JTRS standards and field a new radio. Legacy radio



(Graphic by Arin Burgess, *Military Review*)

Figure 2. Cyber Common Operating Environment Requirements Documents

compatibility requires that the radio must be capable of operating on fourteen different legacy waveforms (see figure 1, page 91) In addition, the industry must sort through twenty-eight requirement documents that cover all the different communications applications (see figure 2). This well-intentioned requirement to ensure compatibility directly results in a complex radio and is likely the reason for the extra weight, overheating, and battery drain issues associated with the radios examined so far.

Over the life of the network, overly optimistic development decisions, compromises, and congressional input have affected how the radios are developed and implemented. For example, the Rifleman radio is now used as a leader radio; that was never its intended role.[11]

Further complicating the radio is the requirement for top-of-the-line, NSA-certified encryption. However, industry representatives indicate that an advanced encryption standard (AES)-type encryption is almost as secure, and would result in far less of an engineering challenge.

How much more secure is the NSA Type 1 versus AES? Is any encryption completely trusted, or would better radio procedures make the risk worth the payoff of a more capable radio? Key leaders at the Maneuver Center seem to think so. Bottom line, the radio now fielded seems more optimized for compatibility and security, not actual performance.

Challenges of Cellular and Wi-Fi Networks

Turning to other issues complicated by similar challenges, there is no magic to cellular and Wi-Fi. They are waveforms capable of moving large amounts of data but are still subject to the laws of physics previously described: high data, short range. Fortunately, cellular networks in our everyday lives function effectively because a cellular infrastructure surrounding us supports them. The same is with Wi-Fi; think of the Wi-Fi hotspots in our lives and the short ranges associated with them. A Wi-Fi network that establishes itself around the battalion tactical operations center (TOC) has great potential to move large amounts of data, but only for those present at the TOC.

Setting aside for a moment the proliferation of counter-radio electronic-warfare devices that deliberately jam cellular signals, cellular networks have all the performance wanted. However, a robust infrastructure must be emplaced and secured to make a tactical cellular network possible.

Where Do We Go From Here?

From a pragmatic view, I believe the solution to the Army's current radio dilemma requires four actions.

1. The Army must acknowledge what is and what is not possible according to the physics of radio waves. A single, unifying, Internet-like network is not possible; however, local networks are possible. Consequently, data recovery missions can be launched from higher to lower positions in order to push and pull data to and from the local networks and populate the higher networks. Irrespective, there will be delays in data communications using such networks that will preclude real-time transfer. Therefore, voice communication will have to suffice to bridge the gap.

2. The Army needs to adjust the requirements for its tactical radios. A single-purpose radio optimized for performance is needed, with a networking waveform on one side and a long-range waveform on the other, cross-domained. If SINCGARS is used as the long-range waveform, then we will have compatibility with much of our legacy systems. This radio should also be AES standard encrypted, and have auto affiliation built in.[12]

3. The Army should explore the use of networking radios developed by U.S. manufacturers to platoon-and-below-level operations for sale on the international market. Radios sold by these manufacturers have less stringent security requirements but may still be acceptable for those that operate with information that is often fleeting and perishable. These radios are not burdened with JTRS requirements, which result in radios too complicated to build and operate.

(Photo by Claire Schwerin, PEO C3T, U.S. Army)

Soldiers from the 2nd Brigade, 1st Armored Division at a company outpost during the Army's second Network Integration Evaluation, NIE 12.1, at White Sands Missile Range, New Mexico, and Fort Bliss, Texas. The NIEs are helping bring greater network connectivity to the company level so soldiers can communicate through voice, data, images, and video, even in complex terrain.

4. The Maneuver Center of Excellence and the Cyber Center of Excellence should come together to develop or update a concept of operations for an infantry brigade conducting combined-arms offensive operations. I recommend a movement-to-contact scenario to stretch the distances between units a bit more than may be the case in other operations. A concept of operations should provide an opportunity to

map out exactly who is networking with whom, when, with what radio, and on which net. We should start at platoon level (not just one representative platoon) and work back to brigade.

Conclusion

Communication networking can be realized for our forces, but we need to be honest with ourselves concerning what is possible. Consider a scenario where company commanders arriving at the battalion TOC for an orders brief find their tablet already updated with the order and graphics via the battalion TOC Wi-Fi signal by the time they grab their cup of coffee and sit down. Likewise, the common operational picture display inside the TOC is now more current, having downloaded the information from the company commanders. The supporting Apache aircraft can upload the unit's position location information and know exactly where the friendly forces are. This does not change the company commander's responsibility to inform the flight lead; it just makes their job that much quicker and easier. UAS flights can come and go on data-push missions between command posts, including adjacent units. Auto affiliation can make task organization changes and integration of enablers seamless. The "take" from the robotic sensors will be a topic for discussion among the squad leaders as they conduct priorities of work.

Ultimately, the networking efforts will likely include a mix of cellular, Wi-Fi, SRW, and now airborne and wideband networking waveforms, along with a long-range waveform to maintain at least voice connectivity.

To get there, we have to understand that lots of information only travels a short way, and a little information can go a long way. We have to optimize our radios for performance, not compatibility and security. We have to integrate into our communications systems the means to support changes to task organizations and the movement of enablers across nets. Finally, we have to work in the realms of possible, and follow the physics to workable solutions. ■

Biography

Lt. Col. John B. (J.B.) Shattuck, U.S. Army, retired, is the program manager of the Squad Foundation of the Decisive Force, Focused Assessment Exercise, at Fort Benning, Georgia. He holds a BS from the United States Military Academy and an MBA from Indiana Wesleyan University. During his military career, he deployed to Iraq twice, and to Saudi Arabia, Somalia, Haiti, and Bosnia.

Notes

1. A small amount of data over a single-channel ground and airborne radio system (SINCGARS) network is possible and currently done, just not on the scale of a data-networking radio. I use SINCGARS as an example of a longer-range waveform due to its familiarity.

2. Joint Chiefs of Staff, *Joint Concept for Command and Control of the Joint Aerial Layer Network* (Washington, DC: U.S. Government Printing Office, 20 March 2015), 9.

3. Maj. Gen. H.R. McMaster, quoted in Defense Industry Daily staff, "Soldier Battle JTRS: The HMS Radio Set + SANR," Defense Industry Daily website, 18 June 2015, accessed 3 March 2016, http://www.defenseindustrydaily.com/soldier-battle-jtrs-the-hms-radio-set-07536/.

4. Defense Industry Daily staff, "Soldier Battle JTRS: The HMS Radio Set + SANR."

5. J. Michael Gilmore, quoted in Ellen Mitchell, "Manpack, Rifleman Radios Have Heat, Reliability Problems," Inside Defense website, 19 January 2015, http://insidedefense.com/node/166763 [login required].

6. Mitchell, "Manpack, Rifleman Radios."

7. Paul Mehney, quoted in Mitchell, "Manpack, Rifleman Radios."

8. Ellen Mitchell, "Army Pondering Two Versions of Manpack in Radio Acquisition," The Insider (newsletter), Inside Defense website, 9 March 2015, http://insidedefense.com/node/167925 [login required].

9. Ibid.

10. Defense Industry Daily Staff, "Soldier Battle JTRS."

11. U.S. Army Training and Doctrine Command Capability Manager, Brigade Combat Team - Mission Command (TCM BCT/MC) website, 30 December 2014, accessed 29 March 2016, http://www.benning.army.mil/mcoe/CDID/tcm-bct-mc/index.html.

12. Auto affiliation is what we do each time we go to our local coffee shop, turn on our tablet, phone, or laptop, scan the available networks, and then connect to the network. We do not need to be concerned that units will not be able to communicate after a task organization change, or that the Apaches vectored to the company in contact will not be able to communicate with the company commander.

(Photo by Senior Master Sgt. Adrian Cadiz, U.S. Air Force)

Secretary of Defense Ash Carter (left) and Philippine Secretary of National Defense Voltaire Gazmin shake hands on a Marine Corps V-22 Osprey as they depart the USS *John C. Stennis* 15 April 2016 after touring the aircraft carrier in the South China Sea. Carter visited the Philippines as part of an effort to solidify the rebalance to the Asia-Pacific region.

The Danger of Delusions—and How to Prevent Them from Causing Conflict

A Perspective on China

Col. Michael J. Forsyth, U.S. Army

In 2015, I had the opportunity to host a senior Chinese officer during his visit to the United States. During our time together, he continually expressed that the United States should have respect for China, and that it should not pursue a policy of containment. No matter the topic of discussion, the official always circled back to this theme. It seemed to me that this perception of persecution bordered on paranoia.

Assuming the Chinese officer's statements represented the views of his country's leaders, I was reminded of the historical situation with Imperial Germany before World War I. An unreasonable fear of encirclement influenced Germany's political and military class, a mentality that contributed to the start of World War I. I wondered if modern Chinese leaders, like German leaders of the past, were beginning to believe other countries in their region were attempting to encircle them. If so, historical precedent suggests that such paranoia on the part of China could have grave consequences, particularly if China overreacted to perceived threats to its sovereignty.

To avoid such misunderstanding and the consequences that might follow, the United States and its Asia-Pacific partners must work to debunk the notion—where it exists among Chinese leaders—that the United States and its partners are attempting to contain China. The United States can accomplish this with a carefully implemented strategy of balance.

Germany Before 1914

In 1871, a united Germany emerged on the world stage as a great power following the spectacular defeat of France in the Franco-Prussian War.[1] Before 1871, the Germanic peoples were divided among dozens of minor kingdoms, duchies, principalities, and free cities, as well as the two major German states, Austria and Prussia—which were in competition for leadership of this widespread hodgepodge of political entities. In this contest, Prussia had steadily risen in power over the course of the eighteenth and nineteenth centuries, gaining great influence among these disparate and mostly poor German states, while Austria's influence had slowly declined. Nonetheless, these powerful German states were competing to unite the weaker ethnic German kingdoms under a single banner of German-speaking leadership.[2]

The competition came to a head in 1866 when Austria and Prussia fought a short war for hegemony over the lesser German states. Prussia shocked Austria with a rapid and decisive victory at Königgrätz on 3 July 1866. The Austrian Empire assumed a subordinate position to Prussia thereafter.[3] Prussia then established a loose confederation of German states that stopped short of full political unification. However, enough control of foreign policy and military affairs was ceded to Prussia that it could dictate actions to its neighbors.[4]

In 1870, long-running friction between the French and Prussians spilled over into war. Prussian Chancellor Otto von Bismarck conjured up a crisis that would require Prussia to act to save its honor. With commitments of forces from the confederation and its own large army, Prussia fielded a combined army that overwhelmed France. At the conclusion of hostilities in 1871, Bismarck took the opportunity to proclaim a united German Empire under the leadership of the Prussian king, now emperor, Wilhelm I. In an 1871 ceremony at Versailles' Hall of Mirrors in Paris, the new state asserted its dominance. Subsequently, the new balance among the great powers in Europe tilted heavily toward imperial Germany.[5] In just a few years, a new nation forged from a patchwork of disunited, weak kingdoms and duchies had become the strongest power on the European continent. As such, Germany commanded respect, and fostered fear, among its neighbors.

France, Britain, and Russia, perceiving a mutual threat from the new German Empire, formed what became known as the *Triple Entente* in 1907 to counter Germany's rapid rise. They considered their alliance an insurance policy against future German expansion, through commitments to support one another with military forces in the event of a conflict.

German leaders, on the other hand, naturally viewed this alliance as an attempt to stunt Germany's rise. As a result, German leaders—most notably Kaiser Wilhelm II, who succeeded Wilhelm I in 1888—came to believe their neighbors were attempting to encircle Germany. In Wilhelm's case, some historians believe his mental state bordered on paranoia. In his engagements with other European leaders, Wilhelm and his ministers routinely stated that Germany required "a place in the sun" and adequate living space.[6] His thought processes are considered a major reason for the outbreak of World War I, in which Germany attacked first to prevent encirclement.

China since World War II

The modern incarnation of China as a nation is in some ways parallel to the rise of Germany. In the late twentieth century, China began to rise from a long period of colonial subjugation. In 1949, the Chinese communists defeated the nationalists after an extended and unforgiving civil war. This was the culmination of the struggle to throw off a colonial yoke placed on the Chinese people, first by several European powers, and later by Japan. Between 1945 and 1949, elements with competing Chinese political ideologies battled each other for hegemony over China. The communists, who emerged victorious, quickly established a harsh system of centrally controlled governance that doomed China to a period of stunted development and political suppression.

However, in the 1970s, a new generation of leaders began to steer China in a different direction following the death of Mao Zedong. The new leaders sought to bring greater prosperity and economic growth to China through state-managed capitalism. Communism was not abandoned, but many of its economic mechanisms were liberalized and modified to enable growth, albeit still centrally overseen by the party. This led to China's rise from stagnation and poverty to an unprecedented level of economic prosperity and enhanced political influence in the world. By the 1990s, yearly double-digit economic growth was pulling China toward a place among the top tier of nations. With its staggering growth came China's demand for greater respect.[7]

Similar to the concerned views of neighboring nations toward Germany in pre-World War I Europe, by the late 1990s China's neighbors began to fear it would encroach on their sovereignty. Chinese actions such as missile tests off the coast of Taiwan in 1996 and claims on the Spratly Islands that originated around the same time have fueled such fears.[8] Therefore, some states have taken steps to protect their interests. For example, after a decades-long period of cool relations between them, India and the United States are cultivating a strong relationship that includes both economic and security agreements. According to Ted Galen Carpenter, initiatives such as these cause Chinese leaders to believe the United States is leading "a containment strategy directed against China."[9]

In response, China is countering the perceived containment through a rapprochement with Russia. Since 2013, China and Russia have been cooperating for mutual benefit. For example, in 2013, they signed a $270 billion agreement to double the amount of Russian oil delivered to China. In 2015, Russia and China signed a deal in which Russia would build a pipeline to facilitate the delivery of natural gas from Siberia.[10]

China and Russia have a long history of antagonism, as do Russia and the United States. Yet, if China and Russia are now working together, why? For Russia, an economic agreement with China offers a way to stave off the effects of stifling economic sanctions imposed by the West because of Russia's heavy-handed actions in Ukraine. However, in China's case, overlooking the previous adversarial relationship with Russia appears to offer a way to counterbalance the United States, and thus provide protection against containment.[11] A historical parallel can be found in Germany's attempting to counter the Triple Entente with the Triple Alliance of Italy, Austria-Hungary, and Germany (as well as with an alliance with the Ottoman Empire).

In fact, the parallels between the nineteenth-century rise of Germany and the modern rise of China are quite intriguing. Much as Germany had emerged as a great power from a sprawling backwater, China rose in the twentieth century. Further, the claims and statements uttered by their leaders are similar. For example, during a 2010 meeting of the Association of Southeast Asian Nations, according to Washington Post writer John Pomfret, some attendees claimed to hear the Chinese foreign minister say, "China is a big country and other countries are small."[12] If that statement reflects prevailing attitudes, China's demand for respect combined with claims for regional hegemony—that some have dubbed a Chinese Monroe Doctrine—have the ring of an earlier time.[13]

One consequence of China's power is that nations bordering it, such as the Philippines, Vietnam, South Korea, and Japan, have developed closer ties among themselves. Additionally, Chinese encroachment of international waterways has drawn the United States closer to these countries as well.

Although there are currently no formal alliances or reassurance treaties in effect, the sum of the tighter relations between the United States and China's regional neighbors is leading some Chinese scholars and leaders to believe there is a concerted effort to

(Photo courtesy of Wikipedia)

Concerned that the great powers of Europe were scheming to encircle Germany to limit its power and influence on the continent, Kaiser Wilhelm II, emperor of Germany and king of Prussia, met 8 December 1912 with top German military advisors to discuss courses of action including possibly declaring war. The meeting became known as "the War Council."

contain China. In fact, as author Biwu Zhang notes, there is even the claim by certain Chinese scholars that the United States is stoking disputes between China and its neighbors as a way to increase China's difficulties.[14] This again echoes an earlier time, when the imperial German leaders came to believe the Entente was encircling them and that it was necessary to act. Misjudging German perceptions, the Entente's soldiers, politicians, and diplomats failed to prevent the cataclysm of World War I in the face of a rising Germany. Will leaders act in a different way to avert a clash with a rising China in this century?

A Policy Proposal for Better Relations with China

The patterns of history perhaps can help us devise ways to avoid repeated pitfalls. Chinese leaders fear containment because they do not want China to lose influence, to stagnate, or somehow to become subjugated to the desires and interests of other nations, as before 1949. Such a future is unthinkable and intolerable to the Chinese.[15] Therefore, how can the United States and other nations in the Asia-Pacific region change this perception among Chinese leaders?

Ashley J. Tellis of the Carnegie Endowment for International Peace has penned an excellent study with solid recommendations that could avoid promoting among Chinese leaders the perception that the United States is attempting to implement a containment policy. His approach advises promoting balance and cooperation versus containment. His main recommendations for U.S. policymakers to achieve such balance are to bolster regional actors, selectively deepen globalization, bolster U.S. military capabilities, and reinvigorate the U.S. economy.[16] Effective implementation of Tellis's overarching policy of balance and broad growth should be supported by four critical elements: transparency, engagement, inclusion, and agreement.[17]

For centuries, a balance of power among the world's great powers, arrayed in blocs, was facilitated by political leaders for the purpose of maintaining peace. It was only after World War II that the United States implemented a policy of containment to counter the expansion of the Soviet Union.

Containment worked in that case, but it cannot work in reference to China. First, the Chinese and U.S. economies are inextricably interconnected. By contrast, during the Cold War, the U.S. and Soviet economies were almost completely separated as trading partners in competing ideological blocs. Second, China's geopolitical location makes containment extremely problematic because of its centrality in the Pacific Rim. In addition, Soviet expansion ambitions were worldwide, whereas China does not necessarily desire expansion, even on a regional level. In reality, what China most likely wants is regional hegemony and recognition as the first nation in the Pacific. Therefore, containing China would accomplish little since its ambitions are limited to its own region.[18] Thus, balancing makes more sense than

containing, but how could it work?

Balancing is not about building a bloc of nations in Asia to counter China from a military or economic perspective. Rather, as Tellis points out, creating balance in Asia "would focus mainly on restricting Beijing's capacity to misuse its growing national capabilities in ways that undermine American power."[19] Instead of forming competing camps, balance would push China toward conforming to international norms.

(Photo by Mass Communications Spc. 1st Class Nardel Gervacio, U.S. Navy)

Senior Capt. Wang Jianxum, deputy chief of staff of East Sea Fleet, People's Liberation Army (Navy), and commander, Escort Task Group, Chinese Navy Ship *Jinan*, gives a tour of the ship's bridge to Rear Adm. John Fuller, commander, Navy Region Hawaii and Naval Surface Group Middle Pacific, 13 December 2015 during a routine port visit to Hawaii.

To implement a balancing strategy, the United States must "buttress its Asian partners, redress the losses … [the United States has] suffered because of China's participation in global trade, reinvest in sustaining the military superiority necessary for effective U.S. power projection worldwide, and revitalize its national economy."[20]

In sum, balance is about rebuilding American strength while working closely with friends in the region, building them up, and settling the fears they have that could cause unnecessary confrontations. Thus, the United States should be seen as redirecting its energy to solidify its own economy and strengthen friends rather than seeming to seek containment of China.

To make such a strategy of balance work, the United States first must conduct its efforts with 100 percent transparency.[21] Transparency helps build trust, and building trust is the only way to break down the suspicions held by the Chinese. Therefore, the United States should make a crystal clear statement of its policy of balance, and its support for broad growth for all nations in the Pacific Rim "to realize their strategic potential and increase their mutual cooperation" for the benefit of all.[22] The policy should integrate all instruments of national power, with a balance between diplomatic, informational, military, and economic instruments.

Second, Tellis states, "the United States (and its friends) ought to engage China at multiple levels, both bilaterally and multilaterally," including industrial, social, military, and educational exchanges.[23] In his analysis of Chinese perceptions, Zhang found a train of thought among some Chinese scholars that could translate to support for the approach put forward by Tellis. This suggests there could be opportunity to conduct meaningful engagement with the Chinese without stoking fears of encirclement.[24]

However, the United States needs to avoid conducting engagements that add up to inconsistency in overall policy. Inconsistency gives the appearance of weakness and a lack of integrity. Moreover, the military should not appear to be leading the policy

initiatives, while diplomatic, informational, and economic concerns trail at a distance. This can lead to misinterpretation and mistrust, with Chinese leaders railing against efforts intended to build relations and improve cooperation and partnership. Thus, engagement must have a clear message, evenly communicated across all elements of national power, with the military in support.

Third, the United States has to include China in all international decisions and in development of world protocols and policy.[25] China cannot be allowed to act as a bystander on the world stage.

At present, China tends to use its policy of nonintervention in other nations' domestic affairs to avoid participating in efforts to maintain global stability. China sometimes stands on the sideline in world crises, criticizing others who attempt to bring order out of chaos. However, China can no longer reserve the right to complain while not putting a shoulder to the wheel if it is to gain the respect it desires. If China wants respect, it should be called out to become more engaged in the world community. It should be encouraged to partner with other nations to prevent or stabilize crises for the betterment of all.[26] Tellis points out in his study that the United States must persuade China to accept this.

Finally, in spite of the myriad areas of disagreement, Tellis identifies efforts in which China, its neighbors, and the United States can work together. Among them is cooperation in deepening trade links and combating terrorism.

All nations in the Asia-Pacific region benefit immensely from trade with one another. Expanding trade among nations can bring rewards for all participants.[27] Additionally, China, the United States, and their partners collectively remain vulnerable to terror groups. The United States has learned many lessons over the past decade that could assist China, which has a significant threat from radical Islam in its northwest provinces. The two countries and others in the region could partner to attack this common problem. Such cooperation could help break down barriers, build trust and rapport, and prevent China from misinterpreting the intent of other nations.

Conclusion

History is not a template that can be used to predict specific future events or outcomes. However, a review of the past can reveal patterns from which to consider today's challenges. A cursory review of events demonstrates eerie similarities between imperial Germany of a century ago and China today. A sense of encirclement paranoia influenced the behavior of German leaders, leading to missteps that plunged the world into a devastating war. Based on my personal observation and a survey of published sources, China could be developing a similar delusion that the United States is leading an effort to contain it. The danger is that such a situation could lead to miscalculation and overreaction—unnecessary conflict.

Conflict is preventable if the United States uses all the instruments of national power to achieve a balance of power in which China is not constricted. A policy of balance should build up the U.S. economy as well as its partners, maintain U.S. military power, and take the focus off China. Inherent to the success of such a policy is reducing the sense among Chinese leaders that the United States is trying to contain it. The United States can accomplish this by communicating clearly its desire for mutual benefit.

Cultivating a partner in China—in conjunction with friends in the region—rather than an adversary may avert a collision that would prove devastating to all. ■

Biography

Col. Michael J. Forsyth, U.S. Army, is the chief of staff of the Alaskan NORAD (North American Aerospace Defense Command) Region and Alaskan Command at Joint Base Elmendorf-Richardson, Alaska. He holds an MS in strategic studies from the U.S. Army War College and master's degrees from the U.S. Army School of Advanced Military Studies and Louisiana State University. He previously commanded the 196th Infantry Brigade at Fort Shafter, Hawaii. Forsyth served four combat tours, one during Operation Desert Storm and three tours in Afghanistan. He is the author of three books about Civil War campaigns.

Notes

1. Christopher Clark, *Iron Kingdom: The Rise and Downfall of Prussia, 1600-1947* (Cambridge, MA: Harvard University Press, 2006), 510.
2. Ibid., 531–33.
3. Ibid., 542 and 545–46.
4. Michael Sturmer, *The German Empire, 1870-1918* (New York: The Modern Library, 2000), 15–24.
5. Sturmer, *The German Empire*, 3–5; and Gordon Craig, *Germany, 1866-1945* (New York: Oxford University Press, 1978), 33–34.
6. Sturmer, *The German Empire*, xxi, 84–85, and 88–90; and Clark, *Iron Kingdom*, 553–55.
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14. Biwu Zhang, "Chinese Perceptions of US Return to Southeast Asia and the Prospect of China's Peaceful Rise," *Journal of Contemporary China* 24(91) (2015): 185–87 and 189. doi:10.1080/10670564.2014.918419. The author of this study notes that he analyzed eighty-three articles and papers from a variety of scholarly Chinese journals. Of this sample, seventy-five articles took a negative view of U.S. actions involving China. Thirty-five of those took a position that U.S. efforts weakened China's influence in Southeast Asia or worsened its security situation, suggesting a prevailing perception that U.S. policy is aimed at undermining China.
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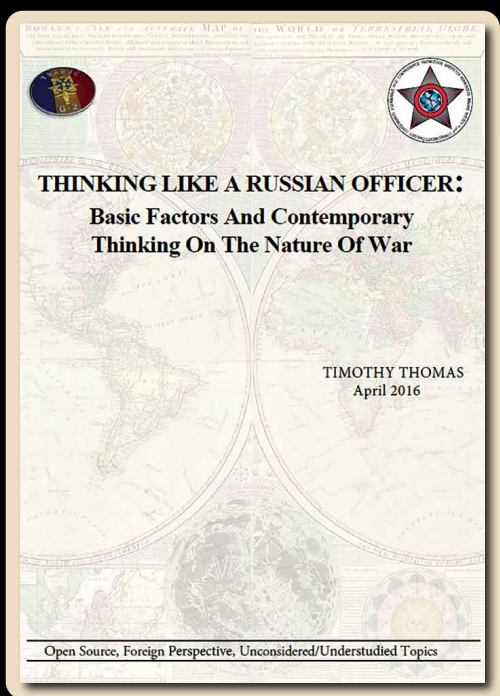

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The first part of this two-part monograph provides a detailed analysis of the evolution of Russian military thinking with regard to modern warfare, with insight into the decision processes that culminated in annexation of Georgian territory as well as the Crimea from Ukraine. The second part discusses the views of various Russian military authors who have written on various components of the emerging nature of war. This monograph provides a succinct primer for those wishing to catch up on the most current Russian views of military force as they relate to other elements of national power and is especially valuable for understanding the Russian perspective on events as they continue to unfold in Ukraine, Eastern Europe, and Syria.

http://fmso.leavenworth.army.mil/documents/Thinking%20Like%20A%20Russian%20Officer_monograph_Thomas%20(final).pdf

Foreign Language and History

The Enlightened Study of War

Col. John C. McKay, U.S. Marine Corps, Retired

The greatest leaders must be educated broadly.
—Maj. Gen. George H. Olmsted, U.S. Army

Thirty-eight years ago, as a combat-seasoned captain of infantry, and a recent Olmsted scholar fluent in Spanish, I was counseled by a revered senior officer distinguished for valor and highly esteemed. I had served under him in war and would again serve under his command in peacetime. He was a consummate professional and a gentleman of the first order. The officer bluntly informed me that my ongoing pursuit of a master's degree at Georgetown University in Washington, D.C., undertaken on my own time while carrying out demanding duties at Headquarters, U.S. Marine Corps, was a waste of time. In the 1970s, the Marine Corps did not permit returning Olmsted Scholars to pursue a master's degree while on duty. Funding for my studies, regardless, was borne by the Olmsted Foundation and GI Bill education benefits.

In the 1970s, U.S. military culture tended to devalue graduate study. Today, advanced, refined education cannot be treated as a nice-to-have frill for the officer corps. For all of recorded history, the Four Horsemen of the Apocalypse—war, death, pestilence, and famine—have ridden stirrup to stirrup as causes of human misery and political change. Of the four, war still rides a glossy steed, foddered by many of the advances that have weakened its companions. The war-horse remains a charger that casts a long shadow. The design of its bit and bridle should become one of the principal, if not the principal, preoccupations of political leaders, military officers, and learned thinkers. That preoccupation should take the form of advanced study.

The study of the causes of war, in contrast to its course or its conduct, is a modern phenomenon that dates no earlier than from the Age of Enlightenment. The attention the officer corps has now grown accustomed to paying the subject is more recent still—coterminous not only with a sense of horror of the military failures of the past century but also with an interest in political and social sciences.

One author states that studying war is somewhat similar to studying economics.[1] Western scholars have made some progress in mastering the intricacies of economics, but not so much the study of war and preserving peace. In fact, in the United States, it was not until the dawn of the nuclear age that the study of war and peace commanded anywhere near the degree of intellectual attention that had been devoted to economic analysis. Suffice it to say the incidence of war today, the state of play in the actual study of war, the rising Far Eastern powers, and the actions of Russia suggest focusing intellectual attention toward the study of war. Moreover, it behooves the military services to engender and to ensure an enlightened study of war. That study is accomplished only through advanced education that includes languages and history, in order to come to grips with the dynamics of human social behavior.

The Field of Strategic Studies as a Human Endeavor

The field of strategic studies, that is, the analysis of force in international relations, has not found its own John Maynard Keynes. Can we isolate strategic studies, as economists isolate topics of study with varying success, from the problems of human organization and international politics?[2] Perhaps not.

(Photo by Sr. Airman Patrick J. Dixon, U.S. Air Force)

Iraqi Maj. Gen. Othman Ali Farhoud (left), commander, 8th Iraqi Army Division, shakes hands with U.S. Army Gen. John Abizaid 27 October 2005, Camp Echo, Iraq. Abizaid, an Olmsted Scholar who studied at the University of Jordan, Amman, is a fluent Arabic speaker and an advocate of cultural and language training. "So much of the problem that we are facing in the Middle East is a cultural gap that can be closed by earlier education in an officer's career," Abizaid said in an Armed Forces Press Service interview 26 May 2007.

First, war is a product of the clash of ideas and beliefs. Ideas are not to be grappled with, much less understood, unless the cultures from which they emanate are understood. A culture cannot be understood other than through an in-depth knowledge of its language.

Second, history must be the handmaiden of those who would be policy shapers. Those who ignore or eschew the importance of ideas and beliefs as propellants of human action are on a fool's errand. Moreover, to comprehend and understand human cultures requires grounding in such diverse disciplines as anthropology, sociology, social sciences, brain science, psychology, and much else. The tragic consequences of ignoring these disciplines are readily found in the United States' misadventures in Vietnam in the 1960s, Lebanon in the 1980s, and now the Middle East.[3]

The costs of failure endure for decades, if not longer. The ignominy of Vietnam lingers still. El Salvador and Honduras have deteriorated socially and economically into a state of near lawlessness after failed U.S. interventions.[4]

Nor can ignorance be nullified by arrogance. The legendary Gertrude Bell, a British colonial official who a century ago made herself indispensable in a man's world, correctly remarked of the British mandate over what was to become Iraq, "can you persuade people

to take your side when you are not sure in the end whether you'll be there to take theirs?"[5] Those were prescient words. While Kaiser Wilhelm II was planning the Berlin-to-Baghdad railway, Bell was making herself intimately familiar with a great swath of Arabia, from remotest Syria to the waters of the Persian Gulf. Fluent in Persian and Arabic—as well as German and French—she had an uncanny knowledge of regional history. She was also the first female to receive a first class honors in history from Oxford University. Owing to conventions of the time, women were not allowed to matriculate or graduate from university before 1920. Failing to groom the best people a nation has to offer, regardless of gender, was shortsighted and ultimately inimical to the national interest.

(Photo courtesy of International Military Forums)

U.S. Marine Corps Gen. James L. Jones, supreme allied commander, Europe, speaks with Belgian NATO Reaction Force soldiers during Exercise Steadfast Jaguar 22 February 2006 in Sao Vicente, Cape Verde. Jones speaks fluent French thanks to a childhood spent mainly in Paris where his father worked for International Harvester. Additionally, he honed his foreign engagement skills by earning a degree from Georgetown University's School of Foreign Service.

For these reasons and a myriad more, the United States must require the officer corps to be denizens of the bastions of advanced learning wherein that multiplicity of vagaries and propensities of what is called humankind can be studied and analyzed. Only thus can the armed forces of the Nation effectively execute their primary function within society. To neglect this obligation would be anachronistic. Moreover, it would be a dangerous gamble with the future.

The Great Diversity of Intellectual Qualities

Professional military education can be viewed in two general facets. The first is the inculcation and shaping of new officers into an integral part of the larger whole. A new officer is impressionably accepting, malleable even, of the mores and ethos of the profession of arms. The second generally occurs at mid-field-grade ranks such as lieutenant colonel or junior colonel, and increasingly with flag officers, wherein the services' war colleges (and generally for flag officers, civilian universities) allow for an intellectual maturation of the officer. In the words of Carl von Clausewitz, "The influence of the great diversity of intellectual qualities is felt chiefly in the higher ranks, and increases as one goes up the ladder. It is the primary cause for the diversity of roads to the goal … and for the disproportionate part assigned to the play of probability and chance in determining the course of events."[6]

The challenges facing military officers are prodigious and consequential. Technology, with all that it portends, is just one area of interest. Americans are the consummate experts on focusing on technology to win wars. Research into electromagnetic pulse warfare, information dominance, advanced information technology systems (susceptible to inexpensive hacking), and increasingly expensive hardware are but a few examples. In general, Americans are good at technology. It is good U.S. forces continue to enhance expertise in those areas where they have a comparative advantage.

Recall, as well, that if destructive technology amplifies violence, constructive technology amplifies compassion, and the lessons of technology are universal. One of those lessons is that technological teleology is not an accurate yardstick of actual product performance. Is it not ironic, however, that the study and learning, and yes, the entrepreneurial spirit, that have brought forth all these wonders might not have been directed a bit more on the software? Specifically,

U.S. policymakers, and perhaps military leaders, have given short shrift to the ideas, beliefs, motivations, and dreams of human beings.

The discipline given the shortest shrift is the learning, truly learning, of a foreign language. Arguably, foreign languages are viewed as just another adjunct in the fixer's toolbox. That language proficiency takes time to inculcate and constant attention to maintain is not readily recognized. As good as Americans are at technology and its myriad offshoots, they are dejectedly abysmal in fostering anything approaching an appreciation for, or recognition of, the need for individuals to learn a foreign language. Spillover of this attitude into the military realm is natural. For years, the military has deluded itself, particularly when dealing within the Western Hemisphere, with the illusion that given the number of Hispanics, particularly among its enlisted personnel, there exists little need for a formalized approach to ensuring Spanish language proficiency.

The officer ranks suffer a disproportionately small number of individuals who can claim foreign language fluency. Often as not, fluency in another tongue has not been acquired through any formal education or dedicated immersion into a foreign culture. In addition, the fact that an individual is, say, from Puerto Rico, and is fluent in Spanish, does not mean she or he will work well with indigenous tribes in the jungles of Peru. Americans typically consider Peru a Spanish-speaking country, but what if those indigenous peoples speak only Quechua or Aymara?

The dearth of linguistic and cultural knowledge—not to mention historical acumen—was a contributing factor of no small consequence in the morass of Vietnam, the tragedy of Beirut in 1983, the failure of Mogadishu in 1993, and the current serious confrontation with Islamic fundamentalism.[7] Would military leaders having a firm grasp of language and an in-depth appreciation of regional history have avoided these conflicts? Could U.S. military failures have been averted if the military had made the necessary concerted adjustments to the education of the officer corps, so that officers understood human factors? Perhaps not, but these two faculties, properly employed and applied, would have pragmatically enhanced decision making. The nature of the interventions, and possibly their outcomes, might not have been so tragic.

Therefore, might we not be subjectively committing the nation to living a lie when we trundle off on some quixotic foreign errand? In any case, the point is that within a Clausewitzian context, the United States has failed significantly in inculcating the "influence of the great diversity of intellectual qualities" within the officer corps of the armed forces.

The Study of Languages

The George and Carol Olmsted Foundation, known as the Olmsted Foundation, offers scholarships to active duty junior officers recommended by the Army, Marine Corps, Navy, and Air Force. They must have completed at least three years of commissioned service, but not more than eleven years of total active military service at time of selection. Each year, selected officers receive the unparalleled opportunity to study in a foreign language at a foreign university. The nature of the program is particularly suited for the military challenges today's officers will face. Further, officers have the opportunity to study languages and cultures in depth relatively early in their careers.

How the services view the Olmsted program is somewhat inconsistent, if not assumptive. None treats the Olmsted program as a separate and distinct entity. For example, the Marine Corps offers the program within a Marine Corps order that also announces Burke Equivalent Scholars, Fulbright, Rhodes, and Guggenheim Scholarships. Given the Olmsted Foundation's vision and success, the services ought to consider the program as a separate entity when soliciting candidates. If properly utilized, the Olmsted program permits an essential introduction to foreign language and culture that can be expanded on throughout an officer's career. Nineteen Olmsted scholars were selected in March 2016 for the fifty-seventh Olmsted Scholar Class. To date, 620 scholars have completed or are completing studies, or are preparing for two years of study abroad. Scholars have studied in forty languages in over two hundred foreign universities spanning sixty countries worldwide.[8]

The Study of History

History fares little better than foreign language in terms of how the services prepare officers. The serious study of history languishes in the supposed dusty and sterile realms of academe. It is something pursued at one's whim rather than, in the words of Sir Winston Churchill, "to come to the root of the matter" for

one's own understanding.[9] One could do worse than ponder Rudyard Kipling's admiring verses about the tribal warriors who attacked British infantry forces during the 1898–1899 Sudan campaign. The munitions used by professional British soldiers against indigenous irregulars included Martini-Henry rifles—an advanced technology of the era. Nonetheless, the vigorous attack embarrassed the British by breaking their infantry formation, known as a square:

> We sloshed you with Martinis, an' it wasn't 'ardly fair; / But for all the odds agin' you, ... you broke the [British] square.[10]

This raises another consideration: what of the enemy who does not play fair, or perhaps who devises a new set of rules of play? Americans sometimes forget how a small group of revolutionary fighters held off two waves of British forces at Bunker Hill on 17 June 1775.[11] The British commanders entered the battle confident of their superiority, and the cost of their victory over amateur militias was over one thousand casualties, including many officers.

What assumptions do U.S. commanders make about their enemies? Perhaps Americans imagine their superiority over enemies rests in technological dominance—which is transitory. Might I suggest that Americans, too, have been caught up in hubris engendered through supposed superiority of the professional military, like the British at Sudan or Bunker Hill? The American square has been broken more than once since the end of World War II.

Linguistic knowledge and proficiency coupled with deep historical acumen foster strategic consistency. They help bestow a certain universal understanding of human grievances, motivations, and probable actions. Lay aside for the moment professional military education, important though it is, including the war colleges. Consider programs such the Olmsted Foundation, offered to company grade officers. Think in broader terms, like Stanford University, Johns Hopkins University, the Naval Postgraduate School, Georgetown University, and others that prepare officers for the challenges the Nation faces today and the unknowns of tomorrow.

(Photo by Paolo Bovo)

Army Brig. Gen. Christopher Cavoli, commanding general of the 7th Army Joint Multinational Training Command, speaks with Mariagrazia Santoro, Region Friuli Venezia Giulia, during the Sustainable Training Area Management Conference in Udine, Italy, 9 June 2015. Cavoli speaks fluent Italian, Russian, and French, and holds degrees from Princeton University and Yale University.

Inadequate study has impaired military operations in years past. As Lord of the Admiralty Winston Churchill noted of the Royal Navy on the eve of World War I,

> [It] was not mute because it was absorbed in thought and study, but because it was weighed down by its daily routine and by its ever-complicating and diversifying technique. We had competent administrators, brilliant experts of every description, unequalled navigators, good disciplinarians, fine sea-officers, brave and devoted hearts: but at the outset of the conflict we had more captains of ships than captains of war.[12]

Apropos these words, a 2015 study describing U.S. Navy deficiencies, *Navy Strategy Development: Strategy in the 21st Century,* echoes Churchill's concerns of over a century ago. The study asserts that the Navy "places little institutional emphasis on educational and intellectual development of its officer corps beyond operational matters."[13]

The Understanding of Human Nature

Our captains of war need to be absorbed in thought and study that can only come through advanced education. The mastery of languages should come from acculturated immersion. Rosetta Stone and even the Defense Language Institute Foreign Language Center may be good for what they purport, but they are entry level, introductory. Likewise, there is a need to truly understand history, or otherwise military leaders will stumble about blindly.

Foremost, our captains of war must strive to understand human nature. Advanced education of the officer corps is not a mere luxury but rather an absolute. Anything short of taking this on board is foolish and perilous. ■

This article is adapted from a speech given 24 July 2015 for the Naval Postgraduate School Marine Dining Out, at the Pacific House, Monterey, California.

Biography

Col. John McKay, U.S. Marine Corps, retired, is a writer, consultant, and speaker. He is a twice-wounded infantry officer having served in three wars. He holds master's degrees from Georgetown University and the National War College. Reared in Latin America, he is an Olmsted Scholar and a Spanish linguist. He served as naval attaché to El Salvador during the civil war in the 1980s, and in 1995-96 as commanding officer of Joint Task Force-160, Guantánamo Bay, Cuba. He has worked in South America for a national intelligence agency and in Mexico for the Drug Enforcement Administration.

Notes

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Tactical Utility of Tailored Systems

Robert E. Smith, PhD

We have to avoid million-dollar solutions to hundred dollar problems. That doesn't put us at any advantage. That puts us at an economic disadvantage at the strategic level.

—Gen. David G. Perkins,
TRADOC commanding general

The Army has traditionally been equipped to confront what is expected, but winning in today's complex world requires being prepared to fight an unknown enemy. Future enemies will have access to off-the-shelf technologies that previously only large nation-states could afford. Meanwhile, large nation-states are able to duplicate or steal U.S. high-technology investments at a fraction of the research cost. For example, China rapidly duplicates Defense Advanced Research Projects Agency (DARPA) and other U.S. innovations, often improving on designs. One can find evidence of such activities in replicas of the Big Dog robot and the Switchblade tube-launched drones.[1] No longer can the U.S. spend billions to develop the next stealth technology and expect a twenty-year payoff; the return on investment is likely not there.

This article explores the idea of combining virtual environments and rapid manufacturing to create tailored materiel specific to a region or even a battle. The Army needs a powerful innovation process to tilt the cost-effectiveness calculation back in the favor of the United States and drastically increase the rate of materiel innovation.

In the 1970s, the United States chose to offset the Union of Soviet Socialist Republic's superior numbers using technological differentiation (developing weapons with superior capabilities). This led to the development of the Abrams tank and Bradley fighting vehicle (along with precision munitions and stealth technology). However, while the world changed over the years, those vehicles were still expected to perform interchangeably anywhere they were required.

Notwithstanding the changed world, equipment still must provide maximum capabilities for the warfighters. However, the multiplicity of missions that have emerged has led to the development of over-specified *exquisite* systems that require extraordinary (and expensive) technology leaps. The recently canceled Ground Combat Vehicle (GCV) Program provides an excellent example of an exquisite system. GCV requirements included a three-man crew, nine dismounts, and high protection and lethality levels—all bundled into an individual platform. The result was a tactically repulsive 75- to 85-ton vehicle that would have required exotic technology leaps to become useful.

In contrast to exquisite systems, tailored systems focus on specific functions, specific geographic areas, or even specific fights. The narrow focus allows achievement of high performance without the needless development of exotic and expensive technologies that aim to satisfy too many requirements.

The wide range of potential operating environments the Army may encounter requires vehicles with correspondingly different capabilities. For example, a vehicle solution for a megacity may require a small size, much like those driven by the local population. On the other hand, a swamp- or amphibious-entry vehicle may need a screw propulsion system, and a desert environment may require yet a different type of solution. Modularity of components may be possible across these platforms, but the hull structure would likely have to be custom made.

Since the U.S. Army is increasingly becoming a CONUS-based expeditionary force, wherever we

(Photo courtesy of Textron AirLand, LLC)

A Textron AirLand Armored Scorpion ISR-Strike aircraft flies in November 2014. Conceived as a close air support (CAS) aircraft for a low-threat air defense environment, the Scorpion was built from off-the-shelf components in twenty-three months, from concept to first flight, for about $20 million. Its operating cost is about $3,000, compared to about $18,000 for an F-16 performing the same CAS mission.

deploy, the regional actors will already have home-field advantage, including equipment attuned to the operating environment. For example, the South Korean K1 tank is similar to the U.S. M1 tank except that it has a hydropneumatic suspension, which increases the available gun elevation and depression angles. The increased angles provide a greater vertical firing range, an important advantage in Korea's dense urban areas and surrounding mountainous terrain. The United States needs such tailored materiel to attain an affordable capability overmatch of enemy systems by default.

In place of the current one-size-fits-all acquisition approach, since platforms fight in formations, the tip of the future spear (see figure 1, page 110) could be inexpensively "sharpened" by fielding a small quantity of highly tailored systems that perform a limited mission set extremely well. It is also possible that small quantities of regionally tailored equipment could be designed and fielded.

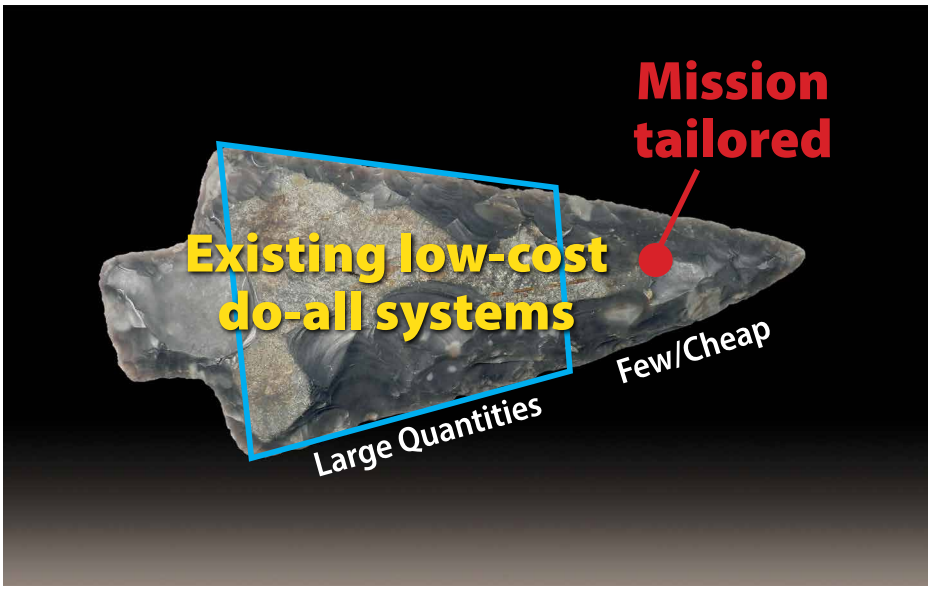
Such a process, capable of rapidly producing tailored and adaptable solutions, would be hard for our enemies to duplicate since it requires a large organization and capital investment. It would create an asymmetric advantage for our forces that most of our adversaries would not be able to counter easily.

Ideally, rapid manufacturing could create a procurement system that produces custom materiel at a cost low enough to make equipment disposable. Further cost savings might be realized by upgrading existing Army assets such as high mobility multipurpose wheeled vehicles (HMMWV) operating at protection levels unsuitable for manned missions with autonomy kits that enable the platform to function robotically without a human operator in the vehicle. Such newly autonomous systems could perform both mundane and dangerous missions.

A further advantage of tailored systems is that they will force the enemy to deal with a variety of unknown U.S. assets, perhaps seen for the first time. Since

protection and lethality will be unknown to the enemy, it will be asymmetrically challenging for them to develop in a timely fashion tactics, techniques, and procedures, or materiel, to effectively counter such new capabilities.

For over a decade, the Army has touted modularity as a panacea to achieve system tailoring and flexibility. However, experience has shown that any time something is modularized, it adds some sort of interface burden or complexity. In contrast, a specific-built system will always outperform a modular system for this reason. The disadvantage to a specific-built system is it lacks an inherent adaptive capacity and means for dealing with unknowns. An optimal solution will likely be a combination of modularity and tailoring.



(Graphic by Robert E. Smith, PhD)

Figure 1. How Mission or Regionally Tailored Systems Outperform "Do-all" Exquisite Systems at Lower Cost

Real-World Tailored System Examples

Excellent historic examples of tailored systems were those developed for the amphibious assault phase of the Normandy D-Day invasion during World War II.[2] The failed Allied raid at Dieppe in August 1942 showed how difficult it was to land vehicles and men during an amphibious invasion.[3] One key lesson learned from Dieppe was that specialized armor was needed to get across soft sand and through beach obstacles. British Maj. Gen. Sir Percy Cleghorn Stanley Hobart was responsible for the development of specialized armored fighting vehicles ("Hobart's Funnies") to counter those obstacles. Applying lessons learned from the Dieppe experience, he developed equipment and tactics that not only improved on existing designs, but also created entirely new technologies. These unusual vehicles were key enablers that allowed the Allied forces to break through German coastal defenses to effect a successful landing.

A more recent example is the Scorpion light attack jet.[4] Textron AirLand unveiled the Scorpion at the 2013 Air Force Association's Air & Space Conference. The Scorpion cost about $20 million each. It was built from off-the-shelf components and went from concept to first flight in twenty-three months. Compare this to the exquisite F-35 Lightning, which hit the drawing board in the early 1990s and cost about $157 million per copy. Granted, the Scorpion and F-35 are not an apples-to-apples comparison, but comparison of the two still bounds the problem.

Bill Anderson, president of Textron AirLand, offered a closer comparison by pointing out that the United States is currently using its F-16 superjet on low-end missions in Afghanistan.[5] "There's no air-to-air threat there. They are spending $18,000 an hour running the F-16. You're burning the life of the aircraft on missions it was not designed for," said Anderson.[6] In contrast, Textron is targeting a Scorpion's operating cost at $3,000 per hour.

Enablers

Though tailoring systems offers many advantages, new challenges are created when there is a hugely varied fleet of tailored systems, especially for logistics, training, and maintenance. Capt. Eric Elsmo provides an example of deploying a tailored, modular system:

> A tank, or any other form of modular equipment that is not part of the first wave of combat force, would not necessarily be standard

equipment for a deploying unit. In the Army After Next, modular equipment could be created specifically for the contingency and be assembled during transit. The chassis may come from one location, while the turret may be sent from another, with the two marrying up in the theater of operations. The new piece of armor then would be employed during the logistics pulse or refit phase of the operation.[7]

(Photo by Sgt. J. Mapham, War Office official photographer, Imperial War Museum [H 37859])

Churchill Armoured Vehicle Royal Engineers (AVRE) Type C mark II "Bobbin" carpetlayer tests laying tracks for armored vehicles to follow across soft beaches in preparation for the Normandy "D-Day" landings that would take place 6 June 1944. This vehicle was one of several tailored solutions to ensure invading armor did not get mired in sand that were developed under the personal direction of British Maj. Gen. Sir Percy Cleghorn Stanley Hobart.

Maintenance and replacement parts. Regarding maintenance, one key is to develop a well-tracked digital manufacturing database of replacement parts. With the advent of 3-D printing and digital manufacturing, a new part may be procured as easily as scanning a bar code and pressing print. The notion of forward manufacturing is not entirely new to the Army. The U.S. Army Tank Automotive Research, Development and Engineering Center had fielded a mobile-parts hospital in the past, the automotive equivalent to the mobile army surgical hospital unit.[8] The Army's Rapid Equipping Force began fielding expeditionary lab mobile units in 2013, which include 3-D printers, computer-assisted milling machines, and laser, plasma, and water cutters, along with common tools like saws and welding gear.[9] The industry is fast approaching a point where even static structures such as buildings may be 3-D printed.[10]

Augmented reality for maintenance and repair. Currently, to do their jobs, mechanics rely on experience with equipment, thick manuals, and rote memorization of many of the maintenance procedures. With new forward manufacturing capabilities, augmented reality goggles can provide mechanics with systematic instructions on how to repair equipment and what tools to use while they perform maintenance procedures.[11]

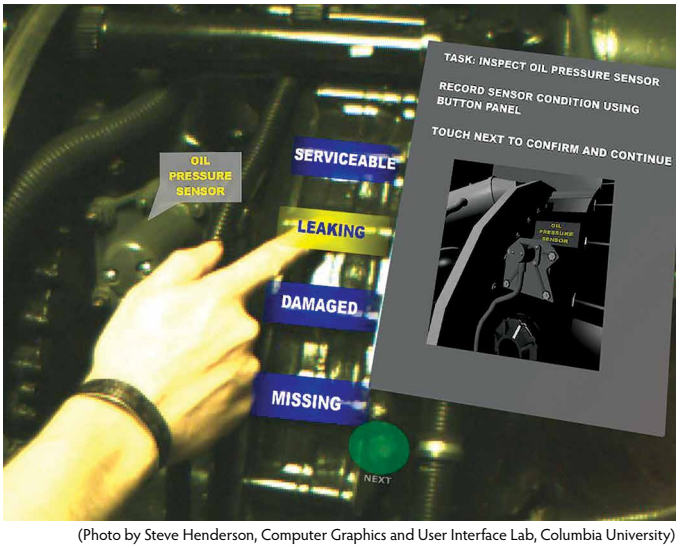
Training reduction. In order to offset training, imagine a future soldier gets into a vehicle and inserts his or her common access card. First, the seat automatically adjusts. Next, a driving display populates with the soldier's custom widgets, similar to a smartphone display. The display also only lists available weapons on which the soldier has qualified. The displays might also help soldiers understand vehicle performance envelopes. For example, a line might be displayed over the terrain showing how sharp a soldier might turn without a rollover. All this functionality could follow a soldier, no matter what vehicle he or she climbs into, negating a large training requirement.

Early synthetic prototyping. The Army Capabilities Integration Center's Early Synthetic Prototyping (ESP) initiative offers a viable methodology to determine what combination of tactics and materiel is optimal over various scenarios.[12] ESP enables thousands of soldiers to tailor tactics, strategies, force structures, and materiel to try to minimize cost while maximizing mission effectiveness. In this way,

ESP may have the potential to harness the free flow of ideas among technologists, program offices, and soldiers to identify and assess concepts early in the design phase at a time when costs are low.

Gaming Is Part of the Process

Gaming is not new to the Army. What is unique about ESP is the idea of launching an ongoing experiment and gaining access to thousands of soldiers' experience and brainpower. ESP players could be anyone from a private fresh out of basic training to a thirty-year veteran with extensive combat experience. Given the dire need of the United States to infuse innovation into its procurement processes and agile responses into acquisitions, the ESP process may lead to a new "revolution in military affairs."[13] The 9/11 Commission Report stated, "Imagination is not a gift usually associated with bureaucracies.... It is therefore crucial to find a way of routinizing, even bureaucratizing the exercise of imagination."[14]



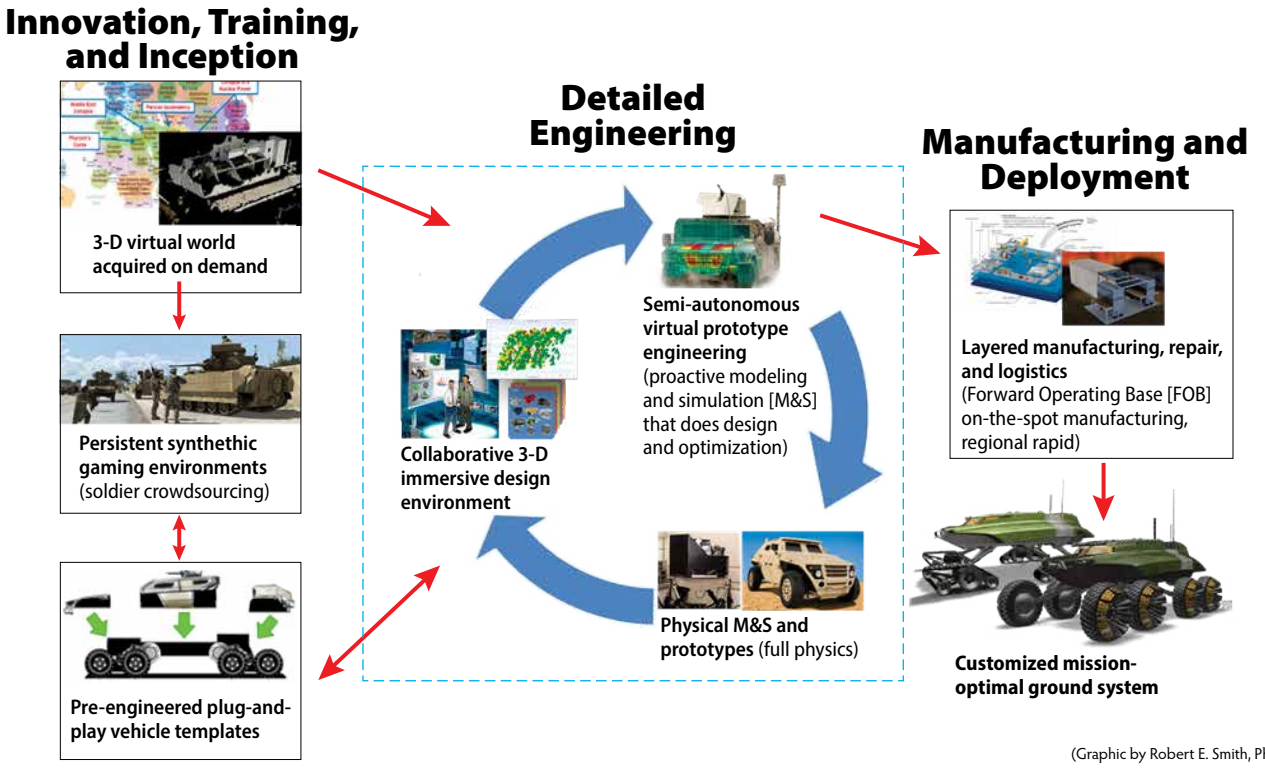
(Photo by Steve Henderson, Computer Graphics and User Interface Lab, Columbia University)

Top: While wearing a tracked, head-worn display, Augmented Reality for Maintenance and Repair (ARMAR) guides a mechanic to complete a maintenance task inside an LAV-25A1 armored personnel carrier. **Bottom:** A user manipulates 3-D virtual buttons while receiving haptic feedback from the underlying grooves of an engine compression section.

Figure 2 shows a notional future process that uses virtual war-gaming with rapid manufacturing to tailor systems and force structures.[15] The entry point into the process starts with ESP (left center) which allows thousands of soldiers to "kick the tires" of capabilities.[16] Soldiers will pool their collective expertise to codesign vehicles with engineers while simultaneously optimizing the best doctrine including force structure. In this way, soldiers will be able to modify vehicles in this synthetic world before any metal is bent, and they can see how their modifications stack up against realistic mission objectives. Potentially, even real-time scenarios will be rehearsed by using unmanned aerial vehicles and satellites to instantaneously create geo-specific environments as shown in the upper left of figure 2.

In order to avoid overwhelming the users with choices from the infinite combination of vehicle technologies and vehicle templates, capability modules will evolve within the gaming environments as shown at the lower left of figure 2. Among such, vehicle templates are preferred configurations of modules and technology that the "crowd" of soldier-gamers conclude provide robust mission effectiveness. The templates will adapt over time as users share among themselves and piggyback on the best ideas.

The gaming environment will help inform trade space exploration by producing a new *tactical utility* metric, which will measure statistical battlefield effectiveness of various engineering solutions over multiple vignettes. Allowing soldiers to test-drive virtual systems in various operations will enable program managers to compare system versatility and tactical utility against cost, schedule, and risk.



(Graphic by Robert E. Smith, PhD)

Figure 2. Ground Systems SE/2025 Systems Engineering Process

Technology Readiness for 3-D Printing Vehicles

The development of the first crowdsourced military vehicle—the Fypmode by DARPA and Local Motors—gives a glimpse of the potential for SE2025.[17] Jay Rogers, founder of Local Motors, points out conflicts are won not by spending large quantities of time and billions of dollars, but "they win it because they figured out what was going to beat the enemy, and they built that".[18] Rogers adds, "Maybe we did not do the same development that [the contractor] did, to make sure the strut on the vehicle lasts a million miles. But if it saves a life, and it lasts for a whole conflict, haven't we done a better thing?"

President Barack Obama was shown the Fypmode vehicle, which only took four months to produce, and enthusiastically pointed out—

> Not only could this change the way the government uses your tax dollars—think about it, instead of having a ten-year lead time to develop a piece of equipment, if we were able to collapse the pace of which that manufacturing takes place, that would save taxpayers billions of dollars—but it also could get technology out to the theater faster, which could save lives.[19]

The newest developments in 3-D printed vehicles debuted at the 2015 International Auto Show in Detroit, Michigan. Oak Ridge National Laboratories and Local Motors collaborated to print a Cobra replica and the Strati, respectively.[20] Since Rogers claims the carbon-fiber-reinforced material has ballistic properties, the next logical step would be for DARPA to invest in a project to see if 3-D–printed armored ground vehicles can be produced to withstand ballistic and underbody threats. It may be possible to embed armor tiles and plates into the body, build compartments to fill with expedient material such as sand, or provide other innovations. The largest drawback currently to 3-D printing technology is that it is difficult to ensure part quality because every machine and process produces parts at a different standard of precision. However, this should not be an insurmountable challenge.

Conclusion

Winning in a complex world requires a new research, development, and acquisition process to boost

the rate of innovation while simultaneously reducing cost. Tailored systems might provide such a capability at a much lower cost by allowing specialized design for regions or possibly for individual battles. Additional utility is gained by making maximum use of modularity to allow systems to adapt. The very nature of this type of vehicle requires an agile systems-engineering and manufacturing process that anticipates many scenarios in advance.

(Photo by Pete Souza, www.whitehouse.gov)

President Barack Obama and Vice President Joe Biden view a 3-D–printed carbon-fiber Shelby Cobra car during a tour of Techmer Polymer Modifiers in Clinton, Tennessee, 9 January 2015.

Using persistent synthetic gaming environments helps achieve this in a cost-effective manner while concurrently considering both tactics and technology. Investment in a new process as described in this article can provide a better return on taxpayer dollars than investing in raw technology. ■

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Biography

Dr. Robert E. Smith is a research engineer in the U.S. Army Tank Automotive Research, Development and Engineering Center's computer-aided engineering group, Analytics. He holds a PhD in mechanical engineering from Michigan Technological University. His research work includes machine-learning, data mining of behavior patterns, systems engineering, and computational fluids. Smith has worked for Ford Motor Company, Whirlpool Corporation, and General Dynamics Land Systems.

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(Photo courtesy of Wikipedia)

The Local Motors' Strati is the world's first 3-D–printed electric car, shown here 20 September 2014. The Strati takes much less time to print and has a rougher finish.

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(Photo by Tech. Sgt. Barry Loo, U.S. Air Force)

U.S. military personnel assigned to Combined Joint Task Force–Horn of Africa (CJTF–HOA) negotiate a water obstacle during a desert commando course 15 March 2016 in Arta, Djibouti. Through unified action with U.S. and international partners in East Africa, CJTF–HOA conducts security force assistance, executes military engagement, provides force protection, and provides military support to regional counter-violent-extremist-organization operations to buttress aligned regional efforts, ensure regional access and freedom of movement, and protect U.S. interests.

Sustainable Readiness and Regional Alignment of Forces

Lt. Col. Chad R. Foster, U.S. Army

The concept of regionally aligned forces (RAF) offers both challenges and opportunities for U.S. Army units at all levels. Perhaps most pressing among the challenges is the need to balance deployment mission requirements with the imperative to sustain an appropriate level of unit readiness over time. No two overseas missions are exactly alike, and every unit has unique characteristics, capabilities, and needs. While this reality precludes a single, standardized solution, examining different

approaches can assist in guiding commanders as they plan, prepare, and execute these strategically important operations across the globe. The following attempts to define the relationship between RAF and the Army's concept of *sustainable readiness* while providing specific practices and observations from a cavalry squadron that recently participated in an RAF deployment as a possible way to approach achieving balance in that relationship.

Sustainable Readiness Model

The Sustainable Readiness Model will empower commanders and is flexible enough to accommodate differing readiness levels given anticipated mission requirements.[1]

—Lt. Gen. James L. Huggins Jr.

The Sustainable Readiness Model is the successor to the Army Force Generation (ARFORGEN) Model that drove manning, equipping, and training cycles from 2006 through 2014. ARFORGEN was a "structured progression of increased unit readiness over time" that cycled battalions and brigades through three "force pools."[2] This model assumed that formations would be unavailable for contingencies immediately following return to home station due to precipitous drops in overall readiness stemming from personnel turnover and a corresponding decline in training proficiency. Following this period (known as "reset"), commanders steadily rebuilt their equipment, manning, and training readiness on a schedule synchronized with the unit's timeline for the next deployment.[3]

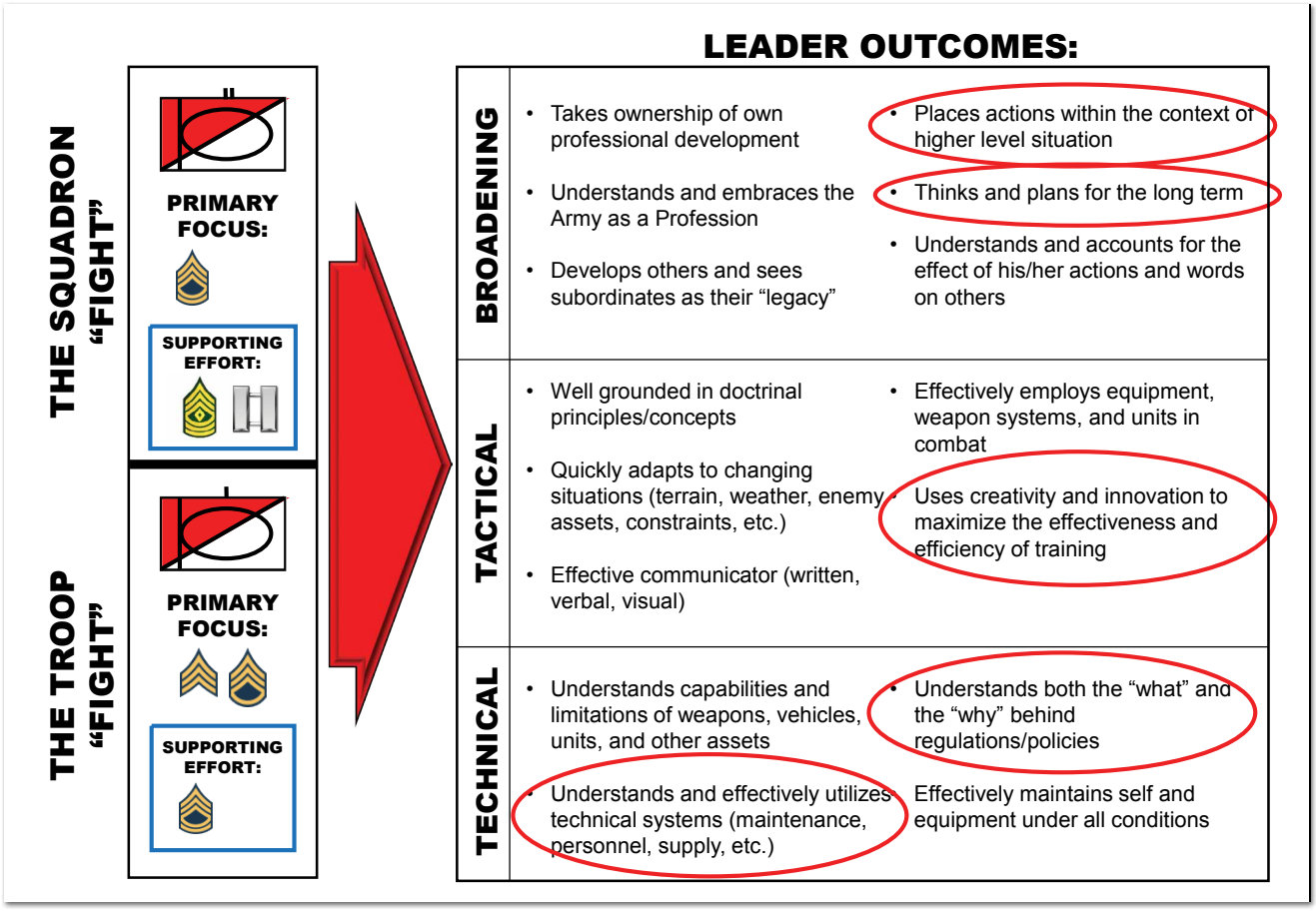
Due to the limited time available between deployments under ARFORGEN, training plans were often dictated by higher headquarters, leaving fewer opportunities for leaders below the battalion level to conduct their own planning and assessments. Though ARFORGEN provided much-needed predictability when yearly combat deployments to Iraq and Afghanistan were the norm, it also limited the Army's flexibility to respond to unforeseen contingencies, as large numbers of recently returned units were, in essence, out of the fight until they could work their way back to the "available" force pool. At the lower levels, the top-down approach to training and preparing for deployment allowed many officers and noncommissioned officers (NCOs) to grow accustomed to having training plans provided by higher headquarters.

In contrast, the central idea behind sustainable readiness is the reduction of the "peaks and valleys" that characterized ARFORGEN.[4] It eliminates the planned period of unit nonavailability following deployments and requires that commanders maintain an acceptable readiness level *at all times*. Exactly what level of readiness is acceptable varies based on the nature of the unit's anticipated deployment. As the Army's number of brigade combat teams reduces to approximately thirty by the end of fiscal year 2017, there is also an increased urgency to avoid readiness "cliffs."[5] The Army must maintain immediate responsiveness and deterrence along a broad spectrum of possible contingencies. Just as ARFORGEN was needed to support the Global War on Terrorism, sustainable readiness is what the Army needs to support RAF.

Sustainable Readiness Tailored to Regionally Aligned Forces

The purpose of RAF is to provide forces that are "specifically trained" and "culturally attuned" to the needs of geographic combatant commanders.[6] For brigades and below, this ideally means special training in language, history, and cultural awareness in addition to their core mission essential tasks. However, more important with regard to sustainable readiness is that a unit's likely mission within the aligned region determines the minimum level of qualification and certification acceptable for commanders. For example, a brigade combat team aligned with U.S. Central Command and deployed to Kuwait as a theater reserve might need to maintain live-fire qualifications at the battalion level in order to accomplish its assigned missions. However, another commander with a different alignment and mission could determine that only certified platoons are necessary. In either case, if the unit falls below that point, higher headquarters must provide the necessary training resources, personnel, or equipment to bring it back above the acceptable level.

As noted, ARFORGEN largely consolidated the management of readiness at the highest levels, but sustainable readiness returns this responsibility to battalion- and company-level commanders. Lieutenant colonels and captains, supported by engaged subordinate leadership within platoons, must effectively project shortfalls and then take proactive measures to smooth over the "peaks and valleys" of readiness. But, since this



(Graphic courtesy of Lt. Col. Chad R. Foster, U.S. Army)

Figure 1. Squadron Leader Development Guidance

is the case, the most important question remains: How can these leaders accomplish this responsibility?

The Decisive Operation: Leader Development

Leaders at all levels face the reality of force and budget reductions, increasing operational requirements, and an ever-changing global situation. Although challenging, this environment provides the ideal conditions to develop the leaders of tomorrow.[7]

—Gen. Robert B. Abrams

The guidance from the highest levels of the Army is clear: commanders must effectively manage personnel turnover, training proficiency, and equipment maintenance in order to remain ready for contingencies. Because there is no way to predict exactly what our forces will be required to do, sustaining the ability to conduct a wide range of military operations at any time is critical.[8] No single solution exists to uniformly guide our battalion and company commanders in this effort, but that fact does not remove the responsibility from their shoulders. The top-down driven readiness cycles of the last decade hampered the professional development of our junior- and mid-level leaders. Under ARFORGEN, young officers and NCOs found themselves as merely the executors of directed training plans. Now these same leaders have ascended to more senior positions of responsibility but are now without the luxury of being told exactly how to prepare their units for deployment.

The challenges of balancing short-term mission requirements with long-term training readiness remain though the formative experiences of the last decade did not fully prepare our company- and battalion-level leaders to do so. Luckily, the absence of a standardized process for balancing RAF missions with sustainable readiness demands that the Army develop leaders who

can tailor their approaches to meet the unique needs of their formations in accordance with the broad intent established by higher headquarters. In short, sustainable readiness is a chance to infuse initiative and adaptability throughout the Army's organizational culture. According to Army Doctrine Publication 6-22, "big picture," to adjust actions to fit changing circumstances, and to get the most out of every training opportunity. Additionally, there was an emphasis on building an understanding of the technical systems, processes, and policies that are at the leader's disposal to manage unit readiness.

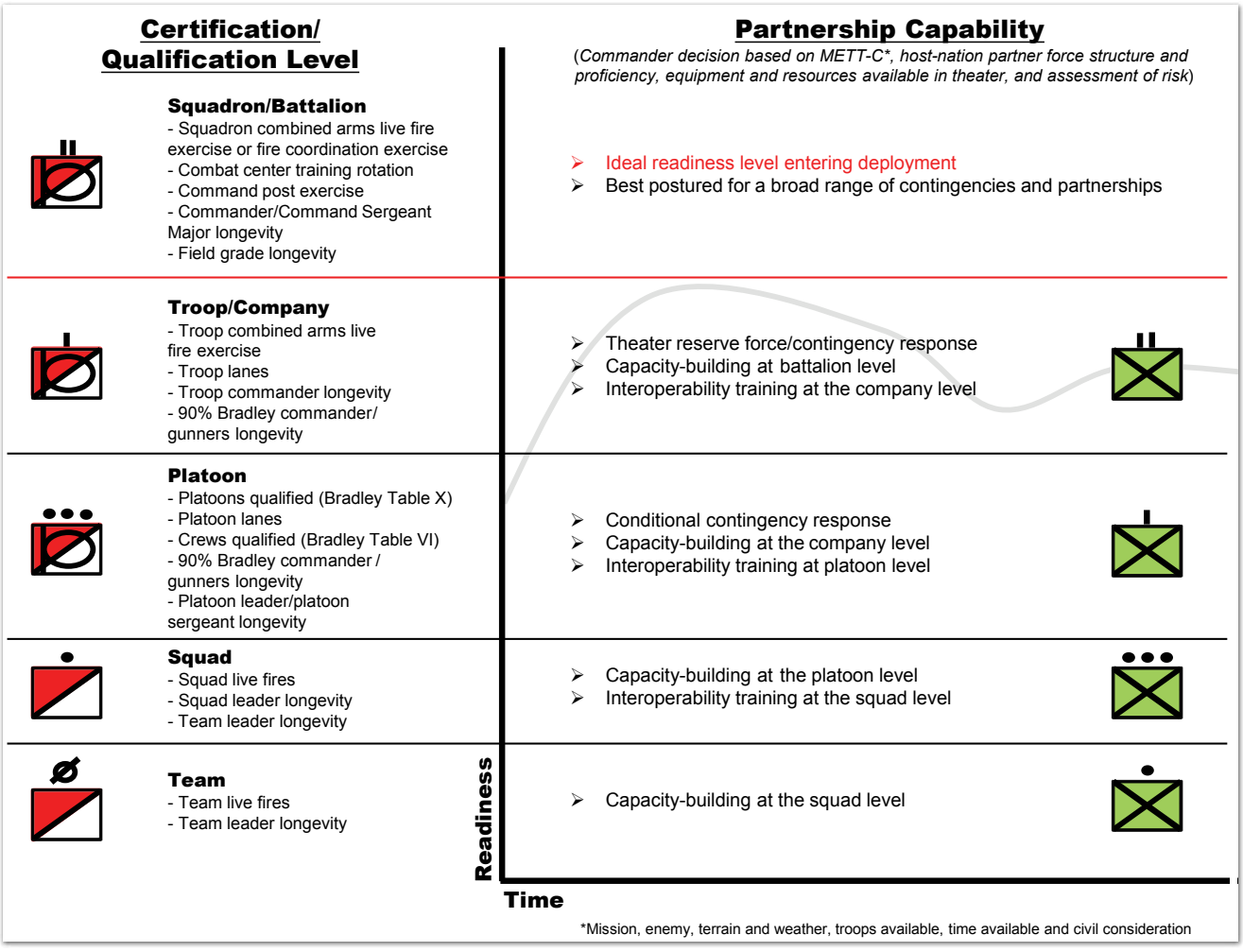
(Photo by Pfc. Craig Philbrick, U.S. Army Africa)

Spanish legionnaires and soldiers from the 4th battalion, 6th Infantry Regiment, 3rd Brigade, 1st Armored Division discuss tactical movements 8 June 2015 in Almeria, Spain, during African Readiness Training 15.

Army Leadership, "difficult and complex situations are the proving grounds of leaders."[9] If that is so, sustaining unit readiness within the current environment of global instability, strategic transition, and budgetary constraints is exactly what our leaders at the battalion level and below need.

Figure 1 summarizes one cavalry squadron's guidance for leader development. This guidance specified the desired outcomes for both officers and NCOs that were developed collaboratively by the troop and squadron command teams with the assistance of key staff. The outcomes circled are those that most directly contributed to the unit's (and the Army's) long-term sustainable readiness. Among the common themes were developing the ability to think ahead, to see the

In order to implement a more holistic leader development program, the squadron sought to go beyond merely scheduling events on the training calendar. The unit integrated leader development into every aspect of organizational activity. In addition to periodic leader professional development sessions, plans for each training event (regardless of echelon) included those outcomes from figure 1 that the event would address, as well as how the trainers expected to observe and assess the results of their efforts. Outside of specific training events, the squadron chain of command had to discipline itself to provide effective, minimal guidance for missions in order to allow troop commanders and subordinate leaders the maximum latitude to exercise initiative and to leverage creative thinking at the lowest levels possible.



(Graphic courtesy of Lt. Col. Chad R. Foster, U.S. Army)

Figure 2. Training Readiness Levels for Regionally Aligned Forces Partnership

A telling example of this principle in application was one troop commander's efforts to improve the unit's partnership with a host-nation border guard force (BGF) and further build the capacity of those forces. When the troop arrived in the summer of 2015, the BGF training program consisted of a well-established basic course of instruction for new recruits. Operating within the squadron commander's guidance to provide (within unit capabilities) what the host-nation forces assessed as their most important training needs, the troop commander sought out key host-nation leaders and established a series of functional training courses that addressed the most urgent needs identified by the BGF unit commanders in the field. These included an Advanced Training Course for company-level officers, long-range marksmanship instruction for unit snipers, and mortar training. With only a broad set of guidance and few specific directives, the troop commander and his team met the squadron commander's intent perfectly, and, in the process, provided a unique professional development experience for himself and the young officers and NCOs under his command.

Leader Development and the Sustainable Readiness Model

Effective leader development is decisive to implementation of sustainable readiness and, therefore, to RAF. Adaptive and empowered leaders will figure out a way to meet their commander's intent regardless of changing conditions or new missions. As anyone who has deployed recently to any of the aligned theaters

(Photo by Staff Sgt. Gregory Brook, U.S. Air Force)

Scout sniper team marksmen from the Reconnaissance Platoon, Company B, 2nd Battalion, 124th Infantry Regiment, 53rd Brigade Combat Team, Florida Army National Guard, work with their spotters to zero their rifles prior to beginning a live-fire long-range marksmanship training and qualification course at the Arta training range in Arta, Djibouti, 14 October 2015.

can likely attest, there is a wide range of contingencies that can arise as each region contains many countries with different languages, cultures, and environmental conditions within which U.S. forces must be prepared to operate. Only through effective leader development can units ensure that they are postured for success regardless of where they land and what they are ordered to do.

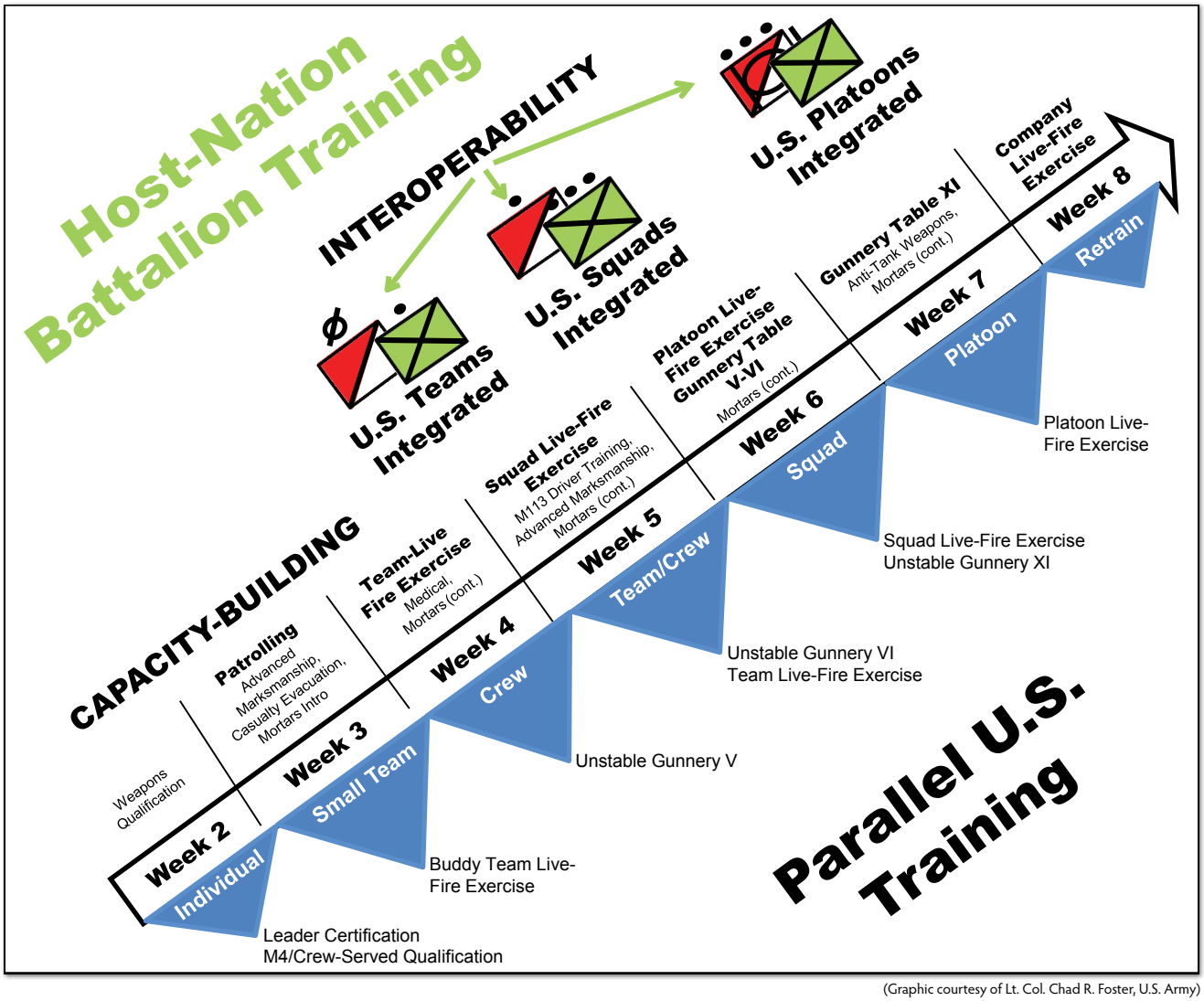
Maximizing Opportunities: Partnered Training for RAF and Sustainable Readiness

Where the U.S. Army has striven to build partnership capacity among partner armies in complex operating environments, the need to promote professional NCO development has been one of many key lessons.[10]

—Joseph Rank and Bill Saba

The immediate mission requirements of RAF and the long-term demands of sustainable readiness are often in conflict, and commanders and subordinate leaders are faced with the challenge of finding an effective balance between the two. Prior to a deployment, units prepare for the most difficult mission that they could be asked to do while still training for any theater-specific requirements associated with the projected mission. Especially at the battalion level and below, units work hard to gain the highest level of collective proficiency in live-fire and combined-arms maneuver, both as a prudent preparatory measure and as a hedge against the natural decline in individual and collective proficiency that could occur during deployments.

While overseas, many factors such as unavailability of combat vehicles and other resource limitations can constrain training plans. Live-fire qualifications can grow out of tolerance, and significant time can pass between opportunities for a unit to practice critical collective tasks. This natural atrophy in training readiness is a problem that commanders engaged in a



(Graphic courtesy of Lt. Col. Chad R. Foster, U.S. Army)

Figure 3. Host-Nation and U.S. Training in Parallel

RAF deployment must manage for both the mission at hand and the unit's sustainable readiness.

Figure 2 (page 120) shows a way of looking at the problem from the squadron/battalion perspective. This chart defines the qualification and certification levels that a commander could designate as the minimum necessary for various corresponding levels of partnership with host-nation forces. These minimum training-readiness levels are the product of different factors, to include analysis of the mission and the commander's assessment of both his own formation's capabilities and those of the host-nation partner. This sliding scale fits the intent of the Army's Sustainable Readiness Model by establishing a flexible framework that allows commanders room to maneuver in managing the specific challenges of their deployment mission.

At the strategic level, RAF deployments seek to "build trust and confidence between the United States and the host nation through understanding facilitated by enduring engagements."[11] At the tactical level, this translates to U.S. forces training with counterparts to build capacity and interoperability based on guidance from the country team and the specifics of the agreement between the two governments. In these cases, interoperability training can serve as an effective vehicle to both enhance partner capacity and increase a unit's sustainable readiness.

An example of this technique would be a U.S. company integrating squads into a host-nation platoon situational-training exercise supervised overall by U.S. trainers. In this way, the U.S. company commander is able achieve his own training objectives at the squad

level while his forces simultaneously build capacity with their partners.

Figure 3 illustrates an approach utilized by one cavalry troop to progress to platoon live-fire certification in parallel with their capacity-building efforts with a host-nation partner. Along with separate U.S.-only training and leader certification, the troop commander chose to integrate his units into training with partnered forces, usually at one echelon below that of the host-nation unit. These U.S. elements fired and maneuvered alongside their partners, setting a strong example and learning how to operate effectively with a foreign ally. This practice allowed the commander to meet his own sustainable readiness objectives while simultaneously accomplishing his RAF mission. In this way, the training became a truly developmental experience, adding an additional level of complexity to the exercises and further contributing to the interpersonal-relationship building that is so vital to RAF partnerships.

Although situations differ from country to country, a common shortcoming among potential RAF partners is a lack of an empowered and professional NCO corps. Strong NCOs are a prerequisite for small-unit operations, and many partners greatly desire assistance in developing noncommissioned leaders. There are often many cultural and administrative obstacles to overcome in this area, making the task seem daunting. However, no other initiative by a deployed U.S. unit will have a longer-lasting impact than an effective NCO development effort.

Yet again, partnered training offers many opportunities to address this strategically important need. Setting the example through our own NCOs is the first step in overcoming existing host-nation obstacles. Whenever possible, U.S. NCOs should be the "face" of training as they strive to build partner capacity. During interoperability exercises, the on-the-ground leadership of our young sergeants provides host-nation partners with a model to emulate. Unfortunately, this is normally insufficient to get past the highly centralized and officer-centric traditions and force structures within many host-nation armies. In order to make a significant impact, U.S. forces must find a way to build the immediate credibility of host-nation NCOs with their soldiers and officers. Doing so requires a determined and continuous effort.

One of the most effective ways to assist in the development of both proficiency and credibility among the host-nation unit's NCOs is to arm them with the requisite knowledge and skills through a deliberate certification process. This technique is merely the application of standard U.S. Army training doctrine to an RAF mission. At a predetermined interval prior to the conduct of major training events, U.S. trainers can lead classes, receive back briefs, and conduct rehearsals with partnered-unit NCOs in order to enable them to lead their own soldiers through training with minimal U.S. assistance on the day of execution. A simple example of this is U.S. trainers conducting classes and a walk-through rehearsal of range operations with host-nation NCOs a few days prior to that unit's execution of weapons qualification. More advanced tasks might require multiple preparatory sessions, but the payoff of these training-and-certification efforts will be significant: host-nation enlisted leaders will earn the confidence of their subordinates and superiors. This is the most important legacy that a unit can leave behind from a RAF deployment.

Conclusion: Challenges and Opportunities

Our fundamental task is like no other—it is to win in the unforgiving crucible of ground combat. Readiness for ground combat is—and will remain—the U.S. Army's #1 priority.[12]

—Gen. Mark A. Milley

The chief of staff of the Army has declared unequivocally that maintaining readiness for ground combat is our top priority. While this declaration is not something new, the obstacles to sustaining such readiness are many. Some argue that a scarcity of time brought on by a consistently high operational tempo is the biggest challenge. Others see budgetary constraints resulting from sequestration and global economic turbulence as the primary concern. While there is no doubt that these are significant issues, the most severe problem across the entire Army may well be a shortage of trained and certified leaders due to more than a decade of dictated training-and-resourcing cycles. The ARFORGEN model stunted the growth of those NCOs and officers who today hold many of the key leadership and staff positions at the company, battalion, and brigade levels. Because of the top-down training

plans prevalent under ARFORGEN, these individuals did not always have the important formative experiences that their predecessors enjoyed in developing, executing, and assessing training plans at the lower levels. Despite this harsh reality, the responsibility to sustain unit readiness remains on the shoulders of these leaders.

The imperative to remain ready to fight is as urgent as ever. Sustainable readiness is not just a model to support RAF; it is a crucible through which the Army can produce the type of resourceful, adaptive, and empowered leaders that it needs to carry us into the future. For every obstacle, there are also opportunities. The specific observations offered above are only possible approaches to taking advantage of these opportunities. No single panacea or prescriptive step-by-step procedure exists to overcome the challenges that accompany the Sustainable Readiness Model and concept. Our officers and NCOs must find a way to meet the chief of staff of the Army's intent, even in the face of continued deployments and constrained resources at home station. Regardless of what the future holds or what our forces are asked to do, the U.S. Army must be ready. ■

Biography

Lt. Col. Chad R. Foster, U.S. Army, is commander of the 4th Squadron, 10th Cavalry, 3rd Armored Brigade Combat Team, 4th Infantry Division at Fort Carson, Colorado. He holds a BS from the United States Military Academy at West Point, New York, and an MA from the U.S. Naval War College in Newport, Rhode Island.

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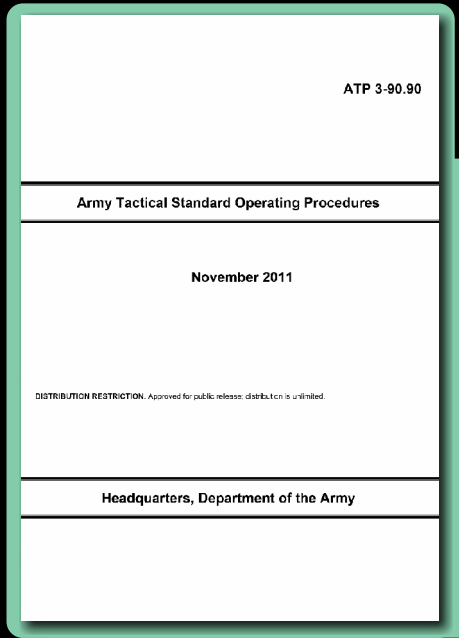


MR We Recommend

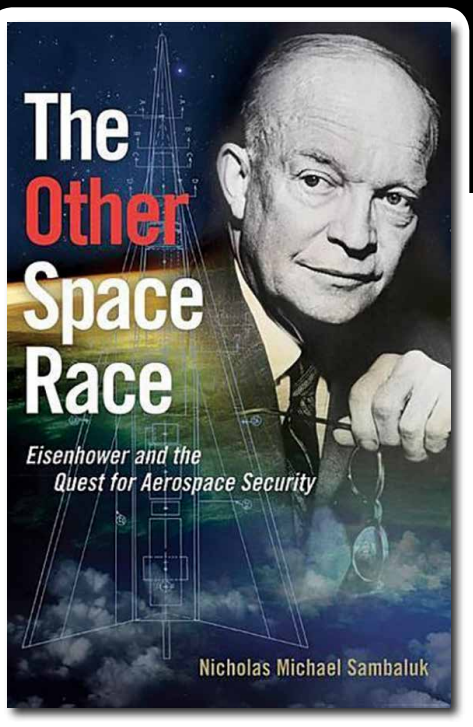
FOR THOSE STRUGGLING TO WRITE STANDARD OPERATING PROCEDURES. The task of developing unit-level standard operating procedures (SOPs) incorporates complex operational processes as well as aspects of authoring, instructing, and using collaborative technology. Army Techniques Publication (ATP) 3-90.90, *Army Tactical Standard Operating Procedures,* brings together practical guidance for all these features of SOP development. It includes resources such as a tailored writing process soldiers can use to develop efficient procedures and effective instructions for their use. This doctrine may be found at: http://armypubs.army.mil/doctrine/DR_pubs/dr_a/pdf/atp3_90x90.pdf.

REVIEW ESSAY

The Other Space Race

Eisenhower and the Quest for Aerospace Security

Nicholas Michael Sambaluk, Naval Institute Press, Annapolis, Maryland, 2015, 316 pages



Lt. Col. John H. Modinger, PhD, U.S. Air Force, Retired

The Other Space Race is fascinating look at the early years (1954–1961) of the celebrated "Space Race" between the United States and the Soviet Union. It is full of fascinating sidebars fleshing out the context of the times in vivid detail and peaking with the lunar landing in 1969.

Regrettably, until now, President Dwight D. "Ike" Eisenhower's role has received rather superficial treatment in this race saga. Many mistakenly derided his administration as being caught off guard by the Sputnik launches and supposedly playing mere catch-up. However, *The Other Space Race* highlights an important reality: Eisenhower was far more programmatic in his approach to space and more intimately involved in the strategic policy-level decision making than is generally acknowledged. Much of this oversight is understood through the lens of his leadership style. Historian Stephen Ambrose, an Eisenhower biographer, noted that Ike "had gotten through many a crisis simply by denying that a crisis existed." In the aftermath of Sputnik, his usual resort to calmness failed to quell the uproar, but his ability to shape the direction of U.S. space exploration would influence policymaking thereafter.

The book is much more than an account of Eisenhower's personal involvement. The inherent tension is clearly exposed between Ike's desire to use space as a window into Soviet capabilities to prevent misperception and worst-case thinking— quite possibly leading to nuclear Armageddon—and the Air Force's contrarian approach foreseeing space weaponization as inevitable. A newly independent, brash Air Force viewed itself as the vanguard of American defense in a future dominated by spiraling technological feats where second place—so its leaders argued—would consign the Nation to certain doom against a relentless Communist foe intent on domination.

Sambaluk unambiguously illuminates how disconnected Air Force senior-leader thinking was from the strategic initiatives Eisenhower was trying to crystallize at the dawn of a new frontier. A clear example of these competing philosophies regarding how best to achieve space security was the "Dyna-Soar" project. A focal point throughout the book, it was a piloted, reusable, boost-glide spacecraft that launched like a rocket and recovered by landing like an unpowered glider. To supporters, Dyna-Soar would enable the United States to control the "ultimate high ground." To detractors, the project

was an overly ambitious fantasy given the state of many necessary supporting technologies, was fiscally irresponsible during a recession, and jeopardized the peaceful methods Eisenhower was keen on pursuing to keep a lid on competition and expenditures. In a telling comment, Sambaluk has a bit of fun noting Dyna-Soar would eventually go the way of the "dinosaur," but acknowledges that in 1957, in the hysteria following Sputnik, it seemed quite possible that it would go from concept to creation, with all that entailed.

Sambaluk lucidly explains Ike felt that the superior American space technologies could pierce the seemingly opaque Soviet military system. He was supremely confident satellites, once operational, would expose the so-called "bomber gap" and "missile gap" as gross distortions of reality, derailing agendas demanding ever greater spending on yet more weapons of war—or so he thought. Eisenhower's "Open Skies" initiative sought tangible verification of capabilities through routine, unencumbered space overflights; however, Khrushchev, suspicious of sinister designs, thwarted the proposal. Of course, once Sputnik was aloft and transmitting, overflight became a nonissue and actually facilitated Eisenhower's goal, since Sputnik's successive orbits set a precedent by default when the United States did nothing to hinder its path.

"Gently in manner, strongly in deed" defined Ike's approach to politics. His distinct leadership style forged combined allied military victory in World War II by helping him to manage the ceaseless juggling of fractious agendas, competing priorities, and clashing personalities. That same wholesome, friendly demeanor and tact served him well through his first presidential term. With great nuance, Sambaluk compellingly argues this executive style—the hidden hand—worked well when the international scene was relatively tranquil. But, when the situation became tumultuous, Eisenhower's style was often misinterpreted, or mischaracterized as disengaged, out of sync, and aloof.

The author artfully captures Eisenhower's persistent frustration in trying to regain control of the initiative in the space race while tamping down unbridled, expensive, and antagonistic programs, which continually threatened to slip the leash in the wake of Sputnik I and II and further destabilize Cold War relations. Certainly, much of Ike's heartburn in this area is attributed to his unwillingness to compromise classified insights that would have thrown cold water on ridiculous claims about the true state of affairs. The book marvelously captures Ike's disdain for getting down in the political trenches that did not help his cause. He saw himself as a unifier who refrained from engaging in overly partisan politics. Ike also had an abiding faith that "public opinion is the only motivating force there is in a republic or in a democracy," and he was loathe to defy it. He felt "public opinion must be … informed … if it is going to be effective." This was a real test for the average citizen, putting aside their mostly pedestrian concerns, given the classified and complex nature of many of the issues.

In his "Epilogue and Conclusion," Sambaluk succinctly analyzes larger themes of the time: the transition from Eisenhower to John F. Kennedy, and Air Force rationale for pushing so hard in seeming opposition to Ike's goals. Near the end, he delivers a few diamonds. First, in Kennedy's worldview, international politics drove the moon-landing race. He once told the NASA director, quite candidly, that if not for that imperative, "we shouldn't be spending this kind of money, because I'm not that interested in space." This would come as a shock to those who so closely associate Kennedy with the moon mission. Second, by the mid-1960s, NASA's public affairs office was saying "we are in a new phase of our program … each flight is not going to be spectacular" and it recommended NASA leadership should "discourage … activity, such as ticker-tape parades" for future astronauts. Again, this runs against the grain of prevalent contemporary thinking on the subject, and the author captures it eloquently. Finally, he provocatively suggests Eisenhower's now-revered farewell address, which cautioned American society about the insidious and growing power of the military-industrial complex, "represented an admission of defeat more than a warning for the future."

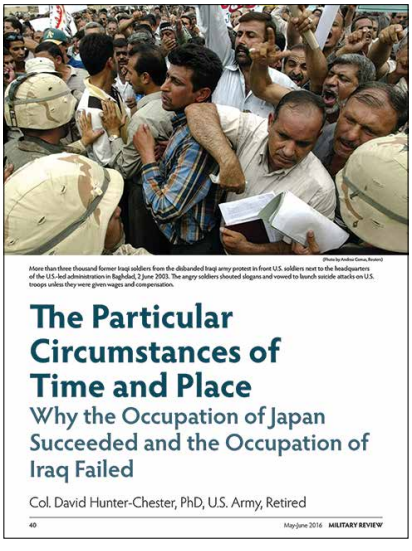
Overall, a splendid rendering of the behind-the-scenes complexities of early American space-policy formation as leaders wrestled with appropriate responses and future direction at the height of an increasingly heated Cold War. ■

Biography

Dr. John H. Modinger, lieutenant colonel, U.S. Air Force, retired, is an assistant professor in the Department of Joint Interagency and Multinational Operations at the U.S. Army Command and General Staff College, Fort Leavenworth, Kansas.

LETTER TO THE EDITOR

Response to Col. David Hunter-Chester, "The Particular Circumstances of Time and Place
Why the Occupation of Japan Succeeded and the Occupation of Iraq Failed"



(Military Review, May–June 2016)

William Thayer

I think this was a good article, but let me add a few things that I think are critically important. First, in Iraq (and throughout the Middle East), there is a Sunni-Shiite religious divide that has been hostile for 1,400 years. There was no such similar divide in Japan (e.g., Shinto vs. Buddhist).

Second, as the author points out, Japan had some time with a democracy. There has never been a democracy in Iraq, and the expectation that such a democracy could be developed within a year was totally unrealistic.

Third, when the Japanese surrendered, they all surrendered. There was no additional fighting or killing. In contrast, after the Saddam Hussein ouster, the fighting and killing got worse.

Fourth, in Japan, the United States did not have to fight nonuniformed terrorists. In Iraq, the United States did have to fight terrorists targeting both the U.S. and Sunni/Shiite populations.

The United States has not learned to fight the nonuniformed terrorists well. It did better against the German Werewolves with the Fragebögen (questionnaires) and other techniques. There should be a similar article on Germany vs. Iraq.

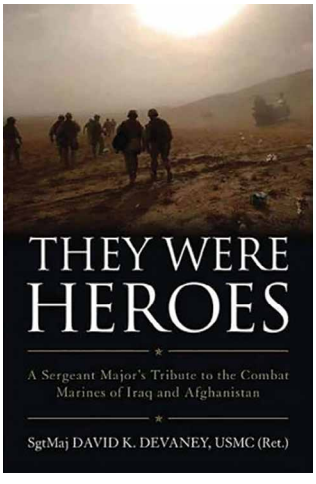
William Thayer, San Diego, California

BOOK REVIEWS

THEY WERE HEROES
A Sergeant Major's Tribute to the Combat Marines of Iraq and Afghanistan

Sgt. Maj. David K. Devaney, U.S. Marine Corps, Retired, Naval Institute Press, Annapolis, Maryland, 2015, 296 pages

Do we as a nation show our appreciation and properly recognize the sacrifices our service members make? In *They Were Heroes,* Sgt. Maj. David Devaney does just that by commemorating the heroism and sacrifices marines made during the wars in Iraq and Afghanistan. After Devaney's visits with wounded warriors at the Bethesda National Naval Medical Center—now merged with Walter Reed Army Medical Center—he wanted to share their stories with the world. Devaney was encouraged to tell the stories of those heroes after sharing them with the U.S Naval Institute's editorial board for *Proceedings* magazine.



The book has three distinctive sections: anecdotes from battles in Iraq, from battles in Afghanistan, and from assistance calls by casualty assistance calls officers (CACOs). Every story is different. However, each provides a compelling account of marine bravery in the face of adversity. Devaney helps readers vicariously experience combat by effectively recounting the details of each battle and event. Each story's details are collected from the statements of those who survived the ordeal and lived to tell the story. Stories of the battles are told with enough detail to provide a clear picture of the environment and conditions in which the marines fought. Also, Devaney minimizes military jargon to facilitate easy reading for nonmilitary readers.

One unique aspect of the book is the stories of two CACOs. Those are the stories that are not familiar to the public. The stories, starting from the CACOs' initial notification to the fallen hero's family, to the completion of the CACOs' duty, bring closure to the marines. Devaney also included the correspondence between himself and the family members of fallen Marine Cpl. John R. Stalvey to help bring awareness of sacrifice that families made alongside our fallen heroes.

Additionally, Devaney provides the award citations for all fifty-two stories to support the stories of heroism of our marines. These citations capture the essence of the marines' heroic acts and provide further details of the battles—a great way to show the impact of each marine's actions and sacrifices on others' lives.

This book is highly recommended to all. Devaney delivers a good reminder that we are a nation at war, and the price is the lives of those answering the Nation's call. Additionally, Devaney's contribution to recognizing and reminding us of our service members' sacrifices is a great reason to read this book.

Maj. Yong C. Choe, U.S. Army, Fort Leavenworth, Kansas

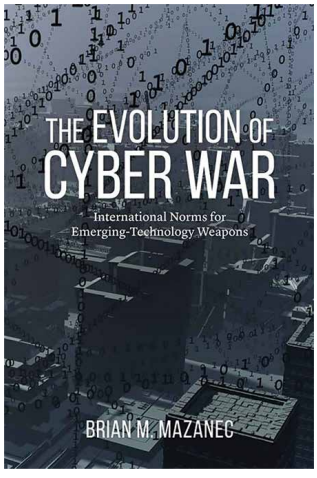
THE EVOLUTION OF CYBER WAR
International Norms for Emerging-Technology Weapons

Brian M. Mazanec, Potomac Books, Lincoln, Nebraska, 2015, 352 pages

This book looks at the development of norms for cyber war: what should be fair game and what is not? How do these norms emerge, and what is the process of developing these norms?

The author, Brian Mazanec, lays out his "norm evolution theory" in an analytical framework that considers actors, motives, and other material and nonmaterial factors. His theory indicates that the development of norms goes through three stages: norm emergence (where the norm comes into existence), norm cascade (a tipping point where the norm's international adoption accelerates), and norm internalization (where states and actors accept it).

Mazanec applies this framework to three historical case studies: the development and accepted use of chemical and biological warfare, strategic bombing, and nuclear weapons. In each of his three case studies, he closely examines the impact of the variables during each of the three stages. He devotes a separate chapter to each of the three case studies. At the end of each chapter, he includes a summarization table that indicates which factors were of greater significance in developing the norms.



Based on his findings in the three case studies, he lays out how he believes the emergence and development of norms will proceed for cyber war. He presents primary and secondary hypotheses to examine candidate norms for emerging cyber warfare. He also looks at recent known cyberattacks (such as the 1982 Trans-Siberian Gas Pipeline, 2007 Estonia, 2007 Operation Orchard, 2008 Georgia, 2009 Stuxnet, 2012 Saudi-Aramco, and 2012 Operation Ababil) to further refine the likelihood of these candidate norms and who the leading advocates will likely be for their development, and opines why.

He includes a chapter on conclusions and lists four recommendations for U.S. policymakers to consider as the world continues to expand operations into cyberspace.

Mazanec certainly has the credentials and background to examine this topic. The book is well written from start to finish and flows in a logical manner. He does a good job with definitions and includes a page of pertinent acronyms. I would recommend this book more for strategic policy makers than for students of cyber war.

Lt. Col. George Hodge, U.S. Army, Retired, Lansing, Kansas

COUNTERINSURGENCY AND THE UNITED STATES MARINE CORPS

Volume 1, The First Counterinsurgency Era, 1899–1945

Leo J. Daugherty III, MacFarland & Company, Inc., Publishers, Jefferson, North Carolina, 2015, 412 pages

This work appears to be "straight history," recounting events in the development of the U.S. Marine Corps as an institution. Leo Daugherty provides the expected chronology for marine interventions in the Philippines, Caribbean islands, Central America, and the Pacific. The historical narrative delivers sufficient political context for marine counterinsurgency (COIN) and related operations, accounts of institutional and field decisions, combat actions, and summaries of "lessons learned" in fine style.

Daugherty weaves three major interpretive threads into his factual account. The first is the evolution of the 1940 *Small Wars Manual*—considered by marines as the "bible" for irregular warfare. (It was not another instructional drill book.) The second was the transformation of education and training supporting marine warfighting generally, but COIN in particular. Foremost were the various Marine Corps schools, educating resident student officers to think in complex environments where "cookbook" solutions could not be had. The last thread deals with the emerging requirement for unique formations possessing special skills—Marine Raider and parachute battalions in the Pacific War—intended to fight behind enemy lines and employ lessons learned from years of conducting COIN in austere environments.

Of particular interest is Appendix A, "A Creditable Position: James Carson Breckinridge and the Development of Marine Corps Schools," by Troy Elkins. It's clear why Daugherty included this piece, since education—not merely training—is indispensable to successful counterinsurgency.

Today's education imperatives reflect quite old requirements, such as Breckinridge's 1929 demand for greater critical thinking capability in military leaders. He tried to overcome his students' tendencies to give solutions to problems they believed their instructors wanted, not ones they felt best fit the situation. Our

current conceptions on adult education are evident in Breckinridge's efforts that aimed "to prevent students from passively accepting information given to them." Instead, "students learned to analyze critically a broad spectrum of information in order to avert narrowness of thought and instill intellectual curiosity and initiative."

Most controversial was the creation, brief employment, and disbandment of marine special forces. Marine Raider and parachute battalions were configured for waging irregular and unconventional warfare in the enemy rear area. Their creators had extensive experience in counterinsurgency and wanted to create problems for the Japanese. The marine commandant made his wishes known that there would be no "special" or "elite" units in the corps, but such efforts persisted. Daugherty describes how these formations were never employed the way their advocates originally intended, and both types of battalions—Raider and paramarine—were eliminated by mid-1943. Despite this, a number of marine COIN advocates earned their spurs in such units; some, like Victor "Brute" Krulak, would shepherd their COIN conceptions well into the second half of the twentieth century.

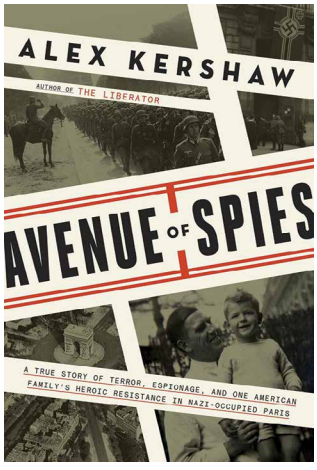
Recommended for professional and academic specialists in COIN operations, *Counterinsurgency and the United States Marine Corps: Volume 1* brings together wide-ranging scholarship on a little-known segment of twentieth-century American military development. It also generates fodder for current debates on how to best educate leaders and organize forces for COIN within a conventional force.

Col. Eric M. Walters, U.S. Marine Corps, Retired, Fort Lee, Virginia

AVENUE OF SPIES
A True Story of Terror, Espionage, and One American Family's Heroic Resistance in Nazi-Occupied Paris

Alex Kershaw, Crown Publishers, New York, 2015, 320 pages

Alex Kershaw's biographical novel about an American physician in German-occupied Paris, with his masterful storytelling, captures the reader's attention and poignantly encapsulates the situations of those involved. Kershaw is a well-known, bestselling history author. His previous works include *The Bedford Boys*, *The Longest Winter*, and *The Liberator*, all centered on various World War II events. He weaves the tale with first-person accounts, anecdotes from established historical tomes, and even legal transcripts from the aftermath of World War II. Kershaw's thoroughly researched and unbiased writing allows the reader to experience all the emotions and complexity of the story.



Avenue of Spies is the saga of Dr. Sumner Jackson, his wife, Toquette, and his son, Phillip, in German-occupied France during World War II. Jackson, a renowned American physician who served valorously in World War I and after the war, settles in Paris with Toquette and works at the American Hospital in Paris. After many happy and peaceful years, the terror of the Third Reich descends upon the city, and the Jacksons face an agonizing decision: to aid in the various resistance efforts or to stand by idly and protect themselves. This is the conundrum of a moral courage decision. If the Jacksons help the resistance and are caught, the punishment will be swift and ruthless. If they do nothing, then they violate their own internal values system. Then what lesson have they taught their son?

Ultimately, the Jacksons choose to help the resistance in various ways, while living just houses away from the Gestapo and their horrific torture chambers. The tension and fear felt daily by the Jacksons leap off the pages, but hope and conviction are stronger than fear. The only question is, how long will the Jacksons' luck hold?

This superbly written book should be on the reading list for every leader, uniformed or otherwise. Much in the same vein as Laura Hildebrandt's *Unbroken*, the story forces the reader to assess his or her own moral and value systems. The brilliance of this book is the lack of a thesis or hypothesis; rather, Kershaw focuses on highlighting the narrative of a single American family in an extraordinary situation. He allows the reader two opportunities: (1) to learn about the bravery of

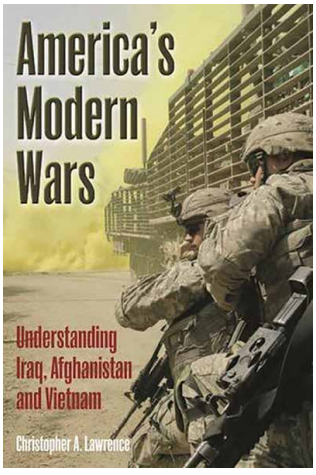
noncombatants and (2) to ascertain their own lessons and messages directly from those involved. *Avenue of Spies* is a true and riveting account of courage, commitment, and resilience in the face of true evil.

Maj. Laura Freeland, U.S. Army,
Fort Lee, Virginia

AMERICA'S MODERN WARS
Understanding Iraq, Afghanistan and Vietnam

Christopher A. Lawrence, Casemate Publishers, Havertown, Pennsylvania, 2015, 376 pages

Analyzing the outcomes of historical events can assist leaders in their future decision-making processes. Christopher Lawrence provides a well-researched and well-analyzed study of the nature of insurgencies and guerrilla warfare since World War II. He conducted his analysis in conjunction with The Dupuy Institute's long-term insurgency research. Their research provides a unique quantitative historical analysis of this subject using a wide array of influencing factors to anticipate the outcome of a particular type of insurgency. However, Lawrence does not dismiss the unpredictability of the human element in his conclusions.



Over the past forty years, strategic and tactical counterinsurgency thinking has had limited advancement. The author looked at a number of variables that affected the outcomes of insurgencies as a means to advance knowledge in this area. Specifically, the author uses data from numerous cases since World War II to illustrate how selected variables have affected the outcomes of insurgencies and counterinsurgencies. He also examines conditions where there was no decisive winner. His analysis includes comparing and contrasting specific variables (e.g., terrain, location, sanctuary, and others) and, then, considers thoughts from renowned insurgency theorists. Overwhelmingly, the data he analyzed proves that force ratios and insurgent causes are the two most important factors that influence insurgencies.

The author and the Dupuy Institute use selected models to predict the outcomes of insurgencies. The results of these models continually produce patterns showing that the motivation of insurgents and high force ratios are key factors that influence success in either insurgencies or counterinsurgencies. Taking into consideration these two key variables, along with the results of his studies, Lawrence argues that the United States has engaged in counterinsurgencies with half or less of an optimum number of forces.

During the Gulf War in 1990–1991, the Dupuy Institute used their combat model to provide multiple casualty estimates to the U.S. House of Representatives for an intervention into Kuwait. The accuracy of their model's prediction was noted by many authoritative sources. Subsequently, the Department of Defense contracts the institute to provide estimates for the recent conflicts in Iraq and Afghanistan. It bases its estimates on data from previous insurgencies, and results are in line with actual casualties. Using various factors, based on historical data discussed throughout the book, the author shows how best the United States can project power and eliminate the previous pitfalls.

Lawrence is clear that the methodology in his research cannot predict the outcome of a future insurgency. However, his measures of research have shown consistent validity and reliability in their outcomes. The analysis of historical data demonstrates that affected military interventions, specifically insurgencies in this study, can assist planners to anticipate possible outcomes. Lawrence and the institute explain and show how their models closely estimated the actual outcomes of events in Afghanistan and Iraq. Furthermore, the analysis using their models provides a logical estimate of what it would have taken for the United States and allied forces to be successful in Vietnam.

Lawrence's book shows that reliable outcome estimates are determined through quantitative reasoning. Being able to anticipate the outcomes of any military operation, through reliable means, can greatly assist in strategic and operational level leaders' decision-making processes. These results are what the book brings to

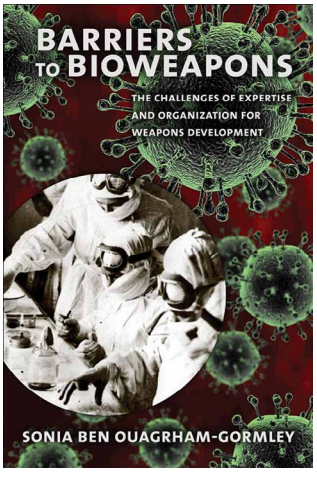
light for military leaders and their staffs. Staff members who develop course-of-action recommendations can use the techniques described by Lawrence to provide quality analysis. Commanders will have the confidence from their staff estimates to choose the best courses of action for future military operations. Logically estimating the outcomes of future military operations, as the author writes, is what U.S. citizens should expect and demand from their leaders who take this country to war.

Brig. Gen. John C. Hanley, U.S. Army, Retired, New Berlin, Wisconsin

BARRIERS TO BIOWEAPONS
The Challenges of Expertise and Organization for Weapons Development

Sonia Ben Ouagrham-Gormley, Cornell University Press, Ithaca, New York, 2014, 240 pages

President Bill Clinton reportedly read Richard Preston's *The Cobra Event*, the terrifying fictional story of a viral bioterrorist attack against New York City. The novel seems to have had an impact on Clinton, more so perhaps than the nonfiction strategy documents of his predecessor. In President George H.W. Bush's 1993 *National Security Strategy*, the last of his presidency, the term "biological" was mentioned only four times, and the focus was on arms control measures and the need to "press for a full accounting of former Soviet biological warfare programs."



With *Cobra Event* on his bookshelf, Clinton's 1998 *National Security Strategy* devoted entire sections to the perceived biological weapons threat: "The Administration has significantly increased funding to enhance biological and chemical defense capabilities and has begun the vaccination of military personnel against the anthrax bacteria, the most feared biological weapon threat today." The document also highlighted terrorist use of biological weapons, and in a commencement speech at the U.S. Naval Academy, Clinton announced a massive effort to protect the civilian population from biological weapons. Initiatives included public health and medical surveillance systems, training and equipping first responders, development of medicines and vaccines, and notably, preventing the nefarious use of biotechnology innovations.

In the days following 9/11, letters containing spores of Bacillus anthracis were disseminated through the U.S. postal system, resulting in the deaths of five people, and spreading fear and panic in an already fragile public and national security apparatus. Overseas for the CIA at the time, I remember receiving my mail from the United States; the yellowed, barely-legible, brittle envelopes were the result of irradiation as a precaution against additional attacks.

The threat from biological weapons seemed to be expanding, as the United States attempted to understand and deal with terrorist interest in biological weapons, along with nation-state programs—the former Soviet Union, China, Syria, Libya, Iran, North Korea, and Iraq, among others. Then in October 2002, the U.S. intelligence community produced a *National Intelligence Estimate* on Iraq's weapons of mass destruction (WMD) programs that stated unequivocally, "Baghdad has chemical and biological weapons." This certainty evaporated quickly.

Author Sonia Ben Ouagrham-Gormley deploys this history as backstory to her thought-provoking work on the challenges of accurately assessing the threat posed by biological weapons. She was able to incorporate into *Barriers to Bioweapons* interviews with several scientists from the Soviet and American biological weapons programs, her visits to former bioweapons facilities in the former Soviet Union, and her involvement in the DOD-sponsored Cooperative Threat Reduction Program—designed to reduce the proliferation threat posed by a crumbling post-Soviet WMD infrastructure.

The result is a persuasive analysis of the challenges involved with the development and dissemination of biological agents. She points out, for example, that the two largest programs, the Soviet Union and United States, were well financed and lasted many years, but they were never as successful as this investment warranted. She then compares the outcomes of these larger

programs to those of smaller (and much less successful), covert programs like the South African and Iraqi biological weapons programs, as well as that of the Japanese terrorist organization Aum Shinrikyo. Her analysis seeks to demonstrate that barriers of education and practical weaponization experience, along with organizational, managerial, and political issues, combined with economics, contribute to making the pursuit of biological weapons generally untenable, at least in the sense of a WMD meant to cause large numbers of fatalities vice mass fear and panic. In the last chapter of *Barriers*, and based on her research, the author provides several useful options for effective biological counterproliferation strategies and an updated paradigm for assessment of risk from these programs and technologies. Most compelling is her assertion that focus on acquisition and availability of biological weapons-related technology, restricting scientific publication, and concern with the emergence of new biotechnologies do not merit the interest so far afforded them in the U.S. national security approach.

In late November 2015, the *Los Angeles Times* reported that the Government Accountability Office was about to release a report indicating "the nation's main defense against biological terrorism—a $1 billion network of air samplers in cities across the country—cannot be counted on to detect an attack." Whether biological weapons pose a threat worthy of this level of investment is an important question. *Barriers to Bioweapons* should be in the library of those attempting to answer it.

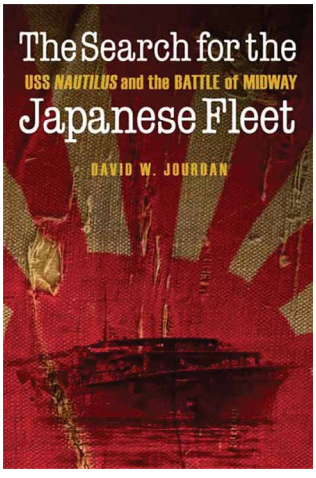
John G. Breen, PhD, Fort Leavenworth, Kansas

THE SEARCH FOR THE JAPANESE FLEET
USS Nautilus and the Battle of Midway

David W. Jourdan, Potomac Books, Lincoln, Nebraska, 2015, 424 pages

In T*he Search for the Japanese Fleet: USS Nautilus and the Battle of Midway*, David W. Jourdan writes on the pivotal Battle of Midway through a lens not previously used to view the battle by historians. The USS *Nautilus* (SS-168), commanded by Lt. Cmdr. William Brockman Jr. and manned by a ninety-three-person crew, was on her maiden voyage and tasked with locating the Japanese 1st Air Fleet, or *Kido Butai*, and then subsequently inflicting as much damage as possible on the enemy. Jourdan argues convincingly that *Nautilus*'s actions during the battle, and the initiative of her commander, assisted greatly in the destruction of *Kido Butai* and the overall thwarting of the planned Japanese invasion of Midway.

The intent of the book is to use the exploits and records of the USS *Nautilus* to create an untold story of the Battle of Midway. He then illustrates how these accounts were instrumental in assisting the author and his team with locating the sunken Japanese fleet.



Nautilus's mission log, Brockman's after action report, and interviews from crew members are used to assist the search efforts, and ultimately the team discovers the Japanese carrier *Kaga*.

Jourdan uses abundant sources throughout the book with a heavy emphasis on interviews and correspondence from historical subject-matter experts, participants of the battle, and U.S. Navy records and personal accounts. Referenced frequently by the author are *Shattered Sword* by Jon Parshall and Tony Tully, and *The Battle of Midway* by Richard Bates, and he states they were both invaluable in assisting him to write his book.

The book has many strengths, but one in particular is the author's ability to pack so much detailed information about the *Nautilus*'s maiden voyage and the Battle of Midway into such a small book. Other highlights include the description of how submarines were employed during World War II, the Japanese grand strategy for the campaign, and the counter actions of TF-16 (Task Force-16) and TF-17 during the battle. The mix of history and the underwater detective work required to find the Japanese fleet keeps the reader engaged from start to finish.

For readers already well versed in the Battle of Midway, the true value of this book is the author's account of modern-day underwater exploration and the sophisticated technology used to find the Japanese

fleet after decades of failed attempts. Jourdan's book does not provide any new details on the Battle of Midway other than the exploits of the USS *Nautilus*. Along with this book, the achievements of Jourdan and his team of deep-sea explorers are rewarded in the Discovery Channel documentary *The Search for the Japanese Fleet*. The film complements this book greatly to instill a greater understanding of USS *Nautilus*'s actions during the battle and the difficult task of locating *Kaga* after years of unsuccessful underwater exploration.

With the Battle of Midway arguably being the turning point in the Pacific during World War II, this book is worthwhile to service members and veterans interested in modern-day underwater exploration and search efforts. For individuals interested in the Battle of Midway, this book is valuable in understanding the interesting dynamic that American and Japanese submarines played in this pivotal battle.

Maj. Matthew Prescott, U.S. Army, Fort Leavenworth, Kansas

HIROHITO'S WAR
The Pacific War 1941–1945

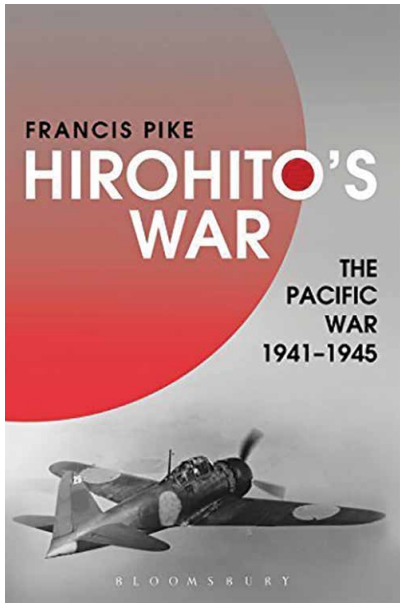
Francis Pike, Bloomsbury Publishing Company, New York, 2015, 1,184 pages

The Japanese Empire reached its peak by June 1942. In just ten years, Japan achieved a remarkable expansion of its empire from 243,500 square miles to 2.9 million square miles. Japanese forces achieved victories so stunning and in such rapid succession that planning did not go beyond March 1942. Despite its success, Japan was no closer to its initial objective of forcing the United States to a negotiated settlement that permitted Japan to keep its Great East Asia Co-Prosperity Sphere. Japan's defeat at Midway and the strategy that followed doomed the island nation to failure.

Historian Francis Pike, author of *Empires at War: A Short History of Modern Asia Since World War II*, provides the most comprehensive single volume account on the Pacific War to date in *Hirohito's War: The Pacific War 1941–1945*. Pike offers a fresh interpretation of the conflict and balances the Western-centric view with attention to the Japanese perspective. Pike challenges widely held perceptions of historians and scholars concerning the Pacific War.

For example, Pike challenges a widely held belief that Secretary of State Cordell Hull's ten-point ultimatum delivered to Japanese Ambassador Nomura on 26 November 1941 gave Japan no other choice but war with the United States. Pike counters that this ignores the simple fact that Japan was already deploying forces to attack the Philippines, Malaya, and Pearl Harbor when the ultimatum was delivered.

Among Pike's many significant observations and reflections, two stand out. First, Pike challenges the long-held belief by many historians that Hirohito was simply a constitutional monarch forced into war by his generals. Pike asserts that Hirohito demonstrated his absolute powers on three separate occasions: he forced the resignation of the prime minister in 1929, he overruled his military advisors to insist on the harshest treatment of officers involved in an attempted coup in 1936, and he overruled his advisors by insisting on a Japanese surrender in 1945.



Second, the Imperial Japanese Navy's plans for war with the United States were predicated on a Japanese invasion and defeat of American forces in the Philippines. It was assumed that the U.S. Navy would then steam across the Pacific Ocean to relieve or retake the Philippines. Japanese submarines armed with modern torpedoes would attrite the U.S. Navy by 30 percent by the time it arrived at the Marshall Islands. The Japanese Navy would then destroy the American Navy in a repeat of the destruction of the Russian fleet at Tsushima. Destruction of the American fleet would

result in America's acceptance of Japan's Great East Asia Co-Prosperity Sphere.

Hirohito's War suffers from the lack of maps or illustrations in the book. Maps and illustrations are referred to throughout the book, but the readers can only access these on Pike's website. Readers may also find Pike's prose, in addition to 1,184 pages of reading, a challenge.

In summary, Pike provides a detailed and highly useful narrative of the Pacific War. *Hirohito's War* is strongly recommended, despite its length and lack of maps or illustrations, for the balanced view it presents. It is a great addition to any World War II collection.

Jesse McIntyre III, Fort Leavenworth, Kansas

TO HELL AND BACK
Europe 1914–1949

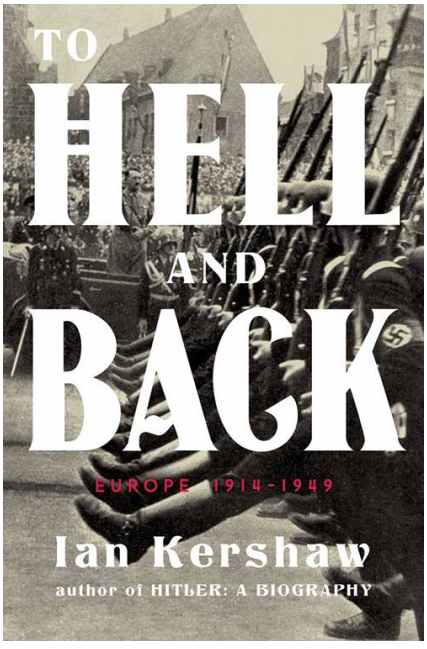
Ian Kershaw, Viking, New York, 2015, 624 pages

Eminent British historian Sir Ian Kershaw lends his considerable skills to *To Hell and Back: Europe 1914–1949*, the eighth installment of *The Penguin History of Europe*, which spans the classical period up to modern day. (The author will also write the ninth and final volume in the series, covering 1950 to the present.) Kershaw, perhaps best known for his masterful biography of Adolf Hitler as well as his chronicles of the Third Reich, is eminently qualified to pen this history.

Kershaw admits that *To Hell and Back* is "by some distance the hardest book" he has ever written, and that, except for some primary research on the interwar period, he uses mainly secondary sources in to compose his history of Europe during the turbulent first half of the twentieth century. Readers need not worry—there is much to learn from Kershaw's impressive ability to distill and explain the complex social and political trends that form the crux of the book.

Europe was at war for ten of the thirty-five years spanned in Kershaw's work. However, the author reminds us that for much of the remaining period, Europe was anything but at peace, and was wracked by constant turmoil, chaos, and death. *To Hell and Back* effectively and equally conveys the horrors of both world wars as well as their aftermaths—whether the political turmoil and economic chaos of post-Versailles and post-depression Europe, or the utter destruction and social disorientation affecting the continent following World War II.

This is neither a combat history of the world wars nor a detailed examination of the interwar period, but Kershaw covers more than enough to provide context. His main approach is identifying the social and political forces that shaped both wars, the interwar period, and the onset of the Cold War. Chief among these seminal factors are nationalism rooted in race and ethnicity, revisionist demands for lost territory, a heightened sense of class conflict, and a breakdown in the efficacy of capitalism.



How these forces affected the entirety of Europe—not just Western Europe as one might expect based on the author's expertise—is perhaps *To Hell and Back's* greatest strength. Kershaw seamlessly integrates a state-by-state analysis into his narrative, never making the reader feel that the book is simply an accumulation of individual national histories. His coverage of central, southern, and eastern Europe is particularly instructive, especially for readers accustomed to a western perspective. Kershaw always seems on the mark, whether covering the destructive ethnic conflicts that continuously ravaged Eastern Europe, or explaining why fascism took such a firm hold in Italy and Germany during the interwar period.

To *Hell and Back* is certainly a worthy entry to the Penguin European history anthology, and it stands alone as a solid, well-researched, and eminently readable work. Kershaw's work makes a memorable contribution to our understanding of the forces and trends that continue to shape modern-day Europe. It is highly recommended to students of both world wars, the interwar period, and

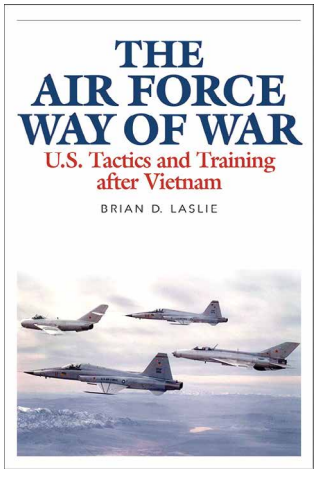
modern European history. His next entry to the Penguin series, *Fractured Continent: Europe 1950—The Present,* is eagerly anticipated.

Mark Montesclaros, Fort Gordon, Georgia

THE ASHGATE RESEARCH COMPANION TO THE KOREAN WAR

Donald W. Boose, Edited by James I. Matray, Ashgate Publishing Company, Burlington, Vermont, 2014, 494 pages

"The wrong war, at the wrong place, at the wrong time, and with the wrong enemy," said Chairman of the Joint Chiefs of Staff Gen. Omar Bradley, often misquoted as in reference to the Korean War. He was in fact talking about the possible expansion of the Korean War into China, as was advocated by Gen. Douglas MacArthur before being fired by President Harry Truman. Mistakes such as this are common concerning the Korean War, a war often called "the forgotten war." That the war is forgotten is as much a consequence of circumstance as it is of a national narrow attention span, what with the concept of the heroic war of World War II and the tragic mistake of Vietnam. The Korean War was short, brutal, and bloody, and *The Ashgate Research Companion to the Korean War* relates a thorough history of the conflict.



To begin with, it is important to clarify what this book is not—it is not a normal history book, or even a simple backgrounder for the Korean War. For the price, nearly $200, it is not marketed for the mass market. Simply put, the book is an organized academic backgrounder for the war. The text is organized into three parts, with each bringing to light an aspect of the war, with further chapters by academics who tackle specific sections of the theme. The book's organization makes it extremely easy for any reader to focus on a specific perspective of the war in the first section, which covers the politics and background of the various actors.

Next, the book tackles what we in the U.S. armed forces understand as capacities and capabilities. In the section titled "Tactics, Equipment, and Logistics," a number of experts detail aspects of the war that generally became a line or a paragraph in a general history, or even a specialized book that gets put in that pile we mean to read "some day." With chapters such as "Naval Operations" by historian Edward Marolda, formerly of the Naval History and Heritage Command, or "Republic of Korea Army" by Il-Song Park, head of the Military History Department at the Korean Military Academy, it is clear the editors found some top talent to contribute.

The final section addresses the flow of the fight, with multiple chapters covering the highlights in depth. Readers looking for a general history of the Korean War will most likely find this book too detailed. However, anyone seeking to understand the Korean War in depth without having to invest the time to find and read twenty individual books, or those looking to write academically on the Korean War, will consider this book worth its weight in gold.

Maj. Jonathan Freeman, U.S. Army Reserve, London

THE AIR FORCE WAY OF WAR U.S. Tactics and Training after Vietnam

Brian Laslie, University Press of Kentucky, Lexington, Kentucky, 2015, 260 pages

The U.S. Air Force in recent decades has created a new conversation about the role of airpower in conflict, after dominating performances in Operations Desert Storm and Allied Force. Historian Brian Laslie has thoroughly analyzed recent air operations and produced a thought-provoking treatise on the importance of a post-Vietnam training renaissance leading to U.S. success after Vietnam. Beginning in the 1970s, the U.S. Air Force's Tactical Air Command (TAC) and an innovative team of young officers began

a military revolution by creating new exercises with extraordinary realism outside combat. Laslie carefully builds the case that Red Flag and other major training events increasingly gave TAC fighter units unique advantages over their adversaries. He cautions that today even our allies are no longer able to keep pace with these American airpower capabilities. Joint officers that want to understand the true strength of our air operations should study *The Air Force Way of War.*

Laslie is candid about the shortcomings of the Air Force during the Vietnam War, such as "poor organization, weak command and control, and lack of unity of command." Soviet-era anti-aircraft technology was very capable of downing tactical U.S. aircraft in alarming numbers. Soviet aircraft with higher maneuverability were many ways technologically equal with U.S. peers. Tactical pilots were stretched with many different missions and a limited proficiency in any of them, especially in basic fighter maneuvering concepts. This resulted in part because the needs of the bombers of the Strategic Air Command (SAC) in the 1950s and 1960s had been given a higher priority than TAC.

After Vietnam, Richard "Moody" Suter, a major on the Air Staff, developed a new concept of progressively more difficult training against Soviet-style aggressors in a mature environment. New command structures were stressed with a single air component command controlling the fight. New aircraft, such as the F-16, A-10, and the low observable F-117, were given realistic scenarios to increase their survival during the first ten missions. In addition, a young John Jumper from the Fighter Weapons School advocated new tactics, training, and evaluation. Pilots practiced the destruction of integrated air defense systems followed by deep attack. The skills thus developed would be validated against the Libyans during the benchmark 1986 El Dorado Canyon Operation.

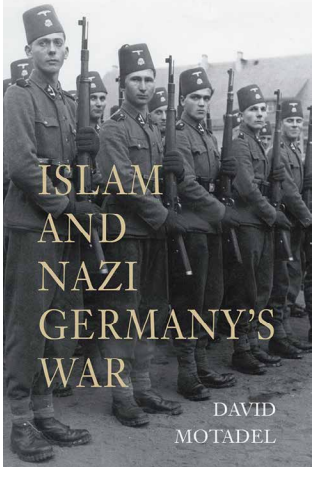
Other airpower theorists of this era, such as John Boyd and John Warden, provided important contributions as air campaigns were developed. Laslie makes the case that by the 1990s, the terms "tactical" and "strategic" were no longer useful in describing airpower. Warden and the Checkmate cell's "Instant Thunder" brought tactical aviation to the forefront against Iraq in a strategic role. Therefore, the targeting emphasis shifted away from fielded forces since the ground forces were not considered the critical center of gravity. The success of these modern master air attack plans ultimately exposed SAC as having "the wrong equipment, the wrong mentality, and the wrong grasp of aerial warfare." TAC and SAC subsequently consolidated into a more sensible Air Combat Command. Can the Air Force now adjust and develop better strategies to fully use the capabilities of remotely piloted aircraft?

James Cricks, Fort Leavenworth, Kansas

ISLAM AND NAZI GERMANY'S WAR

David Motadel, Harvard University Press, Cambridge, Massachusetts, 2014, 512 pages

Islam and Nazi Germany's War is a well-written survey of Nazi attempts to compensate for military manpower shortages in World War II by seeking to mobilize support among Muslims from North Africa to Eurasia. In bringing order to this complex enterprise, the author wrestles effectively with some of the exquisite paradoxes of Nazi thinking. After all, how was it that the leaders of a regime whose founding doctrine stressed extreme racial and cultural intolerance could seek support from populations that did not neatly fit Aryan stereotypes? Even though the Nazis focused their recruitment on lighter skinned populations of the former Ottoman Empire, the North Caucasus, and fringes of Central Asia, the convoluted logic of the quest was inescapable.



Author David Motadel's nuanced analysis reveals the efforts of Nazi policymakers to market their cause to populations with which they had little historical connection. Of course, some Nazi ideologists had noted in passing before the war that the Islamic world shared a list of enemies—from Jews to British imperialists to Slavs—with the Third Reich. With this in mind, strategic communications in the Arab world

focused on setting Germany apart as a willing friend and potential ally. In response, men such as Amin al-Husayni, the mufti of Jerusalem, took up the cause by 1940 and emerged as a key adviser to the Nazi hierarchy. Aggressive courtship of Muslim partners, however, really began in 1942 as it became clear that German victory was not at hand and indeed might never come.

An initial problem entailed the mere act of communicating interest in a common front to potential Muslim allies. Relatively few Muslims in most of the war zones were literate, and fewer still possessed radios. Recruiting Muslims from among Soviet prisoners of war sometimes proved simpler. In the meantime, the Nazis confronted a huge problem of their own making in trying to sell Germans—steeped in years of racist indoctrination—on the virtues of their proposed allies. The *Schutzstaffel* (SS) units in particular had to learn to work alongside Muslim units of their own creation. For the most part, German officials followed in the wake of the Wehrmacht and spread an invitation to join the cause to any Muslims who would listen. Much of their argument centered on "shared values" between Nazis and Muslims. They even sponsored friendly Muslim hierarchies and institutions to demonstrate their benevolent concern for the *ulema* (mullahs). The message resonated best in places where predominantly Turkic Muslims, subjugated by Slavic populations, lived as minorities in lands they once owned. In turn, some Muslims perceived this as an opportunity to align their fates with that of an apparently victorious power.

To be sure, the Nazi recruitment campaign was not wildly successful, although it did yield a few divisions of soldiers in the Balkans and the Caucasus. Of course, a good many Muslims served in armies fighting the Nazis as well, a fact that was sometimes lost in the aftermath. Indeed, it is also noteworthy that Nazi attempts to instigate unrest behind allied lines had little effect. Nevertheless, in the end, associating themselves with the Nazi cause often had serious postwar consequences for Muslim minorities. To their later regret, Muslims in Yugoslavia aligned themselves with Croatian fascists of the Ustasha. Serb memories of the terror they were subjected to helped fuel Bosnian Serb aggression during the Yugoslav Civil War of the 1990s. Meanwhile, within the borders of the Soviet Union, significant, but not large, numbers of Chechens, Ingushis, and Crimean Tatars, among others, joined the invaders. Once the Red Army regained control of the Crimea and North Caucasus in 1943–1944, Joseph Stalin directed the wholesale deportation of entire populations to Siberia and Central Asia. Many perished during the removal process while those who arrived in their assigned places of exile typically found they were less than welcome. Ultimately, return to their ancestral homes became possible for some under Nikita Khrushchev in the 1950s, while others had to wait until the Gorbachev era at the close of the Cold War.

In summation, Motadel's study includes much original research and pulls together in a coherent narrative the separate experiences of a variety of Muslim populations. The work is highly readable and provides fresh coverage of a seldom-addressed aspect of the war. Overall, the book draws upon a broad range of sources, including many documents from the German archives, and is a valuable contribution to scholarship on the war. For students and scholars alike, it serves as useful background for understanding many developments of the post-Cold War period across the Middle East, the Balkans, and western Eurasia.

Dr. Robert F. Baumann,
Fort Leavenworth, Kansas

THE GREAT DIVIDE
The Conflict Between Washington and Jefferson That Defined a Nation

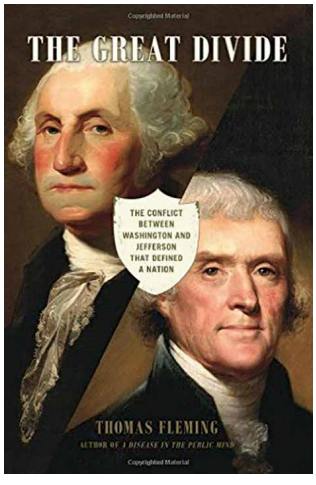
Thomas Fleming, Da Capo Press, Cambridge, Massachusetts, 2015, 410 pages

Idealistic, naïve, and hypocritical are among the gentler terms used by well-regarded and prolific historian Thomas Fleming to describe the third president of the United States. When compared to the leadership, judgment, and political skills of George Washington, the contrast is stark. The portrait painted of Thomas Jefferson is not a flattering one. While the book is framed as the dichotomy between Washington and Jefferson, it is no surprise that a primary connection between the two is James Madison.

The establishment of the National Bank was the turning point in the relationship between Jefferson, Madison, and Washington. Treasury Secretary Alexander Hamilton convinced the president that

the bank was not only necessary but also constitutional, after receiving strident arguments to the contrary from Jefferson. His signing of the bill led Jefferson and Madison to believe he was under the control of Hamilton. Fleming demonstrates this perception was incorrect, showing there was a nearly even split in the disputed decisions of the administration, half favoring Jefferson. The author also takes issue with historians believing Washington did not intend to be an activist president.

Jefferson had an almost religious fervor and faith in liberty, a utopian perception of it. He believed the bank would inherently favor the rich and further the formation of an aristocratic class. His view toward liberty was also the driving force behind his blind support of the French Revolution, which caused the final split between Jefferson and Washington.



Fleming paints Washington's forbearance of the cabinet warfare, played out in the newspapers and vicious personal criticism, as evidence of his leadership and political skills. Washington had excellent sources and information on the actions of Jefferson and Madison. His interest in considering all sides of questions and receiving unvarnished advice led Washington to request both Jefferson and Hamilton extend their tenures in office. Washington also kept the opposition leader, Jefferson, close by and demonstrated neutrality—a smart political move, Fleming argues.

In contrast, Fleming has a less favorable view of Jefferson's terms as president, unsurprisingly. Jefferson's lack of military knowledge led to his insistence on building a small and poorly equipped class of naval gunboat of his own design, insufficient for the challenges faced. The Louisiana Purchase is portrayed as virtually pure luck from which Jefferson benefitted, an act that ensured his easy reelection. While he knew the Constitution and pledged his strict adherence to it, he was silent on Constitutional matters. Moreover, he acquiesced to the "implied powers" utilized by predecessors he had been so critical of previously, further demonstrating his hypocrisy. Jefferson's action or inaction set the table for the War of 1812, and Fleming argues his writing on nullification at other times in his career sowed seeds which at least in part came to fruition by the time of the Civil War.

Washington, while too tolerant of the dissension in his cabinet, is portrayed as a leader and model to which every president should aspire. In comparison, the nearly unceasing criticism of Jefferson is softened only by Fleming's acknowledgment that "Jefferson's gift for inspiring words should persuade the readers … to summon forgiveness and rueful—or better sympathetic—admiration for this deeply conflicted man."

Fleming's contentions throughout this fine scholarly work are clear and well supported. This would be an excellent addition to the library of any historian or officer with an interest in the founders.

Gary R. Ryman, Scott Township, Pennsylvania

COWARDICE
A Brief History

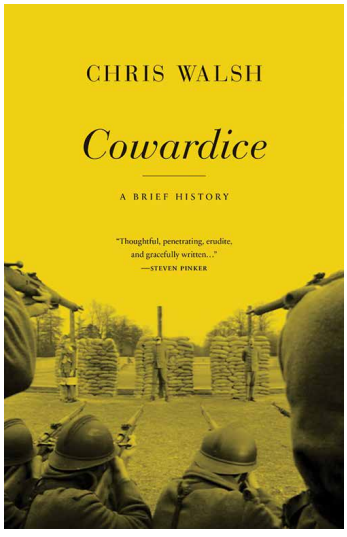
Chris Walsh, Princeton University Press, Princeton, New Jersey, 2014, 304 pages

On 10 August 1943, Lt. Gen. George S. Patton met Pvt. Paul G. Bennett while visiting soldiers in an evacuation hospital in Sicily. When Patton inquired about Bennett's injury, the young soldier replied, "It's my nerves." Patton grew angry and yelled, "Your nerves? Hell, you're just a goddamned coward you yellow son of a bitch." He then slapped the soldier twice while shouting, "I ought to shoot you myself right now." This now infamous scene not only earned Patton a rebuke from Gen. Dwight Eisenhower but it also brought to light Patton's anachronistic view of cowardice. The media response and public outcry that followed signaled a shift in societal understanding of this complicated emotion and begged the question: What exactly do we mean by cowardice?

In *Cowardice: A Brief History*, Chris Walsh attempts to answer this question and many others surrounding the taboo word. Early in his book, Walsh defines a coward as "someone who, because of excessive fear, fails

to do what he is supposed to do." From there, he sets out to prove that cowardice is dangerous in its ability to cause inaction or drive recklessness, and useful as a tool for self-examination and development. He does this through a survey of the societal concepts of cowardice throughout American history.

Walsh marks the transformation of America's view of cowardice through its wars. From the American Revolution to the War on Terror, Walsh traces the use of the word. He argues that the Civil War marked a shift in the previously pejorative understanding of the word, and it also ushered in the medicalization of cowardly behavior. What was once considered cowardly was medically excused during the Civil War as "nostalgia" and "soldier's heart." In later wars, it became "shell shock" and posttraumatic stress disorder. As evident through these changes, Walsh argues, society's attitude toward cowardice has softened over time.



Walsh's survey of cowardice includes books such as Joseph Heller's *Catch-22*, films such as Stanley Kubrick's *Paths of Glory*, and philosophers from Confucius to Søren Kierkegaard. Though this vastness signals a thoroughness in Walsh's research, it also contributes to one of the book's shortcomings: its dizzying array of sources. For example, in one paragraph Walsh takes his readers from eighteenth century sermons to 1960s fiction to Iraq War examples of cowardice. The genre of sources throughout the book includes literature, psychology, anthropology, sociology, physiology, philosophy, and even neuroscience, among others. The book's epigraph alone quotes George Washington, Mahatma Gandhi, Samuel Johnson, and Dante Alighieri. Nevertheless, the varied nature of the myriad sources is made more palatable through Walsh's eloquent prose and graceful style.

Of the numerous sources that Walsh calls upon in his "brief history," almost all are primary accounts or examples. This may be due in part to the paucity of studies on the subject of cowardice. In fact, in the Library of Congress, Walsh's book is the only entry cataloged under "Cowardice—history." Walsh himself claims that his is the only substantial scholarly consideration of the subject. Yet, his study seems incomplete in that it examines cowardice through primarily an American military lens. Though he excuses this omission in the name of brevity, it seems that examining cowardice through various cultures might prove useful in achieving what his book sets out to do.

Nevertheless, Walsh's well-written study of cowardice and thoughtful consideration of its evolution is clear on every page. Even the book's yellow cover serves as a reminder of the pervasive nature of the taboo subject throughout our everyday culture. Furthermore, it unveils interesting questions about cowardice in today's wars and society. The book is an erudite and thought-provoking study that will prove invaluable for anyone wishing to better understand cowardice, its role in war, or society's view of it.

Maj. Paul de León, U.S. Army,
Fort Leavenworth, Kansas

WATERLOO
The Aftermath
Paul O'Keeffe, The Overlook Press, New York, New York, 2015, 400 pages

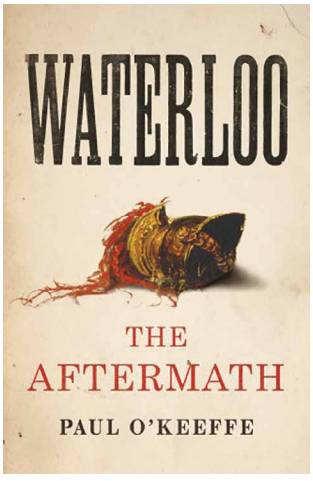
Paul O'Keeffe's *Waterloo: The Aftermath* is eminently readable narrative history, and an ideal companion to further study the end of Napoleon's empire. The author, an accomplished writer and historian who earned his PhD from the University of Liverpool, draws extensively on contemporary sources, connecting the immediate aftereffects of the battle to the courses of events that led to the ultimate end of Napoleon's era.

True to its title, the book's focus is not the actions on the field but the consequences of the battle and events up until the time of Napoleon's exile a few frantic weeks later. In the opening pages of the book, the author describes the battle from its periphery. The reader experiences the cannon fire, the ground trembling from artillery more than fifty miles away, the confusion of the initial reports,

and the sight of casualties as they stream away from the field. This style continues throughout the book, immersing the reader into the events as they happen.

The author's goal is not to offer a new theory on the already well-studied battle but rather to provide a visceral experience that is often missing in history books. His execution is superb. Twenty-two pages of notes and eleven pages of a bibliography are woven together with a narrative talent to bring the events to life. The author makes extensive use of archived letters, newspapers, and other firsthand accounts in the book. Covered in detail are engrossing descriptions of the catastrophe on the field of battle, the spreading of the news in England, and the frantic retreat of the French army.

In a book full of excellent chapters, the last full chapter, dealing with Napoleon himself, is perhaps the best. The reader experiences his flight from the field, and his desperate withdrawal to Paris. Gone is the confident emperor that terrorized Europe, and in his place is a man who seems to realize that the end is near. As he returns to Paris, instead of listening to his advisors and proceeding directly to the Chamber of Representatives to plea for their support, he draws a bath and rests. Having lost the initiative, he shortly abdicates the throne thereafter in favor of his son. Plans are made to escape to America, but the English cannot allow it, and he instead ends up on a British warship on patrol in the English Channel. Despite his pleas for shelter in the English countryside, the British government knows that such a move is untenable and relegates him to his final exile on the island of St. Helena. Although the end of the story is known from the first word, the reader cannot help but see all the chances for a different course, and a different Europe.



Analysis of history is often undermined by hindsight; readers know what happens in the end so the end therefore seems inevitable. O'Keeffe manages to bring the reader closer to the original experience through the use of contemporary sources. He excels in showing the tiny crossroads where history could have been dramatically different. His combination of scholarly and firsthand sources is excellent, creating narrative history at its best. *Waterloo: The Aftermath* is highly recommended as an accompaniment to further study of Napoleon and the end of the French Empire. However, one can still enjoy the book with even a casual understanding of the battle and its consequences.

Maj. Brian A. Devlin, U.S. Army,
Stuttgart, Germany

BOSWORTH 1485
The Battle that Transformed England

Michael K. Jones, Pegasus Books,
New York and London, 2015, 256 pages

Regardless of who created the aphorism "history is written by the victor," nothing could be closer to the truth than in the case of King Richard III, the last Plantagenet king of England. Richard's grave, discovered under a parking lot in Leicester, England, in 2012, helped rekindle an investigation by some historians as to what kind of king he was. His defeat at the Battle of Bosworth in 1485 ended an almost five hundred-year Plantagenet reign and allowed for future writers, such as William Shakespeare, to portray him in a light that might not have been grounded totally in truth. Author Dr. Michael Jones first challenges the credibility of those portrayals by reexamining primary sources of the time and coupling this research with evidence gathered from the burial site of the king. A second discussion, not as powerful as the first, argues about where the battle really took place.

Jones argues early in his text that many of the authors who wrote about Richard III were doing nothing more than attempting to paint the victor and survivor of the battle, Henry VII, in a positive light. Those portrayals, and what ultimately has become accepted history, ignore the need to be objective rather than subjective in their nature. As a result, we have been left with a history of Richard III that was written to make him look more like a maleficent monster than a monarch—a king willing to sink to any level to maintain his throne against a worthier contender.

Does this necessarily mean that Richard III was the quintessence of evil? Jones's evidence points to his demeanor being somewhere in between. He makes the case that Richard III did possibly commit some horrendous acts, such as murdering Edward IV's (his brother's) two sons. Jones also points out that Richard did commit some heroic acts, such as his doomed charge against Henry VII's ranks at the Battle of Bosworth. The objective nature with which Jones approaches his research is commendable. The reader is never forced to see things Jones' way when reading his text. He simply states his researched discoveries and allows the readers to make their decision.

As mentioned before, Jones's book also discusses where the Battle of Bosworth occurred. This discussion does not necessarily add to his initial argument, but it could rather be the subject of another publication. The lasting effects of the battle itself are what really matters in this book. It represents the end of one chapter of the history of the British people and the beginning of another.

In terms of the quality of study by historians, this text is extraordinarily valuable. Its objective nature and fresh look on a subject a few centuries old create an informative and enlightening read.

Right from the start, Jones makes the claim that his book is intended for a general audience. It is not over-burdened with in-text sources, which allows for a very easy and informative read. For someone interested in a pivotal moment in British history, I would highly recommend *Bosworth 1485: The Battle that Transformed England*.

1st Lt. Eugene M. Harding,
U.S. Army National Guard, Auburn, Indiana

SPAIN
The Centre of the World, 1519–1682
Robert Goodwin, Bloomsbury Press, New York, 2015, 608 pages

Robert Goodwin presents the reader with an intimate portrait of Spain during its Golden Age in which he more or less successfully weaves the separate strands of music, art, military affairs, politics, economics, and religion together and shows us the relationships among them. Spain is presented as a cosmopolitan Renaissance state with Castilian overtones. Goodwin gives us a world in which the modern nation-state is struggling to be born, high politics resembles a series of family feuds, feudal and aristocratic mores struggle for social dominion with a bourgeois set of values, and religion has a paramount role in society.

The narrative is divided into two parts: "Gold" and "Glitter." "Gold" shows how the Spanish monarchs built on their Habsburg and Aragonese inheritances to fashion a globe-girdling empire—from the Mediterranean basin and northern Europe to the Caribbean basin and from the Americas to Africa and Asia. Goodwin details the ways the representatives of Charles V and Philip II conquered, administered, and exploited the resources of this empire, as well as defended Catholic orthodoxy in the face of Protestantism as Holy Roman emperors. "Glitter" shows Spain in relative decline, with both Philip III and Philip IV drawn into endless wars with the Netherlands and their allies; Spanish society is contrasted with the expansive Dutch, French, and English societies. These rising powers supplanted Spain and the Habsburgs in Europe, but in its relative decline, Spain created a Golden Age of art and literature while remaining a Great Power with an extensive colonial empire.

Goodwin depicts Spanish monarchs and their courts as sophisticated patrons of the arts as well as capable military men who understood how to wage war despite the handicaps concerning public finance imposed by a divided medieval state structure. All those attributes intertwine with devotion to religion that most of us today do not understand.

The study of Spanish history and the Spanish Empire in the Americas is neglected in our educational system. If studied at all, Spanish history is a precursor to the English and French colonization of the Americas. The study of Spanish history remains heavily influenced by the Black Legend of Spain, assiduously propagated by those who emphasized the villainy of Catholic Spain, supposedly exemplified by the Inquisition and the merciless conquest of the indigenous high civilizations of the Americas. Goodwin exposes the falsity of this portrait.

The Spanish Empire existed from the early sixteenth century until the early nineteenth century. Its final remnants were liquidated only in 1898. In Central and South America, it created dependencies that matured

into successful independent states. Wars in the region are rare, in contrast with other parts of the world.

Goodwin leaves us pondering whether Spain truly declined because in many ways it did not. In the seventeenth and eighteenth centuries, Spain and its empire were peaceful, stable, and relatively prosperous, and its colonial society more civilized than the contemporary British colonies in North America. Perhaps it did not really decline but suffered under the perception of decline. Perhaps we should be asking more questions about this portion of the past.

Lewis Bernstein, PhD, Woodbridge, Virginia

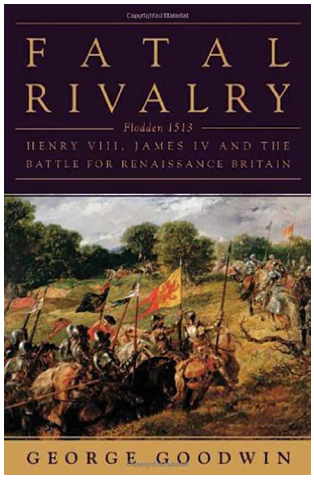
FATAL RIVALRY
Flodden, 1513: Henry VIII, James IV and the Battle for Renaissance Britain

George Goodwin, W.W. Norton & Company, New York, 2013, 320 pages

The Battle of Flodden is the next strategic-level event to mark a functional shift in the balance of power in England in the sixteenth century, following the Battle of Towton in 1461. The latter was one of the bloodiest engagements in English history and a landmark event that changed the fortunes of kings and lords alike. In the Battle of Towton, however, the primary leadership in both camps were English. This review of the successor engagement of Flodden makes the transition to one of international significance and open conflict between opposing nations, with an effect felt across the channel into mainland Europe. As a reviewer for George Goodwin's *Fatal Colours*, I would be remiss not to highlight this salient point and true paradigm shift. The outcome of this engagement decided whether Scotland would be more of a vassal state or an independent and autonomous kingdom.

Fatal Rivalry provides the reader with a view of gamesmanship of kings and lords during times of societal upheaval, changes in allegiances (marital or otherwise), and military industriousness. The Battle of Flodden, for which the author painstakingly leads the reader up to the climactic end point, addresses several of these ideas. Setting the stage is critical to understanding the notable differences as well as the similarities in combatants. The Scottish king, James IV, was well spoken and well respected, and he had leveraged all his diplomatic skills in uniting a fractured and often disassociated nation. He was akin to Henry the VII, king of England, in the preceding years and competed with him on more of a Renaissance stage then a militaristic one. However, as the sun set on Henry the VII, and his son, Henry the VIII took the thrown, a different position dominated the political landscape. Antagonism and liberal exercise of authority, primary in the English camp, led to the eventual escalation of hostilities with James IV.

The Scots crossed the border with over forty thousand men, the largest army ever assembled at the time, and with the most advanced siege craft. They captured English strongpoints in days and laid the foundation for their future use. Additionally, the Scots used pikemen tactics taken from the Swiss, utilizing these as well as their scouts and locals all along the borderlands for information and operational security. This army faced a much more traditional force of English that numbered around thirty-two thousand. It was divided into two echelons to meet its objectives on the battlefield, primarily attempting to secure the high ground. Whether a ruse or crafty stratagem, the Scottish king was enticed out of an excellent defensive position and forced to occupy another, or so he believed. This undid his advantage in siege craft and cannon—which could not easily be reset and aimed—accounting for their minimal use in the engagement that followed. Using pikemen was a good concept; however, in execution, the Scots did a poor job of reading the terrain, understanding the need for inertia in this type of weapon, and were bogged down in a muddy marsh, rendering their weapons and tactics moot.



The earl of Surrey and his counterpart lords on the English side took advantage of the situation. Although outnumbered and lacking in provisions and supplies, they used their bowmen and bladed forces to good effect, to include their killing the king and thousands of Scottish soldiers. As the armies melted away at the conclusion, the whole of the continent, as well as mainland

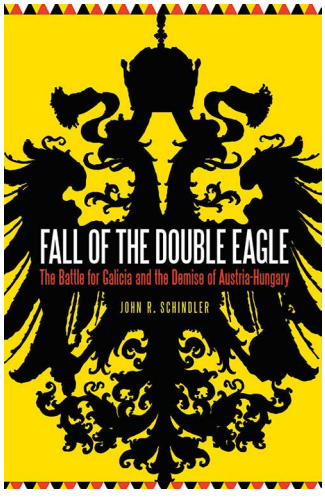
Europe, were forced to recognize the state of affairs as favorable to the English. Aside from skirmishes over the next centuries, for all practical purposes, this was the conclusion of large-scale Scottish invasions, and within two hundred years, Scotland became an official part of Great Britain.

Col. Thomas S. Bundt, PhD, U.S. Army,
Fort Detrick, Maryland

FALL OF THE DOUBLE EAGLE
The Battle for Galicia and the Demise of Austria-Hungary

John R. Schindler, Potomac Books, Lincoln, Nebraska, 2015, 360 pages

The recent World War I centennial has resulted in a flood of new histories. Though most of this scholarship has focused on the Western Front, several new works have brought a new focus to the Eastern Front and the Austro-Hungarian Empire. Published in just the last two years, Geoffrey Wawro's *A Mad Catastrophe*, David Stone's *The Russian Army in the Great War*, Laurence Cole's *Military Culture and Popular Patriotism in Late Imperial Austria*, and Richard Bassett's *For God and Kaiser* represent a welcome renaissance of Austro-Hungarian military history. John Schindler's *Fall of the Double Eagle* is a worthy addition to the field—a fascinating history of a battle that gutted the Austro-Hungarian army in under three weeks and sealed the fate of the Habsburg dynasty.



Context is essential to understand the bewilderingly complicated Austro-Hungarian Empire, and Schindler does an excellent job of introducing the multinational state and army, and the lead-up to war. Such context is essential to understand 1914 since virtually everything in Austria-Hungary's armament, training, tactics, and strategy was flawed throughout the war. Schindler devotes several chapters to the problems Austria-Hungary had with funding and training its army—the main problem being the cumbersome and complicated political arrangement of Austria-Hungary. This allowed intractable Hungarian politicians to make it very difficult to increase the military budget. Lower budgets meant fewer troops with shorter enlistments, a poorly trained reserve, and insufficient and outdated artillery. By the time the Austrians went to battle in Galicia—today's southern Poland and western Ukraine—they were already fighting with a severe material disadvantage against the Russian army.

The central figure in *The Fall of the Double Eagle* is Conrad von Hötzendorf, chief of staff of the Austro-Hungarian army from 1908 until 1917. His tactical doctrines, strategic concerns, training policies, and budgetary priorities defined the army by World War I. Unfortunately, even by the standards of his time, von Hötzendorf failed to understand the realities of the modern battlefield, and was obsessed with infantry attacks as a panacea for tactical and strategic problems. Schindler does an excellent job of tracing how von Hötzendorf's botched initial deployment (he mistakenly sent an army to the Balkans, reversing his decision in time to ensure that two corps were unavailable to fight against either Serbia or Russia), cascaded into suicidal bayonet attacks against superior Russian artillery. When Austrian infantry fought Russian infantry on equal terms, they usually proved victorious, but the institutional failings of commanders ensured that Austro-Hungarian soldiers rarely fought on equal terms. Overall, the Austro-Hungarian army lost over four hundred thousand soldiers in three weeks—around half of all forces committed to the Eastern Front.

Schindler correctly emphasizes that one of the best-known elements of the Austro-Hungarian army—its multinational makeup—was not a fatal flaw in 1914. Austrian officers feared that Austria's Slavic soldiers were disloyal and unreliable. This was simply untrue in 1914. Moreover, heavy casualties, poor leadership, and tactical blunders can easily explain the instances of Slavic units later cracking under the strains of war. In general, all units in Austria-Hungary's army followed deeply flawed

tactical doctrine bravely and enthusiastically, until rendered ineffective by loss of men and officers. Poor treatment of Slavic units—particularly Czechs—by the army would eventually create disloyalty later in the war, but this was a creation of the army itself, not inherent to the troops.

One of Schindler's most interesting contributions is his emphasis on Austria's one real success: signals intelligence. Capt. Hermann Pokorny, a skilled linguist and mathematician, pioneered the use of radio intercepts and code breaking, giving von Hötzendorf's generals' real-time signals intelligence. Though often ignored by von Hötzendorf, Pokorny's work saved countless lives during the general retreat back to Krakow in September 1914.

All in all, *The Fall of the Double Eagle* is an excellent examination of one of the most important battles of World War I, which would shape the future of the Eastern Front and destroy the prewar Austro-Hungarian army. Highly recommended.

John E. Fahey, Purdue University

SPRING 1865
The Closing Campaigns of the Civil War

Perry D. Jamieson, University of Nebraska Press, Lincoln, Nebraska, 2015, 320 pages

Approximately sixty thousand books have been written about the American Civil War, so it is often difficult for authors to introduce new material, insight, and analysis to the historiography. Perry Jamieson's *Spring 1865: The Closing Campaigns of the Civil War*, however, does not aim to break new ground. As a part of the "Great Campaigns of the Civil War" series, Jamieson, the senior historian emeritus of the U.S. Air Force, instead "offers readers concise syntheses of the major campaigns of the war, reflecting the findings of recent scholarship … [and] points to new ways of viewing military campaigns by looking beyond the battlefield and the headquarters tent to the wider political and social context within which these campaigns unfolded." In other words, Jamieson uses a variety of contemporary secondary sources, instead of original primary source research, to synthesize a concise and readable history of the closing campaigns of the Civil War that is valuable to a wide variety of audiences.

Spring 1865 juxtaposes Maj. Gen. William T. Sherman's march north through the Carolinas, which ended in Gen. Joseph E. Johnston's surrender at Bennett Place, with Lt. Gen. Ulysses S. Grant's chase of Gen. Robert E. Lee and the Army of Northern Virginia from the trenches at Petersburg, to the surrender at Appomattox. Each campaign is covered at a strategic, rather than a tactical level. Therefore, readers looking for an examination of small-unit battlefield tactics should consider volumes with a narrower scope. Jamieson also ties the military campaigns in with certain political aspects, such as the efforts to establish peace between the armies in the waning days of the war.

In lieu of covering such an expansive topic, the author does an excellent job at keeping the narrative concise, clear, and readable. Entire volumes have been written about some of the closing battles of the Civil War alone, but *Spring 1865* covers two major campaigns thoroughly in the span of a manageable two-hundred pages. Jamieson's narrative construction also contributes to the readability of his book. Each campaign (Grant pursuing Lee from Richmond, and Sherman moving north through the Carolinas) is generally covered in separate chapters, reducing the likelihood of confusion for the reader.

Spring 1865 does have a few minor weaknesses. Although not a criticism of the authorship, the nature of Jamieson's approach, which presents secondary source findings and lacks the color of primary sources, may prove mundane to someone already familiar with the topic. This reviewer is also a firm believer that there can never be enough maps in a military history book. As *Spring 1865* covers numerous geographical locations within its two-hundred pages, at least a half-dozen additional maps would be a welcome addition to the text.

Nevertheless, *Spring 1865: The Closing Campaigns of the Civil War* is a valuable addition to Civil War historiography. By condensing an immense amount of recent secondary source material into such a short and readable volume, Jamieson provides an excellent piece of work that will be welcome as a topic primer, or for the scholar seeking an update on the most recent scholarship in the field.

Nathan Marzoli, Fort McNair, Washington, D.C.

GRANT UNDER FIRE
An Exposé of Generalship & Character in the American Civil War

Joseph A. Rose, Alderhanna Publishing, New York, 2015, 816 pages

Grant Under Fire is a stinging critique of Lt. Gen. Ulysses Grant's character and the historical records that have shaped his popular reputation. The book covers Grant's life prior to and following the Civil War but focuses primarily on his generalship during the war. The author uses a myriad of sources from over a decade of research to highlight the historical distortions of Grant's record. One of the primary targets of the author's research is Grant's own *Personal Memoirs*. *Grant Under Fire* highlights the many false records and outright lies written in Grant's memoirs and later by a host of modern historians that have used his record without questioning its accuracy. The author also outlines Grant's political connections that paved the way for his promotions, and a cabal of journalists that distorted the record by spinning Grant's image in Northern newspapers. Grant's closest colleague, Gen. William T. Sherman, is also exposed by the author as incompetent, morally questionable, and having only been promoted due to the influence of his prominent friend and political allies. This and much more are highlighted in *Grant Under Fire*, including Grant's incompetence, cronyism, alcoholism, and hostility to those he disliked even at the expense of lives and the Union war effort.

Grant Under Fire is not written to attack or impugn Grant's character but to simply set the record straight: a record that was clearly written to place Grant among history's greatest military leaders, a record subsequently honored by the institution of the U.S. Army. I could not ignore the irony of reading this book in my home on Fort Leavenworth, which sits on the main road named in honor of Grant, adjacent to his bronze statue that is also down the hill from the former Command and General Staff College building also named in his honor. Connecting buildings were also named in honor of his two closest protégés: Sherman and Sheridan. These physical impressions are a lasting reminder of Grant's legacy, no matter how it was recorded, and its impact on the U.S. Army in the early twentieth century.

Grant Under Fire is a fascinating book that takes a critical eye to known Civil War records and refutes what many believed to be the sterling image of the general. It is written for more advanced readers and researchers of the Civil War. As written, it is assumed that the reader already has a foundational understanding of events during the war. This book also validates what I have read in other books concerning Grant's character, including Benson Bobrick's book, *Master of War, The Life of General George H. Thomas*. I highly recommend *Grant Under Fire* to anyone with a deep interest in American history or to those looking for an authoritative source for researching general officer leadership and ethics in the American Civil War.

Lt. Col. Andrew P. Creel, U.S. Army,
Fort Leavenworth, Kansas

A CHRISTMAS FAR FROM HOME
An Epic Tale of Courage and Survival During the Korean War

Stanley Weintraub, Da Capo Press, Boston, 2014, 261 pages

Bombs, artillery, rifles, and blood characterized the Christmas of 1950. That holiday season for soldiers and marines in Korea was certainly one they would never forget. *A Christmas Far from Home* by Stanley Weintraub is an essential read for all combat and service support commanders throughout the chain of command.

Weintraub, through primary source material, creates a descriptive image of the post-Thanksgiving offensive and subsequent withdrawal of United Nations (UN) forces in 1950. Even though he provides opinions about Gen. Douglas MacArthur and his "home by Christmas offensive," Weintraub offers ample evidentiary support in his opposition to the offensive. The historical account reads like a novel as it tracks soldiers and marines from the banks of the Yalu River and creates a broad understanding of the withdrawal through multiple individual perspectives. His account sheds a light on one of the most significant turning points in the Korean War, namely the Chinese intervention that pushed the American offensive back through the Chosin Reservoir and Funchilin Pass to the strategic rescue at Hungnam Harbor. *A Christmas Far from Home* is a true Christmas story that offers a broad view of the American and Chinese offensives while incorporating personal accounts of heroism.

This book is not just relevant to the historical community, but also to the security and logistical professions. Weintraub effectively depicts a mass offensive and withdrawal that all field grade officers should study, a mass withdrawal that did not result in a Dunkirk-style catastrophe. While this story needed more maps to depict the movement of individual units, his use of sophisticated diction mapped out the scene in the readers mind. Company grade officers should also take note of this book as the author carefully balances the stories of battalions and regiments with platoons and companies, highlighting the heroes at the lowest level. Weintraub's most important lesson is to never forget, regardless of rank, how to be a soldier including the basic skills of how to fire a rifle, communicate, and move tactically.

As our nation's forgotten war, Weintraub reminds us of the sacrifices made over sixty years ago. The failed UN offensive should not be something we as combat leaders forget, but rather something we learn from. The strategic evacuation from Hungnam harbor is something that is logistically and tactically remarkable. Overall, Weintraub's book reminds soldiers their actions have a direct impact on geopolitics and that they have a responsibility to make well thought-out decisions.

Cadet Casey McNicholas, U.S. Army Cadet Command, Washington State University, Pullman, Washington

CHOOSING COURAGE
Inspiring Stories of What it Means to be a Hero

Peter Collier, Artisan, New York, 2015, 240 pages

In *Choosing Courage*, Peter Collier takes the reader on an educational and emotional journey by highlighting soldiers who received the highest military award (the Medal of Honor) and civilians who received the highest equivalent civilian award (the Citizen Honors Award). For the inspirational stories of the Medal of Honor recipients, he offers historical context from World War II, Korea, Vietnam, Afghanistan, and Iraq. He tells the stories of civilian Citizen Honors awardees who distinguished themselves during the 9/11 attacks and the Sparks Middle School shooting in Sparks, Nevada, and others who worked with the Doctors Without Borders relief organization.

In each illustrated account of courage, there are graphic, inspirational, horrific, and emotional revelations that will keep the reader engaged to the end. In addition, interviews with parents, spouses, children, and friends provide insight into the character of each hero. The stories present accounts of the background and upbringing of these amazing people. They include first- and second-hand accounts of their bravery under the most dangerous and trying conditions. Most revealing, each account provides the reflections of the awardee, which will humble readers and instill in them a renewed appreciation of life and the people around them. These reflections exemplify the human dimension of leadership and the inherent motivation to survive. A statement by a former Vietnam prisoner of war illustrates the power of these stories to inspire: "You survive hard times by using your mind and your imagination and by thinking about the good things you've done. You survive and succeed by focusing your mind on your life goals and never giving up."

In another example, U.S. Army Lt. Vernon Baker, one of seven African-Americans retroactively awarded the Medal of Honor for their actions in World War II, was asked what he learned during his military service. He said, "Give respect before you expect it. Treat people the way they want to be treated. Remember the mission. Set the example. Keep going."

Finally, the author describes Dr. Jordy Cox, who traveled all over the world to treat patients in developing countries during times of war and natural disasters. When awarded the Citizen Honors Award, he stated, "You do what your heart tells you. That's what you are supposed to do."

The book is well written, well organized, and interesting. It provides studies in leadership, motivation, and character building that are appropriate for any educational setting from middle school to university level. It is not exclusively for military readers; there is a civilian context for every account in the book. I recommend *Choosing Courage* for anyone seeking inspiration in the selfless actions of others thrust into situations where life or death is a consequence of doing the right thing.

Col. Michael R. Martinez, U.S. Army, Retired, Fort Leavenworth, Kansas

World War II Innovation

American soldiers and a Sherman tank equipped with hedgerow cutter bust through a hedgerow during the invasion of Normandy, France, circa June 1944. (Photo courtesy of U.S. Army)

Top: Bocage country on the Cotentin Peninsula in lower Normandy, France. (Photo courtesy of Wikipedia)

Right: U.S. soldiers fighting in the hedgerows. (Photo courtesy of U.S. Army)

Army engineers fabricating hedge cutters from the steel beach obstacles left behind by the Germans. (Photo courtesy of World War II Today)

There is arguably no better environment for stimulating innovation than combat. One example is the Culin hedge cutter.

To break out of the beachhead established by the Normandy invasion during World War II, Allied forces needed to push through terrain known as bocage—French farming country with a mix of woodland and pasture. Over hundreds of years, local farmers had divided up the countryside using packed dirt embankments and dense hedges. These hedgerows made formidable obstacles, and teams of German soldiers used them as cover to ambush Allied soldiers and tanks that attempted to scale the embankments.

Demonstrating ingenuity, Sgt. Curtis G. Culin had the idea to modify tanks to break through the obstacles instead of climbing over them. Using steel from the beach obstacles left behind by the Germans, U.S. engineers fabricated hedge cutters and mounted them on the front of U.S. tanks. These modifications enabled the U.S. forces to breach the hedgerows, creating lanes through the obstacles and allowing the Americans to break out of the beachhead and pursue the German Army.