

Social Media as Force Multiplier

An Interview with Terrence J. O'Shaughnessy

The Atmospheric Littoral



Joint Force Quarterly

Founded in 1993 • Vol. 94, 3RD Quarter 2019
<http://ndupress.ndu.edu>

Gen Joseph F. Dunford, Jr., USMC, Publisher
VADM Frederick J. Roegge, USN, President, NDU

Editor in Chief

Col William T. Eliason, USAF (Ret.), Ph.D.

Executive Editor

Jeffrey D. Smotherman, Ph.D.

Production Editor

John J. Church, D.M.A.

Internet Publications Editor

Joanna E. Seich

Copyeditor

Andrea L. Connell

Associate Editor/Book Review Editor

Jack Godwin, Ph.D.

Associate Editor

Patricia Strait, Ph.D.

Intern

Noah W. Garber

Art Director

Marco Marchegiani, *U.S. Government Publishing Office*

Advisory Committee

Charles B. Cushman, Ph.D./*College of International Security Affairs*;
Col David J. Eskelund, USMC/*Marine Corps War College*;
VADM Michael M. Gilday, USN/*The Joint Staff*; RADM Jeffrey A. Harley, USN/*U.S. Naval War College*; MG Lewis G. Irwin, USAR/*Joint Forces Staff College*; MG John S. Kem, USA/*U.S. Army War College*;
LTG Michael D. Lundy, USA/*U.S. Army Command and General Staff College*; Brig Gen Chad T. Manske, USAF/*National War College*;
Col William McCollough, USMC/*Marine Corps Command and Staff College*; LtGen Kenneth F. McKenzie, Jr., USMC/*The Joint Staff*;
LtGen Daniel J. O'Donohue, USMC/*The Joint Staff*;
Col Evan L. Pettus, USAF/*Air Command and Staff College*;
Brig Gen Kyle W. Robinson, USAF/*Dwight D. Eisenhower School for National Security and Resource Strategy*;
Brig Gen Jeremy T. Sloane, USAF/*Air War College*;
Thomas Wingfield, J.D./*College of Information and Cyberspace*

Editorial Board

Richard K. Betts/*Columbia University*; Eliot A. Cohen/*The Johns Hopkins University*; COL Joseph J. Collins, USA (Ret.)/*National War College*; Richard L. DiNardo/*Marine Corps Command and Staff College*; Aaron L. Friedberg/*Princeton University*; Bryon Greenwald/*Joint Forces Staff College*; Douglas N. Hime/*Naval War College*;
Col Jerome M. Lynes, USMC (Ret.)/*The Joint Staff*; Kathleen Mahoney-Norris/*Air Command and Staff College*;
Bert B. Tussing/*U.S. Army War College*

Cover 2 images (top to bottom): Artillery mechanic with Bravo Battery, 3rd Battalion, 12th Marine Regiment, 3rd Marine Division, provides security during Artillery Relocation Training Program 19-1 at Combined Arms Training Center Camp Fuji, April 20, 2019 (U.S. Marine Corps/Josue Marquez); Army paratrooper assigned to 54th Brigade Engineer Battalion, 173rd Airborne Brigade, prepares for airborne operations onto Juliet Drop Zone, Pordenone, Italy, May 21, 2019 (U.S. Army/Paolo Bovo); Army paratrooper assigned to 10th Special Forces Group (Airborne) conducts operation near island of Mont Saint-Michel, Avranches, France, on May 18, 2019, at invitation of Mayor of Avranches, to commemorate liberation of France during World War II (U.S. Army/Alexis K. Washburn)



In This Issue

Forum

- 2 Executive Summary
- 4 An Interview with Terrence J. O'Shaughnessy
- 8 What's Not to Like? Social Media as Information Operations Force Multiplier
By Glenda Jakubowski
- 18 A Framework to Understand and Improve Defense All-Source Intelligence Analysis
By James S. Kwoun

JPME Today

- 26 *A Profession of Arms? Conflicting Views and the Lack of Virtue Ethics in Professional Military Education*
By Thomas J. Statler
- 36 *The Mayaguez Incident: A Model Case Study for PME*
By Gregory D. Miller

Commentary

- 44 *Can the F-35 Lightning II Joint Strike Fighter Avoid the Fate of the F-22 Raptor?*
By Scott Hubinger

Features

- 54 *Joint Integrative Solutions for Combat Casualty Care in a Pacific War at Sea*
By Dion Moten, Bryan Teff, Michael Pyle, Gerald Delk, and Randel Clark
- 64 *Ground Combat Overmatch Through Control of the Atmospheric Littoral*
By George M. Dougherty



About the Cover

F-35 Lightning II demonstration team members sprint to their positions during ground show at Defenders of Liberty Air & Space Show at Barksdale Air Force Base, Louisiana, May 17, 2019 (U.S. Air Force/Alexander Cook)

- 74 *Twenty-First Century Nuclear Deterrence: Operationalizing the 2018 Nuclear Posture Review*
By Ryan W. Kort, Carlos R. Bersabe, Dalton H. Clarke, and Derek J. Di Bello
- 80 *Global Risks and Opportunities: The Great Power Competition Paradigm*
By Mark D. Miles and Charles R. Miller

Recall

- 86 *Flanking the Crater*
By John K. DiEugenio and Aubry J. Eaton

Book Reviews

- 92 *America vs. the West*
Reviewed by Brittany Bounds
- 93 *Strategy, Evolution, and War*
Reviewed by Ryan Shaffer
- 94 *LikeWar*
Reviewed by Brett Swaney

Joint Doctrine

- 96 *Getting the Joint Functions Right*
By Thomas Crosbie
- 100 *Joint Doctrine Update*

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

NDU Press is the National Defense University's cross-component, professional military and academic publishing house.

The opinions, conclusions, and recommendations expressed or implied within are those of the contributors and do not necessarily reflect the views of the Department of Defense or any other agency of the Federal Government.

Copyright Notice

This is the official U.S. Department of Defense edition of *Joint Force Quarterly*. Any copyrighted portions of this journal may not be reproduced or extracted without permission of the copyright proprietors. *JFQ* should be acknowledged whenever material is quoted from or based on its content.

Submissions and Communications

JFQ welcomes submission of scholarly, independent research from members of the Armed Forces, security policymakers and shapers, defense analysts, academic specialists, and civilians from the United States and abroad. Submit articles for consideration to ScholarOne, available at <https://mc04.manuscriptcentral.com/ndupress>, or write to:

Editor, *Joint Force Quarterly*

NDU Press
260 Fifth Avenue (Building 64, Room 2504)
Fort Lesley J. McNair
Washington, DC 20319

Telephone: (202) 685-4220/DSN 325

Email: JFQ1@ndu.edu

JFQ online: ndupress.ndu.edu/jfq

3rd Quarter, July 2019

ISSN 1070-0692

USS LCI(L)-553 and USS LCI(L)-410 land troops on Omaha Beach during initial assault on D-Day, June 6, 1944 (National Museum of the U.S. Navy/Naval History and Heritage Command)



Executive Summary

This June, the world observed the 75th anniversary of the Normandy landings, which marked the beginning of the end of Nazi control in Europe. In what was probably the last time veterans of that combined campaign could meet in company strength, victorious and liberated nations alike honored their service and sacrifice. We all were reminded of the terrible costs of war as well as our collective responsibility to remember such experiences in hopes they will not be repeated.

The awesome power of those young warriors, many of them civilians fresh out of school just months before, shows how well-trained and well-led troops, draftees, and long-serving veterans can achieve strategic ends. A friend sent me a link to a *CBS Reports* video from 1964 that featured Walter Cronkite interviewing President Dwight D. Eisenhower in England, and later Normandy, about the operation.

At the time of the interview, some 20 years after the landing, President

Eisenhower visited those famous places he had not been to since the war. After describing the cost estimates and lack of complete certainty of even committing to the operation by his staff and fellow leaders, he recounted the story of how the hedgerows of Normandy were defeated by the ingenuity of a young sergeant. Ike recalled how Curtis G. Culin III, who after getting an idea from something a buddy of his said, invented a steel forklike device for Allied tanks to use to drive through the walls of dirt and trees. The

general completed his “breakout of the bocage” story with the fact that Culin, a member of the 102nd Mechanized Cavalry Reconnaissance Squadron, New Jersey Army National Guard, was later in the war invalidated and evacuated home.

As Ike and Cronkite walked among the stones of one of the cemeteries above Normandy beach, with the reporter calling out names and units, the general responded immediately with the role of that Soldier’s unit in the battle and the results. What was stunning to see is the fact that after all he had been through, including several near-death health episodes while in office as President, at 74, Ike easily was in command of the facts of that campaign, down to the last detail. Watching the video, I could not help but see what those warriors meant to him, even 20 years later. We are left to wonder about the world he and his coalition were fighting to achieve, and the one he saw in 1964. We should reflect on how what we are doing today in the military ensures that our nation, allies, and partners can produce such a leader and such a generation as Ike and his “boys.”

Our Forum section in this issue opens with an interview of General Terrence J. O’Shaughnessy, USAF, commander of U.S. Northern Command and the North American Aerospace Defense Command. With arguably some of the most important responsibilities in the joint force, he discusses how his commands work to protect the homeland, defend the airspace above the United States and Canada, and how the joint force is working to achieve the Chairman’s Globally Integrated Operations challenge. Next, with the rise of social media’s use as a weapon, Glenda Jakubowski describes how these modern means of communication can be adapted to information operations as a force multiplier. Continuing one of our most important discussion threads issue to issue, James Kwoun discusses an interesting way to reimagine all-source intelligence analysis.

In JPME Today, we present two important articles that primarily speak to the professionals engaged in teaching in our staff and war colleges. As an early look at a chapter from an edited volume

on professional ethics (NDU Press, forthcoming), Thomas Statler tells us how professional military education can renew its focus on the profession of arms and virtue ethics. Recommending the use of historical case studies in our teaching, Gregory Miller then offers us the keys to teaching our future senior leaders about an important but underappreciated civil-military relations moment in the immediate post-Vietnam War period, the *Mayaguez* Incident.

This issue’s Commentary offers an article that also continues discussions we have had—and I expect will continue to have in future issues. After spending a considerable time in his day job and as a student at the Eisenhower School last year, Scott Hubinger provides the case for how the F-35 program will not meet the same end as the F-22. In one way it already has, with more than double the number of aircraft produced to date, but the debate continues as to its value.

Our Features section has a wide range of ideas that emphasize our shift in national security focus to the Indo-Pacific region. Dion Moten, Bryan Teff, Michael Pyle, Gerald Delk, and Randel Clark help us understand the problems surrounding combat casualty care if we were to go to war at sea in the Pacific and how to jointly solve them. Taking joint integration in a different direction, George Dougherty has an interesting view of how land forces can achieve overmatch through control of the “atmospheric littoral.” As nuclear issues and the renewal of our triad of nuclear systems come to the front of the national security debates, Ryan Kort, Carlos Bersabe, Dalton Clarke, and Derek Di Bello help us work through the results of the 2018 Nuclear Posture Review. With a refocusing on great power competition, Mark Miles and Charles Miller discuss the risks and opportunities the United States faces around the world.

In Recall, we present a fascinating look back at the American Civil War brought to us by two young officers and historians, John DiEugenio and Aubry Eaton, who offer a 155-year-old leadership lesson from the Petersburg Campaign of 1864. We also present an

excellent article in Joint Doctrine focusing on joint functions. In an important review and critique, Thomas Crosbie sees the joint functions as needing adjustments to properly work to the joint force’s advantage. We also offer three valuable book reviews and the Joint Doctrine update to round out this issue.

For what it is worth, Ike was a product of our 20th-century American military education system. Before the war, one would have to agree that Ike was an unlikely leader of such an operation as the Normandy landings, so how did he manage it beyond the obvious “help” from senior leaders? Each time he was given an assignment, he learned what he could from it and later applied himself to achieving the best result possible.

What I am left to conclude is that despite the many faults of our very human past (and given the weaknesses of our professional military education system), great leaders have always emerged to help guide us through troubling times. The one clear lesson I take from Eisenhower was the power of history and memory to shape our world view and our vision of what lies ahead. Ike teaches us that our past must be revisited and compared to the world we see in order to bring about the future we want. In 1964, that view of both the past and the future must have been breathtaking for him. What have you learned from the past? What future do you see? Why not write about it and share it with us? You never know when history will come calling. JFQ

WILLIAM T. ELIASON
Editor in Chief



JFQ: What does the overarching guidance of the Department of Defense [DOD] state about homeland defense and your command's role within it?

General O'Shaughnessy: During my career, I have never seen the guidance as clear and vertically aligned as it is today. We start with the National Security Strategy, and its number one pillar is the responsibility to protect the American people, the homeland, and the American way of life. We then go to the NDS [National Defense Strategy] Objective No. 1—defending the homeland. We have this clarity in what we're supposed to be prioritizing, which again for us is homeland defense. We next look at the concept of joint operations, Joint Force 2030, which talks about how we need to integrate forward presence and ensure power protection with increased protection to the homeland and to create that depth to deter and defeat strategic attacks on the homeland. It's important to clarify that it's not an "either/or" situation; it's integration and it's complementary—we need to both defend the homeland and push forward as much as possible.

JFQ: Where does homeland defense fall in relation to other DOD priorities?

General O'Shaughnessy: Homeland defense is our top priority, and I don't think anybody really debates that, per se. For almost my entire career, however, we've had the luxury of not necessarily having to resource homeland defense to the extent that we did other missions. In the past, we've been able to spend our resources on other things because we weren't held at risk in the homeland from conventional threats. Our primary threats were limited to nuclear, ballistic missile, and [violent extremist organization] attacks. But we must reconsider that thinking; our adversaries now possess conventional capability and capacity that must be considered when we think about protecting our nations. Risk will continue to increase if we do not appropriately prioritize and operationalize homeland defense.

An Interview with Terrence J. O'Shaughnessy

General Terrence J. O'Shaughnessy, USAF, is Commander of U.S. Northern Command and North American Aerospace Defense Command.

JFQ: What did you and your command learn in the most recent globally integrated exercise?

General O'Shaughnessy: I'll start by praising the Chairman's efforts to drive these exercises. It's challenging to accomplish them, it's challenging to get the time together with the Joint Staff, the Chairman, the SECDEF [Secretary of Defense], and the combatant commands. You can't do better than having the Chairman play the Chairman, the SECDEF play the SECDEF, and the combatant commanders play the combatant commanders. This particular exercise was the first time all of us actively participated in the exercise, together, so the training value was exponential.

For our NORAD and USNORTHCOM team, who are obviously focused on homeland defense, it really gave us an opportunity to highlight some of the risks and consequences of our mission. As we looked at some of the instances where we are unable to meet homeland defense objectives, repercussions for other combatant commands were highlighted. If we couldn't defend a particular area, for instance, then STRATCOM [U.S. Strategic Command] would have to take action to preserve and protect their forces. General [Curtis M.] Scaparrotti [USA], at the time the EUCOM [U.S. European Command] commander, was concerned about whether the TPFDD [Time Phased Force Deployment Data] would be able to flow, deploying the required forces to his theater—if NORAD and USNORTHCOM can't defend our ports, installations, and lines of communication, he would not be able to get the required force flow and resources to execute his OPLAN [operation plan].

We learned that we are very much interrelated and that what happens in one command certainly impacts the others. When we do an exercise, it becomes much more apparent that global integration is a critical requirement. Our ability to meet homeland defense objectives carries global implications. Quite frankly, we have made great progress, but we still have a long way to go to truly globally

integrate planning and operations. We need to acknowledge that regional conflicts will inherently have global implications.

JFQ: What are our competitors doing that has changed how you view defending the homeland? How are we countering those activities?

General O'Shaughnessy: I'm realizing that we have to see the world as it is, not as we would like it to be, and I would apply that to our adversaries—we cannot assume that our adversaries will fight like we want them to fight. Our classic exercises are designed to begin with a regional issue or conflict, then the scenario quickly fast-forwards to the forces flowing into the respective theater. We successfully set force posture, then we go forth and do great things. But we *know* our adversaries have seen this before. They've seen that movie play out over the last two decades, so they're going to try to prevent us from actually being able to get to that position of strength. They know that once we flow the forces, we will win. We have to exercise our ability to protect power projection and incorporate that into our training, with clear eyes.

[Former Acting Secretary of Defense Patrick] Shanahan has been clear that he wants us, senior [DOD] leadership, to spend our time on the most important things. But it's easy in the day-to-day grind to focus our attention on the urgent, but the urgent isn't necessarily the important. So the [former] Acting Secretary has asked us to purposely look at our calendars, look at our schedules, and drive them so we are spending our time on the most important things we need to deal with.

Again, our homeland defense mission is our top priority, and we're making sure that we are laser-focused on that mission, and the [former Acting] Secretary is holding himself to the same standard, and he has changed his battle rhythm. He's changed the meeting schedules that we have with him to ensure that we are focused on threats as directed within the NDS and that we as combatant

commanders, Service chiefs, and the Joint Staff are spending the appropriate amount of attention on those most important issues.

JFQ: As the commander responsible for homeland defense, what areas are you focused on to continue to ensure proper defense of the homeland?

General O'Shaughnessy: We cannot fight tomorrow's conflict with yesterday's weapons and equipment. As we look at the classic areas we need to defend, then of course, missile defense is important—that's ballistic missiles, cruise missiles—to ensure our ability to protect the homeland from the hypersonic capability our adversaries are developing.

We have also increased our focus on the Arctic. During the Cold War, the Arctic was a significant area of defense for us, where we were well postured to defend against the Soviet Union, its bombers, and its nuclear capability. But we kind of got out of that business—at least a little—so I think it's time to rethink our approach to defending the Arctic. Advancing our ability to maintain all-domain awareness and maintaining the ability to command and control our forces in the Arctic is critically important.

There are also other significant emerging threats to homeland defense. Counter-UAS [unmanned aerial systems] is an area that we really have to focus on, and proliferation of that threat does have us concerned. We're already working closely with nontraditional partners on this issue. Homeland defense and homeland security missions are inseparable, so the multiple organizations within the Department of Homeland Security have been great partners as we consider the counter-UAS threat. As the proliferation of this threat has become significant for us, we're exploring ways to defend against it.

Then there's the cyber domain. If we look at what our adversaries are doing in cyber, we find that they do not view warfare as binary, or ones and zeroes. (We in the West think of warfare as a zero is peace and one is war.)

Our adversaries tend to see a spectrum. Cyber is the perfect example of this concept. As we sit here today, we are in conflict with multiple adversaries in the cyber domain. Yet these conflicts do not necessarily rise to the threshold of serious public discussion, even though the consequences for our nations are significant. We're working closely with the Department of Homeland Security and CISA [Cybersecurity and Infrastructure Agency, a component of DHS] on protection of critical civilian and defense infrastructure. We also know we need to expand our relationships within the civilian and commercial sectors to develop mission partnerships with the shared interest of defending our homelands from the current and future cyber threat. I do have a great partner in [General] Paul Nakasone [USA] at [U.S.] Cyber Command, but clearly this is an area where we need to make sure that we are postured to defend.

JFQ: What are some no-fail requirements we must stay ahead of, particularly in the Arctic?

General O'Shaughnessy: Much like any other area, we want to ensure that freedom of navigation is available to all and that rules based on international order are adhered to. When we see the Russians controlling the Northern Sea Route, for instance, we have concerns. For us to be able to respond to a situation involving something to that end, or whether it be something more like a search and rescue mission, we need a couple of key things. One is to maintain domain awareness—we need to understand what is happening at sea, in the air, and on land in the Arctic region and that's something we need to continue to work on. Second, we need to be able to communicate; our traditional communications methods, unfortunately, don't always work within the Arctic. For example, north of about 65°, our satellite communication is significantly degraded and even traditional navigation methods are hindered.

JFQ: What resources are required to maintain an appropriate homeland defense posture in response to adversarial preparations?

General O'Shaughnessy: The rapidly changing environment that we see in both international security and technology makes it ripe for innovative approaches to the way we do things in the Arctic, in particular. As we look at a way ahead, I don't think, in the words of General [David] Goldfein [Air Force chief of staff], "approaching things with just *new-old*"—in other words, applying new technology to the old way of doing business—is going to get us where we want and need to go.

A clear example of this is found as we prepare to defend against hypersonic weapons. We could put a lot of time, money, and effort into the land-based radar solution that will never get us where we need to be to detect and track a hypersonic weapon; we have to track the weapon throughout its path, from launch to intercept. So this leads us to a *new-new* approach—solving problems in new ways with new technology. But how do we combine these? In many ways it will depend on commercial industry. While certainly our defense industry partners can give us great capability, I think watching what's happening in the commercial world is relevant to our future, especially, again, within the Arctic.

Whether it's One Web or Starlink, the proliferation of LEOs [low-Earth orbit satellites] is something our military needs to take advantage of because of not only space access but also the significant decrease in the cost to reach space. We can also take advantage of the capability that's going to be in LEOs for communications down the road. An intuitive sensing grid—from undersea, to maritime, to terrestrial, to air, to a space-based layer—can ultimately lead to a system of systems. But we have to bring it all together in a resilient, redundant architecture where we can effectively command and control those networked capabilities. I look forward to the day when we have an established, all-domain sensor network, where anything can sense anything. Information

could be brought into a central data bank where that data could ultimately be used to come up with a defeat solution and that solution could be put independently out to a capability to defeat a threat.

On that front is another area where I think we have to find new ways of doing business. Right now, we are on the wrong side of the cost-curve. In other words, we spend millions of dollars per interceptor to defeat either a ballistic missile or a cruise missile and, in the future, hypersonics. We have to flip that cost-curve. Whether that be with direct energy or another emerging technology, we have to find ourselves in a position where we have multiple response options, affording us the flexibility to defend across North America, not just in a point-defense role.

JFQ: You have been forward leaning in your comments about the Arctic. As others talk about cooperation, you have used phrases like "frontline in defending the homeland." Why?

General O'Shaughnessy: First, we must have domain awareness and understand what is happening within that battlespace. This is not only critically important but also something that is very challenging, given the geography and harsh operating conditions there. Second, as I mentioned, we have to be able to communicate. Third, we must have a persistent presence and then, ultimately, the infrastructure to support that presence in the region.

As access to the Arctic is becoming more prevalent, through both commercial and potentially adversarial ways, we see a lot more activity there. This brings to mind how things have been traditionally done in the region, for example, with the Arctic Council, which has been a forum for cooperation. How does this forum play in the future with potential competing interests? We are a proponent for cooperation to the extent that we can, but we must be clear-eyed as we look at what our international partners are doing and understand their motives—and ensure that we're in a position, as we are around the globe, to be advocates for and enforce the rules based on the international order.



Marines conduct joint live-fire training exercise at Fort Greely, Alaska, March 15, 2018, as part of U.S. Army Alaska–led Joint Force Land Component Command in support of exercise Arctic Edge 18, conducted under authority of U.S. Northern Command (U.S. Air Force/Virginia Lang)

JFQ: Your article in this journal on strategic shaping [JFQ 90 (3rd Quarter 2018)] has been one of our more popular in recent years. Does this concept have application to your new commands? If so, how?

General O’Shaughnessy: Absolutely. First, let’s start with the obvious part: Regional conflicts have global implications. The second part is the generation of new thinking through writing. As we began putting pen to paper, our thinking was clarified and we saw seemingly disconnected things come together. For example, when we looked at the actual application of strategic shaping, some characteristics being considered in the Pacific also applied in the NORTHCOM area of operations—especially in terms of instilling doubt in the political leadership of an adversary. We specifically look at defending our homelands and want to ensure that we can instill that same doubt, for different reasons perhaps, as to the value of an adversary attacking the

homeland. We also want to make sure that as we work with our global partners and the other combatant commands, we are part of shaping those strategic dilemmas. So, yes, that thinking is still in play within this command, and we’re using some of the aspects that we used in drafting that article in the same way here at NORTHCOM and NORAD.

JFQ: Let’s shift topic a bit and discuss an important part of professional development. What impact did joint professional military education [PME] have on your joint and international assignments after your graduation from the Industrial College of the Armed Forces [now the Dwight D. Eisenhower School for National Security and Resource Strategy]?

General O’Shaughnessy: PME in general gave me the opportunity to get out of the normal grind and think. Often, we are

so overtasked and just want to get done what we can and move on to the next day. Having the opportunity to actually sit and think and allow my mind to go after some of the issues, whether that was through writing or discussion, was really good.

I also think PME allows students to be exposed in their traditional path, as rising officers in the ranks, to industry. It provided me insight not only to the defense industry but also to the commercial industry. In looking for solutions to some of our homeland defense challenges, I look as much to the commercial industry as I do within the defense industry or traditional DOD means—and I think that seed was planted during my time at ICAF. In some of the partnerships that we’re looking at with commercial industries, we’ve been able to make some advancements by looking at things differently because of what was taught to us through PME. JFQ



EC-130J Commando Solo systems operator monitors broadcast during mission in support of Operation *Inherent Resolve* at undisclosed location in Southwest Asia, September 5, 2017 (U.S. Air Force/Michael Battles)

What's Not to Like?

Social Media as Information Operations Force Multiplier

By Glenda Jakubowski

In June 2013, Vladimir Putin stated that Russia must “break the Anglo-Saxon monopoly on global information streams.”¹ By April 2014, Russia’s Internet Research Agency (IRA) formed the “translator project,” which

“focused on the U.S. population and conducted operations on social media platforms such as YouTube, Facebook, Instagram, and Twitter.”² Four years after the translator project began operations, Special Counsel Robert Mueller issued an indictment against three Russian companies and 13 Russian individuals, alleging Russian actors stole the identities of individual Amer-

icans, posed as individual Americans, posed as American interest groups and political activists, hacked voter registration data, and scraped social media profiles to influence U.S. elections and political processes. The information operations would be “the most effective and efficient influence campaign in world history,” according to Clint Watts, a senior fellow in the Center for

Glenda Jakubowski is an Intelligence Analyst at the Defense Intelligence Agency.

Cyber and Homeland Security at The George Washington University.³ It was social media that made Russia's information operations so effective and efficient, particularly social media-enabled social engineering, identity theft, targeted advertisements, profiling through psychometrics, dissemination through bots, trending algorithms, creation of false personas, and psychological hacks to increase trust and verisimilitude. The psychology behind pleasure, rewards, social groups, and fear makes social media addictive and credible. This is the same psychology that makes social media's use in information operations so pernicious and possibly impossible to counter.

Russia has used social media to foster conspiracy theories, plant rumors, and spread fake news in Bulgaria, Denmark, Estonia, Finland, France, Georgia, Germany, Hungary, Italy, Latvia, Lithuania, Montenegro, the Netherlands, Norway, Serbia, Spain, Sweden, Ukraine, the United Kingdom, and the United States.⁴ Experts have correlated Russian information operations with the referendums on Brexit, Scottish independence, and Catalanian secession from Spain, and in one academic study, researchers correlated Russian information operations with changes in U.S. voter behavior that possibly affected the outcome of the 2016 Presidential election.⁵

Russia's information operations successes, however, are not uniform. Factors that contributed to or mitigated Russian information operations successes include the target nations' historical relationships with Russia, percentage of ethnic Russians in the population, ethnic homogeneity, racial conflict, migration, national control of media and the Internet, and the level of trust between citizens and their governments. Many of these factors make the United States, with its constitutional freedoms, Internet saturation, and political and racial divides, particularly vulnerable to and less able to defend against these information operations.

Social Media Is a Game Changer

According to testimony by Clint Watts before the U.S. Senate Committee on

the Judiciary, five social media functions are necessary for "full-spectrum social media campaigns: reconnaissance, hosting, placement, propagation, and saturation."⁶ Russia used all of these in its information operations against the West. Briefly, *reconnaissance* in social media equates to knowing the target audience, and *hosting* refers to the site, such as YouTube, Facebook, or Twitter. *Placement*, during the Cold War, referred to placing forged items in news outlets that unknowingly published the items as authentic. In current usage, it is placing "digital forgeries" on sites such as 4chan and Reddit that then spread to mainstream sites, fueling conspiracy theories and false narratives. *Propagation* refers to spreading narratives broadly and quickly, which social media particularly enables through such means as bots that cause news items to trend, increasing the likelihood they will jump to mainstream media. Finally, the networked nature of social media enables *saturation* in multiple types of media outlets, which lends credibility to false stories. According to Watts, Russia is the first entity to incorporate the "entire social media ecosystem" into its information operations.⁷

The Social Media Ecosystem

The combination of false news, social media, politics, conspiracy theories, sensationalism—and human nature—creates a perfect propaganda storm. Studying 126,000 news stories shared from Twitter's inception in 2006 until 2017 by approximately 3 million people, researchers found that false news spreads "further, faster, deeper, and more broadly" than legitimate news—even more so for false news about political subjects compared to items about "terrorism, natural disasters, science, urban legends, or financial information."⁸ The researchers found that bots speed the dissemination of true and false stories equally; although bots may increase the amount of information spread through social media, it is humans that spread false news more quickly than factual news. Thus, false tweets reached more people than true

tweets; true tweets rarely reached as many as 1,000 people, compared to false tweets, which routinely reached up to 100,000 people. Additionally, false information spread six times faster than true information, and false political information spread even more quickly and was more viral.⁹

The data scraping enabled by firms such as Cambridge Analytica is an example of reconnaissance. Cambridge Analytica brought "big data and social media to an established military methodology—information operations—then turn[ed] it on the U.S. electorate."¹⁰ The company analyzed potential voters' social media profiles, then sent the users "micro-targeted" Facebook advertisements to influence their voting behavior. In 2017, the Cambridge Analytica chief executive officer (CEO) boasted at a marketing conference that he had about 5,000 separate bits of information on each of 220 million Americans and that his company had "played a significant role" in contributing to the success of the Presidential campaign. Cambridge Analytica applied analysis to these discrete bits of information gleaned from Facebook profiles and from publicly available information to "send the right people to the right ads through cookie matching, mail shots, set-top box viewing data matching, and highly targeted, non-public, paid Facebook posts often referred to as 'dark ads.'"¹¹

In 2014, Cambridge Analytica presented slides on how to disrupt elections to a Russian oligarch with strong ties to Vladimir Putin, ostensibly to solicit oil contracts.¹² Coincidentally, Russia around this time began to use micro-targeting in social media to attempt to influence the 2016 U.S. Presidential election.¹³ In U.S. Senate committee hearings in 2018, when asked whether the 126 million users the Russian IRA targeted with Facebook ads were also among those whose data Cambridge Analytica accessed, Facebook CEO Mark Zuckerberg replied, "We believe it is entirely possible."¹⁴

Whether or not Russia directly used data gained from Cambridge Analytica, by 2015 Russia was using social media to spread conspiracy theories to specific

audiences surrounding issues that would become 2016 campaign hot buttons, including gun rights, big government, and Islamophobia. One of its targets, according to former Central Intelligence Agency director Michael Hayden, was a 2015 U.S. military exercise conducted in seven southern U.S. states called Jade Helm 15.¹⁵

Jade Helm 15 was a U.S. Special Operations Command joint exercise conducted in Texas, New Mexico, Arizona, California, Nevada, Utah, and Colorado from July 15 to September 15, 2015, to improve special operations forces' unconventional warfare capabilities.¹⁶ However, conspiracies propagated on Russia-controlled Instagram, Twitter, and YouTube accounts and Russia-created Facebook pages, such as Heart of Texas, claimed Jade Helm 15 variously was a psychological operation to build complacency about the military's presence in the affected states to enable an eventual invasion, an international or United Nations (UN) operation to seize citizens' guns, a military operation to round up political dissidents, a military operation to remove state and local political leaders who would oppose the Federal Government's imposition of martial law, an operation using recently closed Walmarts to supply invading Chinese troops, or a military plan to impose martial law and disarm citizens in the wake of an apocalyptic meteor strike predicted to occur the same day Jade Helm 15 concluded.¹⁷ As bizarre as they seem, the conspiracies surrounding Jade Helm 15 garnered reactions from U.S. politicians—reactions that gave credence to the Russian information operations. These included Texas governor Greg Abbott calling on the Texas State Guard (equivalent to the National Guard) to monitor the exercise, Senator Rand Paul (R-KY) promising to “look into” the exercise, Senator Ted Cruz (R-TX) assuring constituents that he had inquired about the exercise from Pentagon officials “because the Federal Government has not demonstrated itself to be trustworthy,” and Representative Louie Gohmert (R-TX) demanding the military revamp the exercise “so the Federal Government is not intentionally

practicing war against its own states.”¹⁸ The Jade Helm 15 information operation is an example of hosting, placement, propagation, and saturation.

Russia's social media-enabled information operations continue to garner official responses, which give the impression that Russia's false news is authentic. According to an NBC News report, more than 40 celebrities and politicians were “roped into retweeting or otherwise engaging with accounts created by a Russian ‘troll factory’ to millions of followers,” and 3,000 news outlets worldwide published articles containing embedded Russian troll farm tweets in the runup to the 2016 election—an example of stunningly successful placement.¹⁹ Cross-referencing a list of IRA Twitter handles with archived tweets by nearly 900 politicians and celebrities, NBC found the list of influential people who have retweeted or engaged with Russian propagandists includes President Donald Trump; his son, Donald Trump, Jr.; white nationalist Richard Spencer; Trump political associate Roger Stone; former UN Ambassador Samantha Power; former Ku Klux Klan grand wizard David Duke; Senator John Coryn (R-TX); Kellyanne Conway; Women's March coordinator Linda Sarsour; Michael Flynn, Jr.; Ohio senator Nina Turner; Ted Cruz; former White House communications director Anthony Scaramucci; former White House press secretary Sean Spicer; Sean Hannity; Ann Coulter; Laura Ingraham; Jake Tapper; Lou Dobbs; Nikki Minaj; Sarah Silverman; Trevor Noah; the *Washington Post*; *Breitbart*; *Buzzfeed*; the *Daily Mail*; UN officials; academics; and authors from both the right and left.²⁰ Celebrity retweeters who agree with the original tweets add credibility to the Russian propaganda. But even when celebrities disagree with the original sentiment, their celebrity status aids in the propaganda dissemination through the social media phenomenon of trending.

Social media groups tend to share worldviews, in a phenomenon called *homophily*.²¹ Homophily and data scraping enabled Russia to target social media network groups most likely to believe the

information operations message and most likely to share it with similarly minded groups. In this manner, a false news item can metastasize quickly from a small number of discrete cells to a trending conspiratorial cancer in a matter of days or hours. The Comet Ping Pong conspiracy provides an example.

The information operation involving the “news” that Hillary Clinton and other Democrats were pedophiles running a sex ring out of a restaurant, Comet Ping Pong, in Washington, DC, almost certainly began with the Russian military intelligence service hack of John Podesta's email server on March 19, 2016. Among those emails were exchanges between Podesta and his friend, Comet Ping Pong owner James Alefantis.²² WikiLeaks published the hacked emails on October 7, 2016, and by late October, the first allegations about Comet Ping Pong appeared in a few posts on 4chan and another anonymous message board that purported to cater to New York Police Department (NYPD) users. Within hours of the putative NYPD post, a real person posted about the alleged sex ring on Facebook, citing her “NYPD source.” Four days later, the conspiracy theory-themed show, *Info Wars*, broadcasted the story. The conspiracy also was mentioned on a law enforcement Facebook page, and from there a Russian bot posing as a U.S. Air Force veteran posted it on Twitter. The bot, whose profile picture shows a middle-aged woman, has followers that include former Trump deputy assistant Sebastian Gorka and former National Security Adviser Michael Flynn. Eventually, the Comet Ping Pong conspiracy would be shared 1.4 million times, including by at least 14 Russian bots and by real people including Donald Trump, Jr.; Paul Manafort; Ann Coulter; and Roger Stone. On December 4, 2016, a North Carolina man fired an AR-15 rifle in the occupied Comet Ping Pong restaurant, seeking to free the children he thought were held there as sex slaves for the Clintons and their friends.²³ As of June 2018, a cursory search revealed multiple current social media posts on YouTube, Twitter, and Facebook claiming “Pizzagate” is real and that the Clintons



Comet Ping Pong façade in Washington, DC, December 11, 2016 (Courtesy Farragutful)

and Democrats are continuing to run pedophile and human-trafficking rings.

Why would Russia promote conspiracy theories as part of its information operations? Russia scholar Ilya Yablokov asserts it is because the conspiracy theories are “a specific tool of Russian public diplomacy aimed at undermining the policies of the U.S. Government.”²⁴ Crucially, the conspiracy theories—and the information operations—are not challenges to ideology; Russia’s information operations today are not a reprise of Soviet-era communism-versus-capitalism battles for hearts and minds. The current goal for Russia is to “undermine trust in information generally.”²⁵ Among the ways to do so is to use specific, trustworthy messengers, which is where Russia’s use of stolen social media profiles and micro-targeted outreach come in.

In early June 2016, the Web site DCLeaks went live, featuring stolen emails from the Democratic National Committee. Eventually DCLeaks would post emails stolen from more than 300 high-ranking government and military officials. The U.S. Intelligence Community assesses DCLeaks to be linked to Russian military intelligence and the Russian hacking entity Guccifer 2.0.²⁶ Within days of DCLeaks’s launch, “Melvin Redick,” allegedly of Harrisburg, PA, posted a link to DCLeaks on multiple Facebook group pages.²⁷ Melvin Redick, however, does not exist. He is a fake persona created by Russian actors using the stolen Facebook profile of a Brazilian salesman.²⁸ Similar posts by “Alice Donovan” and “Katherine Fulton” appeared on Facebook the same day.²⁹ As with Melvin Redick, Alice Donovan

and Katherine Fulton are fake personas created by Russian cyber actors. Their posts targeted real Facebook users who Russian cyber actors determined, through psychometric profiling such as that done by Cambridge Analytica, would be most susceptible to their messages. In concert with the Facebook posts, hundreds of Twitter posts also linked to DCLeaks, Guccifer 2.0, or similar sites associated with Russian intelligence. Many of these were fueled by bots, some hijacked legitimate Twitter accounts, and many included the Twitter handles of mainstream news organizations or influential accounts, including @realDonaldTrump.³⁰ These events are examples of reconnaissance, hosting, placement, propagation, and saturation.

A Florida voter was one of the people Russia selected as part of its



Soldiers from Bronco 71 Team, operating with members of civil affairs, psychological operations, and information operations trainers, tie M240B machine gun to saddle during mule packing training, August 1, 2017, Fort Irwin, California (U.S. Army/Austin Anyzeski)

micro-targeting reconnaissance efforts. In August 2016, a stranger sent her a private message on Facebook from a Russia-affiliated fake Facebook group called Being Patriotic, asking her to organize a pro-Trump rally. The Russians chose well in targeting this woman, who showed up for the rally dressed as Hillary Clinton in a prison jumpsuit.³¹ In addition to that person (who was not paid), Russia used micro-targeting to pay multiple Floridians to build cages and pose as Clinton behind bars.³² Another person, also from Florida, responded to a Being Patriotic Facebook request that he host a pro-Trump gathering.³³ Similarly, another Floridian agreed to wave pro-Trump signs at a rally after receiving a phone call in August 2016 from a stranger from a Russian front group called Florida Goes Trump.³⁴ Yet another Floridian received a phone call out of the blue, followed by emails from people she thought to be college students from Texas but who actually

were Russians.³⁵ She received about \$600 and a script from the Russians to don a Hillary Clinton mask and an orange jail jumpsuit to participate in one of 20 pro-Trump rallies in Florida scheduled for the same day in August. And still another individual received a similar payment after Russians posing as Americans contacted him on the Being Patriotic Facebook page, asking him to build a cage as part of the same rally.³⁶

None of the targeted Americans, when informed of the Russian origins of the requests for political activity, considered the Russian interference a problem. They dismissed concerns over the Russian effort as a “waste of time,” insisted they would have held rallies for Trump or parodied Clinton anyway without Russian trickery, and claimed the Russian efforts had no effect because the targeted voters “didn’t need persuading.”³⁷

Many of the examples above demonstrate the psychological aspects of social

media that make it so effective as a force multiplier in information operations. They show Russia’s use of psychological factors such as homophily, or retweets by trusted or influential people, or receiving phone calls, emails, and private messages from “friends,” to pressure its adversaries to accept false stories as truthful. In addition to these, Russia also exploits the fact that social media itself has been designed to activate areas in the brain associated with rewards and addiction.

According to neuroscientist Shannon Odell, people use social media such as Facebook and Twitter for two reasons: to connect with people and to control the impressions they make on others. The “like,” “share,” or “retweet” is positive reinforcement for both of those motivators, activating neural pathways for reward and addiction.³⁸ Additionally, when users in one experiment were shown photographs, the photographs with more “likes” activated the brain’s reward

circuitry more than the photographs with fewer “likes.” People are apt to approve of social media posts their friends approve of, even if those “friends” are strangers.³⁹ Yet another study corroborates the power of the “like,” finding that social media users are more likely to adopt those emotions that are “over-expressed in their social network.”⁴⁰ The level of emotional “contagion” is significantly influenced when the agent seeking to spread an idea uses bots. Russian information operations benefited from not only the mechanics of bot propagation and troll farm employees generating multiple “likes” and “shares” to influence trends algorithms, but also the psychological tendencies of humans exposed to bot propagation and to “peer group” emotions. A user confronted with false news on social media that comes appended with hundreds of bot-generated “likes” is psychologically apt to believe and spread the false news.

Among the most pervasive questions regarding social media and false news in the 2016 U.S. election is did they make a difference in the final vote tally. A definitive answer is difficult. However, according to one scholarly study and *Washington Post* analysis, the data correlate with an affirmative response. Using multiple regression analyses, Ohio State University researchers concluded that believing false news encountered on social media was among the top four variables predicting that a voter who previously supported Barack Obama would “defect from the Democratic ticket in 2016.” Respondents to an Ohio State survey who believed at least one false news item plucked from social media were 4.5 times more likely to have voted against Clinton than respondents who believed none of the false news items in the survey.⁴¹ Using the Ohio State data in predictive probability analysis, the *Washington Post* polling director assessed that false news likely cost Clinton 4.2 percent of votes overall and approximately 2.2 percentage points in the battleground states of Michigan, Pennsylvania, and Wisconsin. In the 2016 election, Clinton lost Michigan by 0.2 percentage points, Pennsylvania by 0.72 percentage points, and Wisconsin by 0.76 percentage points.⁴²

Europe’s Answer to Russian Information Operations

Finland is the commonly cited example of how to counter Russia’s information operations. Finland’s tactics include a public diplomacy program with support from the Finnish president, who declared it the responsibility of every citizen to combat Russian information operations, and support from the prime minister’s office, which enrolled hundreds of government officials in programs to understand how disinformation spreads. Experts also credit Finland’s public education system—which ranks top in the world—with building critical thinking skills that help strengthen Finns against disinformation. Additionally, Finns have a high level of trust in their government and a high level of distrust for Moscow. Finland also has demographics to thank for its ability to fend off Russian propaganda; the Finnish population of 5.5 million is quite homogeneous, with a minimal number of Russian speakers.⁴³ Only 3.5 percent of people living in Finland are foreign born, one of the lowest rates in the European Union (EU), and the Russian population in Finland is 0.5 percent, compared to 93 percent native Finns.⁴⁴ Finns are more alike than they are different from one another, which makes it difficult for information campaigns focused on exploiting social rifts to take hold.

Other Baltic nations, such as Latvia, Lithuania, and Estonia, have been less successful against Russian information operations. These nations have larger numbers of Russian speakers among their populations and the strong presence of the Russian-language, Russia-owned television station, Channel One. In Finland, the Russia-owned, Russian-language Sputnik television station lacked enough viewers to remain operational; in Latvia, Lithuania, and Estonia, government moves to block Russian programming backfired, leading to protests from the Russian populations in those countries and feeding the Russian propaganda narrative of marginalization.⁴⁵ The Baltic states do focus on countering Russian

propaganda, but “if you only focus on countering, you’re on their territory,” stated a member of the Strategic Communications Center of Excellence in Latvia.⁴⁶ Finland is an outlier, then, and it seems unfair to suggest others use it as a model, when the variable that likely works most toward Finland’s favor—its homogeneity—is outside other nations’ control. Other European countries have been tackling the Russian information operations problem, including, in some cases, the social media aspect of the operations. Some examples follow:

- **Tracking False News**
 - Britain, France, Germany, the Czech Republic, the Netherlands, Switzerland, Finland, Sweden, Ukraine, Latvia, and Slovakia maintain sites to track false news and social media conspiracy theories.⁴⁷
 - The EU’s EAST Stratcom Task Force publishes a weekly disinformation review in 18 languages—including calling out fake fact-checkers that appear to be the work of Russia.⁴⁸
- **Working with Media, Social Media, and Advertisers**
 - More than 1,400 advertisers in Slovakia are boycotting a list of false Web sites compiled by a non-profit researcher.⁴⁹
 - The night before the French presidential election, Russian military intelligence hackers released hacked emails and documents connected to then-candidate Emmanuel Macron. Most French media outlets agreed to election commission requests to refrain from publishing the hacked documents.⁵⁰
 - Facebook agreed to requests from France and Britain to disable multiple thousands of false accounts connected to elections.⁵¹
 - Sweden urges all mainstream media to fact-check news stories.⁵² Mainstream media, of course, is not the major purveyor of false stories, and Sweden so far is doing nothing about the Russian



U.S. psychological operations Soldiers with Combined Joint Special Operations Task Force–Iraq conduct radio-in-a-box training with members of Iraqi Counter-Terrorism Service psychological operations team, in Baghdad, February 10, 2019 (U.S. Army/Sarah K. Anwar)

trolls that are averaging 2,000 comments per person, per inflammatory news item posted on a right-wing site.⁵³

■ Legal Measures

- The French electoral code makes it illegal to “broadcast to the public by any means of electronic communication anything that could be considered electoral propaganda.”⁵⁴
- The EU has enacted a code of practice against disinformation aimed at social media companies that requires them to prevent “disinformation and the manipulative use of platforms’ infrastructure.”⁵⁵
- On May 25, 2018, the EU enacted the General Data Protection Regulation (GDPR), which applies to all companies doing business in the EU regardless of the companies’ locations. The GDPR guarantees EU citizens the

right to know of data breaches within 72 hours, the right to access their data from social media companies and to know where and for what purpose their data is used, the “right to be forgotten,” the right to data portability, and the right to privacy by design—that is, the inclusion of data protection from the onset of designing systems. Failure to abide by the GDPR can result in tiered fines of up to 4 percent of profits or 20 million euros.⁵⁶

- **Political Cooperation.** German political parties agree not to use bots in their social media campaigns. (Russia continues to use bots on social media in Germany, however.)⁵⁷
- **Public Diplomacy.** Sweden distributes pamphlets advising Swedes what to do in case of war with Russia, or terrorist attacks, in an attempt to shape how Swedish citizens think about Russia.⁵⁸

■ Countermessaging

- The United Kingdom, Germany, Latvia, Lithuania, and Estonia are countermessaging Russia Today and Sputnik “news” items.⁵⁹
- Also, in Lithuania, citizen volunteers who call themselves elves “identify and beat back the ‘trolls’ employed on social media to spread Russian disinformation.”⁶⁰

- **Government Initiatives.** In Sweden, the Swedish Civil Contingencies Agency, which is roughly equivalent to the U.S. Department of Homeland Security, monitors Web sites for false, inflammatory stories.⁶¹

What About the United States?

The United States shares some challenges with its European partners in fighting Russian information operations and also has some U.S.-specific challenges. The United States is far from homogeneous; according to the Census Bureau in 2017, about 60.7 percent of



Civilian role players help 80th Training Command's psychological operations students learn to negotiate difficult terrain of cultural, social, and political differences during training exercise at Fort Hunter Liggett, California, February 6, 2019 (U.S. Army/Cynthia McIntyre)

the population is white, 18.1 percent is Hispanic (which can be any race), 13.4 percent is black, 5.8 percent is Asian, 2.7 percent are mixed race, and 1.5 percent are other.⁶² Russia laser-targeted racial and social divides in America during the runup to the 2016 election, as well as controversies over immigration, gun control, Islamophobia, gay rights, and other divisive topics. Russia continues, post-election, to use social media in information operations to “create general distrust or confusion about information sources by blurring the lines between fact and fiction.”⁶³

The United States is unlikely to enact a domestic propaganda program such as Finland’s. Reforms of the Smith-Mundt Act in 2013 allow domestic broadcasts of State Department programming produced for foreign audiences, such as Voice of America broadcasts, but forbid broadcasting propaganda *targeting* American audiences.⁶⁴ However, reactions from some politicians and defense officials to the reforms indicate the suspicion

many in the United States feel toward government information programs. Opponents claimed the reforms would make Americans vulnerable to government disinformation campaigns to “prop up unpopular policies” and “remove protections” against U.S. Government information campaigns targeting U.S. citizens that may be “inaccurate or completely false.”⁶⁵ That the opponents were themselves presenting inaccurate information about the new Smith-Mundt Act did little to reduce confusion surrounding the reforms, but much to illuminate the distrust many Americans likely would feel toward a domestic government information campaign.

After Facebook CEO Mark Zuckerberg’s House and Senate testimony on Cambridge Analytica’s breach of users’ data, Senator Amy Klobuchar (D-MN) and Senator John Kennedy (R-LA) introduced the Social Media Privacy Protection and Consumer Rights Act, which is similar to the GDPR. The bill requires social media companies to disclose

to users what data are being collected on them, who has access to user data, and how companies that have that access are using the data. The bill also allows users to opt out of having their data collected and to demand that Web sites delete any data that had been collected on them.⁶⁶ As of this writing, the proposal has been sitting in the Commerce, Science, and Transportation Committee since late April 2018.⁶⁷

Conclusion: A Social Media Problem Requires a Social Media Solution

Measures such as the Code of Practice on Disinformation, GDPR, and Social Media Privacy Protection and Consumer Rights Act will mitigate social media-enabled information operations because they empower privacy and data protection. However, these measures will not eliminate the psychological aspects of social media that make it such a powerful tool for information operations. Humans are motivated by

desire and fear. Just as “likes” activate areas of the brain associated with desire, conspiracy theories and false news about other races, other religions, and other opinions activate fears in susceptible audiences. What makes the United States strong—its technology, its diversity, its commitment to free speech—also, unfortunately, makes it enduringly vulnerable to information operations by an adversary such as Russia.

The Constitution prohibits the U.S. Government from restricting free speech. But private companies are free to set their own limits, and indeed, social media companies such as Facebook have removed hundreds of fake accounts since the hearings looking into Russia’s use of social media in its information operations. Public scrutiny can pressure private companies to prohibit data mining and practice due diligence against foreign entities using their platforms against the United States. The United States can mitigate—somewhat—social media-enabled information operations. But governments cannot mitigate neuropsychology. No amount of critical thinking education, anti-Russia pamphleteering, domestic propaganda, or “outing” Russia (recall the Americans duped by Russians who, after learning the truth, stated they were unconcerned about being Russian targets) will eliminate the neural feedback loop that is reinforced every time users are deceived by hundreds of artificially placed “likes” or retweets. Humans are wired to believe. JFQ

Notes

¹ Jill Dougherty, “How the Media Became One of Putin’s Most Powerful Weapons,” *The Atlantic Monthly*, April 21, 2015, available at <www.theatlantic.com/international/archive/2015/04/how-the-media-became-putins-most-powerful-weapon/391062/>.

² *United States v. Internet Research Agency et al.*, Case 1:18-cr-00032-DLF, February 16, 2018, available at <www.justice.gov/file/1035477/download>.

³ Clint Watts, “Clint Watts’ Testimony: Russia’s Info War on the U.S. Started in 2014,” *The Daily Beast*, March 30, 2017, available at <www.thedailybeast.com/clint-watts-testimony-russias-info-war-on-the-us-started-in-2014>.

⁴ U.S. Senate Committee on Foreign Relations, “Putin’s Asymmetric Assault on Democracy in Russia and Europe: Implications for U.S. National Security,” S. Prt. 115-21, 115th Cong., 2nd sess., 2018, available at <www.foreign.senate.gov/imo/media/doc/FinalRR.pdf>.

⁵ *Ibid.*; Richard Gunther, Paul A. Beck, and Erik C. Nisbet, “Fake News May Have Contributed to Trump’s 2016 Victory,” Ohio State University, March 8, 2018, available at <www.documentcloud.org/documents/4429952-False-News-May-Have-Contributed-to-Trump-s-2016.html>.

⁶ Clint Watts, “Extremist Content and Russian Disinformation Online: Working with Tech to Find Solutions,” Judiciary Subcommittee on Crime and Terrorism questions for the record, October 31, 2017, and hearing, November 7, 2017, available at <www.judiciary.senate.gov/imo/media/doc/Watts%20Responses%20to%20QFRs.pdf>.

⁷ *Ibid.*

⁸ Soroush Vosoughi, Deb Roy, and Sinan Aral, “The Spread of True and False News Online,” *Science* 359, no. 6380 (March 9, 2018), 1146–1151, available at <<http://science.sciencemag.org/content/359/6380/1146.full>>.

⁹ *Ibid.*

¹⁰ Carole Cadwalladr, “‘I Made Steve Bannon’s Psychological Warfare Tool’: Meet the Data War Whistleblower,” *The Guardian*, March 18, 2018, available at <www.theguardian.com/news/2018/mar/17/data-war-whistleblower-christopher-wylie-faceook-nix-bannon-trump>.

¹¹ Charles Kriel, “Fake News, Fake Wars, Fake Worlds,” *Defence Strategic Communications* 3 (Autumn 2017), 172–190.

¹² Cadwalladr, “‘I Made Steve Bannon’s Psychological Warfare Tool.’”

¹³ *United States v. Internet Research Agency et al.*

¹⁴ “Transcript of Mark Zuckerberg’s Senate Hearing,” *Washington Post*, April 10, 2018, available at <www.washingtonpost.com/news/the-switch/wp/2018/04/10/transcript-of-mark-zuckerbergs-senate-hearing/?utm_term=.ce270a6edca3>.

¹⁵ Cassandra Pollock and Alex Samuels, “Hysteria Over Jade Helm Exercise in Texas Was Fueled by Russians, Former CIA Director Says,” *Texas Tribune*, May 3, 2018, available at <www.texastribune.org/2018/05/03/hysteria-over-jade-helm-exercise-texas-was-fueled-russians-former-cia/>.

¹⁶ U.S. Army Special Operations Command, “Request to Conduct Realistic Military Training (RMT) JADE HELM 15,” 2015, available at <<https://docs.google.com/file/d/0B3axduyL0jdjZQUjhsSmJsZTA/edit>>.

¹⁷ Jim Shea, “Thank You Texas and Good Luck with the Invasion,” *Hartford Courant*, May 17, 2015, available at <www.courant.com/features/too-shea/hc-shea-weekinreview-0517-20150517-column.html>; Jon Austin, “U.S.

Military Secretly Planning for Giant Asteroid That Will Wipe Out Mankind in September,” *Daily Express* (London), June 8, 2015, available at <www.express.co.uk/news/weird/583002/US-military-secretly-preparing-asteroid-wipe-out-mankind-September-Jade-Helm>.

¹⁸ Pollock and Samuels, “Hysteria Over Jade Helm Exercise in Texas Was Fueled by Russians.” Patrick Svitek, “Jade Helm 15: The Black Helicopters Are Coming. Well, Maybe Not,” *Texas Tribune*, April 30, 2015, available at <www.texastribune.org/2015/04/30/abbotts-letter-puts-jade-helm-national-stage/>; David Weigel, “Ted Cruz Says He Has Asked the Pentagon for Answers on Jade Helm 15,” *Bloomberg*, May 2, 2015, available at <www.bloomberg.com/news/articles/2015-05-02/ted-cruz-says-he-has-asked-the-pentagon-for-answers-on-jade-helm-15>; Louie Gohmert, “Gohmert Statement on Jade Helm Exercises,” May 5, 2015, available at <<https://gohmert.house.gov/news/documentsingle.aspx?DocumentID=398216>>.

¹⁹ Ben Popken, “Russian Trolls Duped Global Media and Nearly 40 Celebrities,” NBC News, November 3, 2017, available at <www.nbcnews.com/tech/social-media/trump-other-politicians-celebs-shared-boosted-russian-troll-tweets-n817036>.

²⁰ *Ibid.*

²¹ Jarred Prier, “Commanding the Trend: Social Media as Information Warfare,” *Strategic Studies Quarterly* 11, no. 4 (2017), 50–85.

²² Cecilia Kang, “Fake News Onslaught Targets Pizzeria as Nest of Child-Trafficking,” *New York Times*, November 21, 2016, available at <www.nytimes.com/2016/11/21/technology/fact-check-this-pizzeria-is-not-a-child-trafficking-site.html>.

²³ Amanda Robb, “Anatomy of a Fake News Scandal,” *Rolling Stone*, November 16, 2017, available at <www.rollingstone.com/politics/politics-news/anatomy-of-a-fake-news-scandal-125877/>.

²⁴ Ilya Yablokov, “Conspiracy Theories as a Russian Public Diplomacy Tool: The Case of Russia Today (RT),” *Politics* 35, no. 3/4 (2015), 301–315.

²⁵ Kate Starbird, “Information Wars: A Window into the Alternative Media Ecosystem,” HCI and Design at UW, March 14, 2017, available at <medium.com/hci-design-at-uw/information-wars-a-window-into-the-alternative-media-ecosystem-a1347f32fd8f>.

²⁶ “Background to ‘Assessing Russian Activities and Intentions in Recent U.S. Elections’: The Analytic Process and Cyber Incident Attribution,” ICA 2017-01D (Washington, DC: Office of the Director of National Intelligence, January 6, 2017), available at <www.dni.gov/files/documents/ICA_2017_01.pdf>.

²⁷ Scott Shane, “The Fake Americans Russia Created to Influence the Election,” *New York Times*, September 7, 2017, available at <www.nytimes.com/2017/09/07/us/politics/russia-facebook-twitter-election.html>.

²⁸ Scott Shane, "Mystery of Russian Fake on Facebook Solved, by a Brazilian," *New York Times*, September 13, 2017, available at <www.nytimes.com/2017/09/13/us/politics/russia-facebook-election.html>.

²⁹ Shane, "The Fake Americans Russia Created to Influence the Election."

³⁰ Ibid.

³¹ Anton Troianovski et al., "The 21st-Century Russian Sleeper Agent Is a Troll with an American Accent," *Washington Post*, February 17, 2018, available at <www.washingtonpost.com/business/technology/the-21st-century-russian-sleeper-agent-is-a-troll-with-an-american-accent/2018/02/17/d024ead2-1404-11e8-8ea1-c1d91fccc3fe_story.html?utm_term=.aa5c01a98cfa>.

³² *United States v. Internet Research Agency et al.*

³³ Troianovski et al., "The 21st-Century Russian Sleeper Agent Is a Troll with an American Accent."

³⁴ Ashley Parker and John Wagner, "'Go Donald!': Inside the Russian Shadow Campaign to Elect Trump," *Washington Post*, February 16, 2018, available at <www.washingtonpost.com/politics/go-donald-inside-the-russian-shadow-campaign-to-elect-trump/2018/02/16/dea562c2-134a-11e8-9065-e55346f6de81_story.html?utm_term=.a1ce4565b4bd>.

³⁵ Frank Cerabino, "Local Trump Supporters Shrug Off Being Paid and Played by Russians," *Palm Beach Post*, February 23, 2018, available at <www.palmbeachpost.com/news/local-trump-supporters-shrug-off-being-paid-and-played-russians/3WCytHAHy-3PodLVePUIPMK/>.

³⁶ Ibid.

³⁷ Parker and Wagner, "'Go Donald!'; Troianovski et al., "The 21st-Century Russian Sleeper Agent Is a Troll with an American Accent."

³⁸ Shannon Odell, "Your Brain on Social Media: Neuroscientist Shannon Odell Explores the Insatiable Effects and Drivers of Social Media Addiction," *PR Newswire*, April 24, 2018.

³⁹ "Social Media 'Likes' as Yummy as Chocolate," *Science Teacher* 83, no. 6 (2016), 20–22.

⁴⁰ Emilio Ferrara and Zeyao Yang, "Measuring Emotional Contagion in Social Media," *PLOS ONE* 10, no. 10 (2015), 1–14, available at <<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0142390>>.

⁴¹ Gunther, Beck, and Nisbet, "False News May Have Contributed to Trump's 2016 Victory."

⁴² Aaron Blake, "A New Study Suggests False News Might Have Won Donald Trump the 2016 Election," *Washington Post*, April 3, 2018, available at <www.washingtonpost.com/news/the-fix/wp/2018/04/03/a-new-study-suggests-fake-news-might-have-won-donald-trump-the-2016-election/?utm_term=.ddaa357e0020>.

⁴³ Reid Standish, "Why Is Finland Able to Fend Off Putin's Information War?" *Foreign Policy*, March 1, 2017, available at <<http://foreignpolicy.com/2017/03/01/why-is-finland-able-to-fend-off-putins-information-war/>>.

⁴⁴ See "Finland Population 2019," World Population Review, available at <<http://worldpopulationreview.com/countries/finland-population/>>; and "Finland Demographics Profile 2018," Index Mundi/CIA World Factbook, available at <www.indexmundi.com/finland/demographics_profile.html>.

⁴⁵ Standish, "Why Is Finland Able to Fend Off Putin's Information War?"

⁴⁶ Christian Caryl, "If You Want to See Russian Information Warfare at Its Worst, Visit These Countries," *Washington Post*, April 5, 2017, available at <www.washingtonpost.com/news/democracy-post/wp/2017/04/05/if-you-want-to-see-russian-information-warfare-at-its-worst-visit-these-countries/?utm_term=.1ab2a9e9a132>.

⁴⁷ Dana Priest and Michael Birnbaum, "Europe Has Been Working to Expose Russian Meddling for Years," *Washington Post*, June 25, 2017, available at <www.washingtonpost.com/world/europe/europe-has-been-working-to-expose-russian-meddling-for-years/2017/06/25/e42d-cecc-4a09-11e7-9669-250d0b15f83b_story.html?utm_term=.8e9dd9d96071>.

⁴⁸ "Behind the Scenes at the Swedish Troll Factory," EU vs. Disinformation Campaign, February 20, 2017, available at <<https://euvs-disinfo.eu/behind-the-scenes-at-the-swedish-troll-factory/>>.

⁴⁹ Priest and Birnbaum, "Europe Has Been Working to Expose Russian Meddling for Years."

⁵⁰ Alex Hern, "Macron Hackers Linked to Russian-Affiliated Group Behind U.S. Attack," *The Guardian*, May 8, 2017, available at <www.theguardian.com/world/2017/may/08/macron-hackers-linked-to-russian-affiliated-group-behind-us-attack>; Priest and Birnbaum, "Europe Has Been Working to Expose Russian Meddling for Years."

⁵¹ Priest and Birnbaum, "Europe Has Been Working to Expose Russian Meddling for Years."

⁵² Michael Birnbaum, "Sweden Is Taking on Russian Meddling Ahead of Fall Elections. The White House Might Take Note," *Washington Post*, February 22, 2018, available at <www.washingtonpost.com/world/europe/sweden-looks-at-russias-electoral-interference-in-the-us-and-takes-steps-not-to-be-another-victim/2018/02/21/9e58ee48-0768-11e8-aa61-f3391373867e_story.html?utm_term=.b871124aed50>.

⁵³ "Behind the Scenes at the Swedish Troll Factory."

⁵⁴ Kim Willsher and Jon Henley, "Emmanuel Macron's Campaign Hacked on Eve of French Election," *The Guardian*, May 6, 2017, available at <www.theguardian.com/

<www.theguardian.com/world/2017/may/06/emmanuel-macron-targeted-by-hackers-on-eve-of-french-election>.

⁵⁵ Julia Fioretti, "EU Piles Pressure on Social Media Over Fake News," Reuters, April 26, 2018, available at <www.reuters.com/article/us-eu-internet-fakenews/eu-piles-pressure-on-social-media-over-fake-news-idUSKB-N1HX15D>.

⁵⁶ General Data Protection Regulation portal, available at <www.eugdpr.org>.

⁵⁷ Priest and Birnbaum, "Europe Has Been Working to Expose Russian Meddling for Years."

⁵⁸ Birnbaum, "Sweden Is Taking on Russian Meddling Ahead of Fall Elections."

⁵⁹ Caryl, "If You Want to See Russian Information Warfare at Its Worst, Visit These Countries."

⁶⁰ Priest and Birnbaum, "Europe Has Been Working to Expose Russian Meddling for Years."

⁶¹ Ibid.

⁶² U.S. Census Bureau Quick Facts, 2017, available at <www.census.gov/quickfacts/fact/table/US/PST045217>. These percentages add to 102.2 percent. To reach the correct 100 percent, one has to subtract those who identified as "White alone" (76.6 percent) from those who identified as "White alone, not Hispanic or Latino" (60.7 percent). The resulting difference has to be subtracted from those who identified as "Hispanic or Latino." The resulting difference of 2.2 percent, after subtracting from 102.2 percent, then corrects the overall percentage. The seemingly incorrect numbers are the result of overlapping identities.

⁶³ Watts, "Clint Watts' Testimony: Russia's Info War on the U.S. Started in 2014."

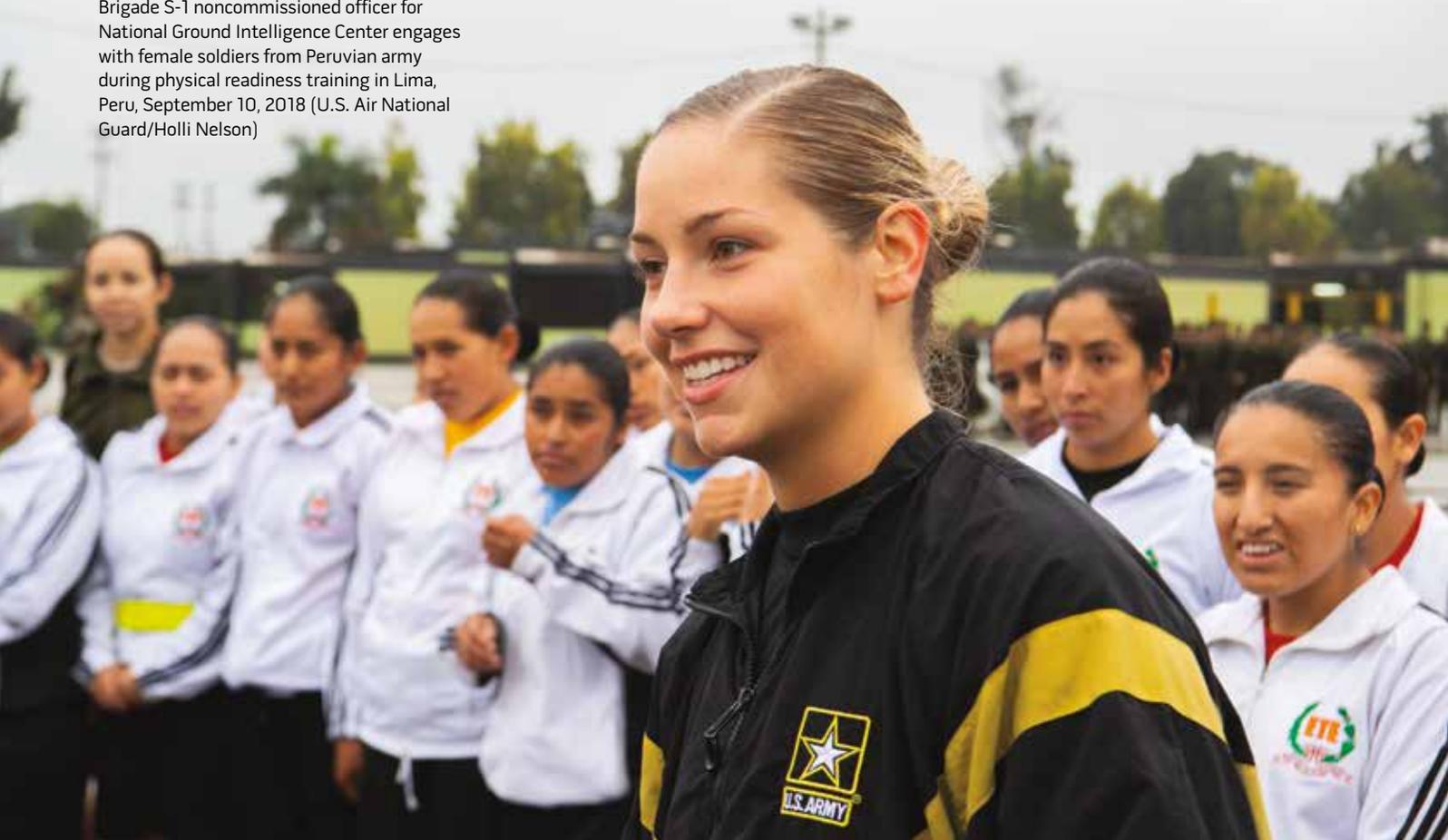
⁶⁴ John Hudson, "U.S. Repeals Pro-paganda Ban, Spreads Government-Made News to Americans," *Foreign Policy*, July 13, 2013, available at <<https://foreignpolicy.com/2013/07/14/u-s-repeals-propaganda-ban-spreads-government-made-news-to-americans/>>.

⁶⁵ Michael Hastings, "Congressmen Seek to Lift Propaganda Ban," *Buzzfeed*, May 18, 2012, available at <www.buzzfeed-news.com/article/mhastings/congressmen-seek-to-lift-propaganda-ban>.

⁶⁶ Harper Neidig, "Senators Introduce Bipartisan Privacy Bill," *The Hill*, April 24, 2018, available at <<https://thehill.com/policy/technology/384550-senators-introduce-bipartisan-internet-privacy-bill>>.

⁶⁷ "Social Media Privacy Protection and Consumer Rights Act of 2018," 115th Cong., S.2728, 2018, available at <www.congress.gov/bill/115th-congress/senate-bill/2728>.

Not in My Squad workshop facilitator and Brigade S-1 noncommissioned officer for National Ground Intelligence Center engages with female soldiers from Peruvian army during physical readiness training in Lima, Peru, September 10, 2018 (U.S. Air National Guard/Holli Nelson)



A Framework to Understand and Improve Defense All-Source Intelligence Analysis

By James S. Kwoun

The Department of Defense (DOD) is a hierarchical organization with parallel planning and execution cycles at the tactical, operational, and strategic levels of war. These cycles also exist for defense all-source

intelligence analysis. The nature of analysis at each level is unique enough that it requires specialized training and experience to truly master. Currently, there is no common framework that sufficiently explains the differences between all-source analysis at each of the levels of war. In the absence of such a framework, leaders lack the means to holistically visualize the entire DOD analytic workforce in a manner that

allows for the identification of training gaps and interoperability issues. Consequently, there are missed opportunities to optimize the employment and career development of analysts.

The need for a common framework is evident in the diversity that exists within joint and strategic intelligence organizations. There is a significant convergence of military personnel and civilian analysts at the Defense Intelligence

Major James S. Kwoun, USA, is a Strategic Intelligence Officer serving as a Branch Chief at the Defense Intelligence Agency.

Agency (DIA), Joint Staff, combatant commands (CCMDs), and Service intelligence centers. For most military officers, the first joint or strategic assignment typically occurs at the mid-career point (upon promotion to major or lieutenant commander) after they have been thoroughly indoctrinated at the tactical and operational levels within their respective Service cultures. Similarly, civilian analysts who predominantly operated at the strategic level are increasingly called on to fill positions at the operational level in joint task forces (JTFs) engaged in combat operations. As military personnel and civilian analysts make these transitions, they quickly realize that there are distinct cultural and doctrinal differences at each level in the DOD hierarchy. A clear framework and common frame of reference are critical in promoting interoperability and mitigating the initial learning curve during these transitions.

There is a distinct gap in the current body of literature. Although there is no shortage of writing on intelligence analysis, much of the existing literature focuses on select topics applicable to only one or two levels of war. Intelligence professionals must synthesize a large volume of documentation to gain a holistic understanding of the DOD all-source analytic community. This problem is partially caused by the fact that analysts usually develop expertise at only one particular level. This situation can lead to the false assumption that all-source analysis at each level shares the same attributes without fundamental differences. Joint Publication 2-01, *Joint and National Intelligence Support to Military Operations*, and Service publications such as Army Field Manual 2-0, *Intelligence*, provide useful starting points for understanding intelligence at each echelon. This article aims to provide greater clarity and insight regarding the differences between defense all-source analysis at each of the levels of war.

Defense Intelligence All-Source Analysis Enterprise

The DIA director is the senior unified intelligence officer in DOD and reports directly to the civilian Under

Secretary of Defense for Intelligence. The director manages the General Defense Intelligence Program (GDIP) budget that is subordinate to the National Intelligence Program, which is ultimately controlled by the Office of the Director of National Intelligence. The director also manages the DIA component of the broader Military Intelligence Program (MIP) budget that is controlled by the Office of the Secretary of Defense. These two budgets managed by the DIA director—GDIP and DIA MIP—fund a significant portion of what is called the Defense Intelligence All-Source Analysis Enterprise (DIAAE). The organizations that comprise this enterprise include DIA (which includes the Joint Staff J2 Directorate as a subordinate organization), CCMD Joint Intelligence Operations Centers (JIOCs), and the four Service intelligence centers.¹ These are the organizations authorized to produce DOD's official analytic positions on strategic intelligence issues.

A main feature of the enterprise is the alignment of analytic organizations with key DOD decisionmakers. DIA has a broad range of customers, but as Lieutenant General Robert Ashley, USA, the current DIA director, stated in September 2018, "My core mission is to make sure the Secretary of Defense is never surprised."² The Joint Staff J2 directly supports the Chairman of the Joint Chiefs of Staff, the CCMD JIOCs support their respective combatant commanders, and the four Service intelligence centers support their respective Service leadership. Analysts from these organizations provide strategic-level assessments tailored to the unique decisionmaking requirements of their primary customers.

Each analytic organization has additional responsibilities to the broader enterprise beyond supporting its primary customer. According to DOD Instruction 5105.21, the DIA director is responsible for establishing a "unified production framework" and "assigning defined all-source intelligence analytic responsibilities" for the enterprise.³ For example, the Army's National Ground Intelligence Center, one of four

Service intelligence centers, has dual responsibilities of responding to intelligence requirements generated by the Department of the Army, while serving as the designated enterprise lead for analysis of foreign ground forces.⁴ Thus, the DIA director, as the leader of the all-source analytic enterprise, leverages each organization's existing mission and unique vantage point to benefit a wider community.

This arrangement creates multiple accountability chains for each analytic organization. Organizations must directly support their primary customers while contributing to broader enterprise production requirements. In many cases, these two responsibilities overlap, but in some cases, the needs of an organization's primary customer may be different than those of the broader enterprise. For example, a combatant commander can direct his JIOC to produce an assessment on a high-priority topic that primarily affects his or her command. At the same time, the JIOC may be responsible for contributing analysis for an enterprise-wide product led by DIA that will eventually be disseminated to a diverse audience throughout the interagency community. This product may only be marginally relevant to the combatant commander's mission, but it may require JIOC participation due to the assigned role of a CCMD JIOC in the enterprise.

The existence of functional management in the enterprise adds complexity to this accountability system. The DIA director for analysis is dual-hatted as the DOD functional manager for all-source analysis.⁵ This functional management responsibility does not confer any authority to task or employ analysts to fulfill intelligence requirements. That authority still resides with the commanders and directors of each analytic organization. This arrangement is analogous to the relationship between the Service chiefs and combatant commanders. Service chiefs build and maintain the force, while combatant commanders employ the force. Similarly, the DIA director for analysis trains and provides analysts to organizations in the enterprise, while each organization's leadership chain retains



All-source intelligence technician assigned to 2nd Battalion, 34th Armored Regiment, 1st Armored Brigade Combat Team, reviews significant activity during exercise Allied Spirit X in Hohenfels, Germany, April 8, 2019 (U.S. Army/Thomas Mort)

management and tasking authority over assigned analysts.

A House Armed Services Subcommittee hearing in February 2017 supports this analogy. Neil Wiley, the current DIA director for analysis, summarized his responsibilities, telling lawmakers that he is “responsible for the alignment, quality, and integrity of the analytic output at DIA, the Service intelligence centers, and the combatant commands.”⁶ Later in the hearing, Mr. Wiley clarified his role by stating, “We are interested in the consistency, integrity, and probity of the analytic process, rather than interested in the actual analytic outcome.”⁷ During the same hearing, Major General Mark Quantock, USA, then the J2 of U.S. Central Command, stated, “I have made it very clear . . . analysts that are from DIA that work at combatant commands work for the combatant commander; they work for the J2.”⁸

Service-Retained Capabilities

The four Services are represented in the DIAAE, but not all the Services’ all-source analytic capabilities are considered part of this enterprise. Each of the Services maintains analytic capabilities for its internal use at the tactical and operational levels. There is a standing authorization in DOD Instruction 3115.17 for the Services to maintain “intelligence capabilities necessary to fulfill Service-specific intelligence needs.”⁹ These capabilities are the pool from which ad hoc JTFs are resourced in response to a crisis. They are designed to support requirements generated by local commanders on a battlefield, rather than strategic requirements under the DIA director’s enterprise management authorities.

The distinction between enterprise and Service-retained capabilities reflects a deliberate institutional design within

DOD. This institutional design is partially the result of separate funding sources that dictate whether activities are supporting Intelligence Community (IC), DOD, or Service-level missions. A significant portion of the enterprise’s strategic analytic mission is funded through budgets managed by the DIA director, either the GDIP or the DIA MIP. In contrast, Service-retained intelligence capabilities are predominantly funded through separate MIP funds controlled by each of the Services, rather than the DIA director. In general, the GDIP provides funding for activities that support the broader IC, whereas the MIP provides funding for activities unique to DOD or the Services.

In addition to funding sources, the unique intelligence requirements at each level of war influence the institutions that comprise the DOD all-source analytic community. The assessments that support strategic leaders in making decisions are

often insufficient to help tactical and operational commanders employ forces in combat. The intellectual rigor required to characterize a strategic defense issue is fundamentally different from the instincts required to template an enemy force in sufficient detail to enable operational planning and targeting. In addition, the time horizon is significantly different at each level, with analysis at lower echelons focused on shorter term issues that are more practical than conceptual in nature. These differences create a need for decisionmakers to have dedicated and tailored analytic support.

This reality compels the Services to invest significant resources into building and maintaining organic intelligence capabilities that are optimized for employment on a battlefield. The majority of DOD intelligence analysts are military personnel who work at the tactical and operational levels in Service-retained units. In the Army, a significant portion of these capabilities reside in tactical formations. Every Army unit at the battalion level and above has its own S2 or G2 intelligence staff that primarily (but not exclusively) consists of all-source analysts. Additionally, all brigade combat teams in the total Army have an organic military intelligence company with analytic and collection capabilities. This force design at the tactical level is intended to ensure a minimum level of self-sufficiency on a battlefield, while laying a foundation for units to be augmented with additional capabilities prior to deployment.

The Services also maintain significant analytic capabilities at the operational level. For example, the Intelligence and Security Command (INSCOM) is the Army's operational-level intelligence force and consists of 17 subordinate units. Its personnel are dispersed across 180 worldwide locations.¹⁰ INSCOM's theater intelligence brigades provide personnel for the analysis and control element for Army Service Component Commands (ASCCs) that are subordinate to each of the geographic CCMDs. To support formations below the ASCC level, the Army maintains expeditionary military intelligence brigades that are aligned with each of the Army's three

corps headquarters. Overall, the Army dedicates significant intelligence capabilities—both collection and analysis—at all echelons.

These Service-retained intelligence capabilities are employed under a different paradigm than those enterprise capabilities addressing DOD strategic requirements. They are considered part of a local commander's battlefield arsenal, no different conceptually than armor or artillery. Intelligence is one of seven joint functions that form the core basis for assessing a military unit's combat power. The other joint functions include command and control, information, fires, movement and maneuver, protection, and sustainment. Whereas strategic analysts have real-world production requirements in both war and peace, many Service analysts are considered wartime assets who are largely focused on training and readiness when not deployed.

Compared to strategic analytic organizations, Service-retained intelligence capabilities are less centralized and are distributed across tactical and operational formations. For example, key intelligence leaders in the Army have supervisors who are not intelligence officers. Intelligence officers who serve as S2s and G2s ultimately work for commanders who come from the predominant career field of the units they lead. Similarly, commanders of military intelligence companies organic to brigade combat teams work for battalion commanders who are not intelligence officers. Even at higher echelons, this pattern holds true. Commanders of INSCOM theater intelligence brigades are under the operational control of their respective theater Army commander, the ASCC commander. In a tactical and operational context, intelligence is generally considered an integral part of combined arms teams under the control of military commanders, rather than stand-alone capabilities concentrated in large fusion centers that respond directly to strategic decisionmakers.

Training and Processes

DOD all-source analysts are trained according to Service-specific standards or DIA tradecraft standards. These

standards are not uniform because they reflect the different Service missions and the unique analytic requirements at each level of war. The Services are responsible for providing their respective uniformed analysts with initial training focused on operating at the tactical level in a particular domain of war. In the Army, for example, a uniformed analyst's initial training is focused almost entirely on ground-based tactical intelligence. In the Navy, initial training can encompass imagery interpretation, targeting support, and all-source analysis tailored for the maritime domain. At the strategic level, DIA civilian analysts receive tradecraft training that is predominantly designed for application at the strategic level.

The Services teach enlisted analysts and intelligence officers the intelligence preparation of the battlefield (IPB) process, the primary analytic tool used for many tactical formations. According to Army Techniques Publication 2-01.3, IPB is a "systemic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations."¹¹ Conducted in four steps, IPB culminates in multiple enemy courses of action and associated high-value targets that serve as inputs for separate planning and targeting processes. Analysts will also identify unique differences between enemy courses of action and translate these differences into indicators for collection. Collection against these unique indicators will help confirm or deny which of the assessed courses of action the enemy is actively taking steps to implement. IPB is applied differently by the Services based on their unique warfighting requirements, but the underlying process remains the same.

At the operational level, many Service analysts still use IPB as the default process, but it is applied on a broader scale and supplemented with additional methodologies to address the increased complexity of the operational environment. For example, operational design is a conceptual planning methodology specifically intended to address complex and ill-structured problems. This

methodology is typically taught to majors and lieutenant commanders attending Service staff colleges, such as the Army's Command and General Staff College. Although operational design is not entirely an intelligence tool, it has subordinate frameworks specifically designed for use at the operational level, such as center of gravity analysis, that can assist all-source analysts.

The joint version of IPB is known as joint intelligence preparation of the operational environment (JIPOE), which contains four steps that are similar to the IPB process. However, there are key differences. According to Joint Publication 2-01.3, JIPOE emphasizes a "macro-analytic" approach that aims for a "holistic" understanding of the operational environment, whereas IPB generally requires "micro-analysis" to support "individual operations" conducted by Service component commands.¹² While IPB can be used at both the tactical and operational levels, JIPOE is predominantly an operational-level process, given the echelons that typically serve as JTFs and use this joint process.

The CCMD JIOC is a unique hybrid organization because of its doctrinal role at both the operational and strategic levels. This dual status has two implications. First, CCMD JIOCs are subject to DIA analytic tradecraft standards, and its civilian analysts are subject to the same training requirements as those assigned to DIA headquarters. In fact, the civilian analysts who work at CCMD JIOCs are DIA employees. Second, CCMD JIOCs are primary users of the JIPOE process. In its operational role, CCMDs produce theater campaign plans and various contingency plans. JIPOE is a necessary process in the broader joint planning process that develops these operational plans. Thus, CCMD JIOCs use analytic processes and standards associated with both the operational and strategic levels.

At the national level, DIA has its own tailored analytic tradecraft based on the broader standards established in Intelligence Community Directive 203. DIA uses the directive's analytic standards as the baseline to create tailored tradecraft for the agency's defense-oriented

product lines. Some of these tailored standards are introduced to DIA analysts in the Professional Analyst Career Education course, which is mandatory for all civilian analysts. Although many of the topics taught in the course are based on universal principles involving logic and reasoning, the deliberate manner in which they are enforced at DIA is unique to the strategic level. DIA has strict enforcement mechanisms to ensure a consistent and logical flow of analytic lines to its key customers.

Key Attributes

All-source analysis at the tactical and operational levels requires an intuitive understanding of military operations. Military analysts are trained to recognize conditions on a battlefield that may not initially stand out to outside observers. For example, experienced Army or Air Force analysts can make predictive battlefield assessments based on the unique way an enemy force arrays its key capabilities in relation to the local terrain. They will recognize the vulnerabilities inherent in the operations being considered by the friendly commander, which will help tailor their analysis of the enemy. Military analysts may derive some of their knowledge using what joint doctrine refers to as "combat information," such as observations by combat patrols, fighter aircraft, or unmanned aerial systems that have not been processed into serialized reports.¹³ In general, tactical and operational analysts do not strive to formally publish products—they strive to operationalize knowledge by addressing the dynamic intelligence requirements generated on a fluid battlefield.

Similarly, strategic intelligence has unique attributes, and DOD analysts at this level generally provide two categories of analysis. First, they provide strategic insights to support national policy deliberations, major DOD acquisition decisions, and strategic engagements by senior DOD officials. Second, they support the warfighters by providing the foundational military intelligence that enables more detailed analysis by CCMD JIOCs and JTF J2s. Most strategic analysts are civilians

who possess deep subject matter expertise in a particular account. Unlike their tactical and operational counterparts, strategic analysts are not expected to assess how foreign militaries fight beyond a certain scale and level of detail. However, they are expected to assess broader issues related to foreign militaries and the implications for U.S. interests.

In further contrast to strategic intelligence, tactical and operational intelligence are also inherently process-driven endeavors. The JIPOE process is closely integrated with the joint planning process that generates the plans or orders for every operation. Furthermore, JIPOE often produces the initial inputs for targeting and collection. Unit intelligence officers also have a role in establishing and rehearsing sensor-to-shooter processes, working to ensure their unit's organic collection assets can rapidly disseminate information to artillery, attack aviation, or joint fires assets. There are many interrelated processes that occur simultaneously in a typical military headquarters, which generate unique challenges for uniformed analysts. During combat operations and in training environments, these processes are conducted rapidly in a time-compressed environment against an adaptive enemy.

In anticipation of these challenges, many intelligence staffs in military units (with exceptions) tend to focus on training their internal processes, rather than building deep knowledge on regional issues. For example, the Army's requirement to maintain forces that are globally deployable makes it impractical for many intelligence staffs to prioritize knowledge development. Although the Army regionally aligns its units with geographic CCMDs, the uncertainty of the operational environment makes it difficult to predict the next contingency. Units must prepare for multiple contingencies by practicing processes that are universally relevant across the range of military operations. Furthermore, the doctrinal IPB and JIPOE processes are designed to address specific military problems on a local battlefield, rather than broad geopolitical or strategic issues. On a battlefield, these broad strategic issues serve as critical



Army airborne technician systems specialist (right) and deputy mission control commander, both with Army JSTARS, participate in emergency drill onboard E-8C Joint STARS during routine training mission at Robins Air Force Base, Georgia, March 21, 2019 (U.S. Air National Guard/Nancy Goldberger)

context for military units, but they do not represent the main intelligence problem set for uniformed analysts in the field.

All-source analysts at the strategic level are generally insulated from the time constraints and external distractions that tactical and operational analysts typically face on a battlefield or in a training center. For example, the risk of enemy artillery destroying an Army unit's command post, including the intelligence staff, is a real concern during large-scale combat operations. Moreover, command posts and intelligence staffs must frequently relocate (that is, "jump" the command post) if their respective units are conducting movement and maneuver against a near-peer enemy force. Relatively speaking, strategic analysts operate in conditions conducive to deep intellectual thought. The enterprise organizations that conduct strategic analysis

use deliberate and methodical processes to communicate carefully developed analytic lines to strategic decisionmakers. This working environment is significantly different than the chaos of a battlefield or training center.

There is an interdependent relationship among analysts throughout the echelons, despite contrasts in the nature of their duties. According to the official DIA strategy, a core responsibility of the agency is to provide foundational military intelligence, the "comprehensive understanding of foreign military capabilities, infrastructure, and materials" that "underpins every aspect of warfighting."¹⁴ As the name implies, this type of intelligence provides the initial baseline knowledge that CCMD JIOCs or JTF J2s can use to produce their own tailored intelligence with enough details to enable operations. This process continues down each

echelon as analysts in subordinate units refine existing intelligence products from their higher headquarters.

This relationship is evident in two doctrinal product lines in the enterprise. DIA produces dynamic threat assessments (DTAs) to support the development or revision of top-priority CCMD contingency plans. DIA also produces theater intelligence assessments (TIAs) for steady-state CCMD theater campaign plans.¹⁵ These products provide the initial baseline knowledge for CCMD JIOCs to conduct further analysis tailored to their unique theater-level needs. Specifically, the DTA and TIA provide the analytic starting points for CCMD JIOCs to initiate the operationally focused JIPOE process. The JIPOE process builds on the DTA and TIA, culminating in specific enemy courses of action that are used by CCMD J5 planners to



Air Force all-source intelligence analyst with 94th Fighter Squadron maps out ground-to-air target scenarios for Red Flag 17-4 mission planning at Nellis Air Force Base, Nevada, August 23, 2017 (U.S. Air Force/Carlin Leslie)

develop the friendly courses of action that form the core of any theater campaign plan or contingency plan. This type of interdependence continues through each echelon below the CCMD.

Problems and Recommendations

Training gaps and interoperability issues become apparent when examining the broad framework established in the preceding sections. First, DIA civilians routinely serve at CCMD JIOCs and JTFs without standardized training on operational processes that are essential to how joint forces plan and execute missions. Second, military officers assigned to DIA for the first time usually have no familiarity with DIA's entire product lines or analytic tradecraft standards. Finally, there are notable challenges when military officers—who grew up learning one intelligence paradigm—are suddenly placed in leadership roles at DIA that require understanding of a fundamentally different paradigm. Conversely, the same challenges exist when civilian analysts are placed in leadership roles in operational headquarters—in

particular, JTFs engaged in combat operations—and are making decisions using an intelligence paradigm that is not optimal for their environment.

These gaps and issues can be mitigated by implementing three key recommendations. The first recommendation is to cross-train both civilian and military analysts in multiple analytic methodologies. In general, DOD needs to reduce the gap between what is taught in military schools and DIA training courses. Specifically, civilian analysts assigned to a CCMD JIOC or JTF should be taught the joint planning process, operational art and design, and JIPOE in particular. Existing Service staff colleges or joint professional military education programs can be leveraged to this end. Alternatively, DIA could create an abbreviated 2-week course on these topics with a short culminating exercise at the end. This instruction is particularly important because CCMDs have occasionally served as the primary joint operational headquarters for large-scale combat operations without a subordinate JTF to help control the fight, which was the case for Operations *Desert Storm* and *Iraqi Freedom*.

Additionally, DIA analytic tradecraft should be incorporated as a minor addition to the curriculum at Service intelligence schools that train junior intelligence officers and enlisted analysts. At a minimum, this addition would reinforce the Services' efforts to develop agile intelligence professionals by providing additional analytic options on the battlefield. In limited cases, DIA analytic tradecraft can be modified for use at the tactical and operational levels, particularly during deliberate planning. Some commanders' decision points on a battlefield require deep analysis and significant staff work to support. If time and space allow, a slower but more methodical analytic process could be ideal when supporting these types of decision points. This exposure to DIA tradecraft would also ease the learning curve for military personnel who eventually get assigned to strategic intelligence organizations.

The second recommendation is to create a structured program that expands short-term opportunities for civilian analysts to observe military operations in the field and the intelligence staffs who support local commanders. The program should be tailored to the unique needs of analysts throughout the enterprise and set broad expectations for when they should seek these opportunities during their careers. For example, new civilian analysts focused on adversary ballistic missiles would benefit from a weeklong experience embedded with an Air Force missile combat crew. More senior analysts can embed with the G2 staff of an Army corps for a few weeks during a command post exercise to learn the role of intelligence in ground combat. These experiences will help civilian analysts understand how military units below the theater level use foundational military intelligence produced by the DIAAE. Conversely, military analysts will learn more about the national capabilities available to support deployed forces by interacting with their civilian counterparts.

The third recommendation is to expand the current IC civilian joint duty program to include more assignments at the operational level. The 2004

Intelligence Reform and Terrorism Prevention Act established service in more than one IC element as a prerequisite for promotion to the senior executive service. The current joint duty program is designed primarily to facilitate the civilian workforce's horizontal exposure to different strategic-level organizations in the IC. For defense analysts in particular, vertical exposure to military intelligence staffs at lower echelons can be equally beneficial. The IC already recognizes this benefit and offers joint duty credit for deployments to combat zones. However, these opportunities do not go far enough. The IC (and DOD in particular) should also prioritize peacetime assignments below the theater level—such as the N2 intelligence staff of a Navy carrier strike group—as desirable options for joint duty credit. Promoting shared experiences between defense civilians and military personnel would mitigate current interoperability challenges.

Conclusion

DOD intelligence leaders must facilitate shared understanding of the broader all-source analytic community that exists within the department. This shared understanding must include knowledge beyond the work conducted by any particular agency or group of analysts at any particular level. It must encompass the work conducted by the entire analytic community from the tactical to the strategic levels. There is a significant convergence of military personnel and civilian analysts at DIA, Joint Staff, CCMDs, and Service intelligence centers. Within these organizations, there is likely to be a large disparity in analytic training and experiences. Leaders must fully understand these disparities because they will certainly exist as strengths and limitations in the organizations they lead.

The framework contained in this article fills a gap in the current body of literature and is intended to facilitate the shared understanding necessary for intelligence officers to lead DOD all-source analysts. Intelligence leaders can get an initial baseline understanding of their analysts' background using the broad

framework contained in this article. This framework can also guide leaders' subsequent conversations with their analysts as part of a larger mentorship and professional development program. These efforts will result in informed decisions regarding the employment and career development of all-source analysts within DOD.

More important, the framework offered by this article aims to provide the impetus for fresh thinking on ways to address training gaps and interoperability issues between military and civilian analysts. These analysts routinely work together in strategic intelligence organizations, but many do so without awareness of the lens through which their counterparts view defense all-source analysis. This situation is not ideal in promoting optimal team performance. Furthermore, there are interdependent relationships between analysts at all levels as they routinely conduct top-down and bottom-up refinement of intelligence assessments through collaborative processes. Shared understanding is required to optimize these interdependent relationships throughout the DOD hierarchy. The recommendations offered by this article are merely starting points for future debates and discussions on the topic. The first step is to have a common framework that can be used to clearly define problems and initiate movement on mitigating those problems. JFQ

Notes

¹ Department of Defense (DOD) Instruction 3115.17, *Management and Oversight of DOD All-Source Analysis* (Washington, DC: DOD, November 16, 2016), 6, available at <www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/311517_dodi_2016.pdf>.

² Robert Ashley, "A Discussion on National Security with DIA Director Robert Ashley," Center for Strategic and International Studies, YouTube video, 4:30, September 19, 2018, available at <www.youtube.com/watch?v=694w6EAUaow>.

³ DOD Directive 5105.21, *Defense Intelligence Agency* (Washington, DC: DOD, March 18, 2008), 4, available at <www.esd.whs.mil/Portals/54/Documents/DD/issuances/dod-510521p.pdf>.

⁴ U.S. Army Intelligence and Security Com-

mand, "National Ground Intelligence Center," September 21, 2018, available at <www.inscom.army.mil/MSC/NGIC.aspx>.

⁵ Neil Wiley, "Intelligence and U.S. Operations Against ISIS," C-SPAN, video, 51:18, February 28, 2017, 31:50, available at <www.c-span.org/video/?424663-1/defense-officials-testify-intelligence-us-operations-isis>.

⁶ *Ibid.*, 31:50.

⁷ *Ibid.*, 46:00.

⁸ "DIA Director for Analysis Briefs Congress on Tradecraft," Defense Intelligence Agency Public Affairs, March 7, 2017, available at <www.dia.mil/News/Articles/Article-View/Article/1104959/dia-director-for-analysis-briefs-congress-on-tradecraft/>.

⁹ DOD Instruction 3115.17, *Management and Oversight of DOD All-Source Analysis*.

¹⁰ U.S. Army Intelligence and Security Command, "Command Overview," September 21, 2018, available at <www.inscom.army.mil/Organization/>.

¹¹ Army Techniques Publication 2-01.3, *Intelligence Preparation of the Battlefield* (Washington, DC: Headquarters Department of the Army, November 10, 2014), 1-1, available at <https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/atp2_01x3.pdf>.

¹² Joint Publication (JP) 2-01.3, *Joint Intelligence Preparation of the Operational Environment* (Washington, DC: The Joint Staff, May 21, 2014), I-5, available at <<https://jdeis.mil/jdeis/index.jsp?pindex=27&pubId=579>>.

¹³ JP 2-01, *Joint and National Intelligence Support to Military Operations* (Washington, DC: The Joint Staff, July 5, 2017), GL-8, available at <www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp2_01_20170705v2.pdf>.

¹⁴ "Defense Intelligence Agency: Strategic Approach," Defense Intelligence Agency, September 2018, 11, available at <www.dia.mil/Portals/27/Documents/About/DIA_Strategic_Approach.pdf>.

¹⁵ JP 2-01, III-5.



Senior Chief Aviation Support Equipment Technician Augustine Ilomuanya, assigned to amphibious assault ship USS Makin Island, conducts dress white uniform inspection, San Diego, March 22, 2019 (U.S. Navy/Colby A. Mothershead)

A Profession of Arms?

Conflicting Views and the Lack of Virtue Ethics in Professional Military Education

By Thomas J. Statler

The nation that will insist upon drawing a broad line of demarcation between the fighting man and the thinking man is liable to find its fighting done by fools and its thinking by cowards.

—GENERAL SIR WILLIAM BUTLER

Commander Thomas J. Statler, USN, is the Command Chaplain in the Joint Forces Staff College at the National Defense University. This article will appear as a chapter in *A Persistent Fire: The Strategic Ethical Impact of World War I on the Global Profession of Arms*, ed. Timothy S. Mallard and Nathan H. White (NDU Press, forthcoming).

The profession of arms is viewed in one of two ways by those who put on a military uniform. One perspective sees what they do as

an *occupation*—the principle means of making a living. From an occupational point of view, the profession of arms is a collection of technical skills, or what I call a more quantitative view, that encompasses performing the duties that are expected of them, but such performance may not necessarily be a part of their self-identity. The evaluation of their job is associated with some end result: increasing profit margin, meeting quotas, completing a mission or report, and the like. In the military, extensive training hones skills in a particular context to reach desired outcomes by higher authorities.

The second perspective on military service is more qualitative and rooted in the wording of the concept *profession of arms* itself. Don Snider outlined this perspective in a lecture at the U.S. Naval War College in 2016 where he described a *profession* as having four components. The professional thus:

- provides a vital service to the society that it cannot provide for itself, but still must have to flourish
- works with expert (abstract) knowledge developed into human expertise; does not participate in routine or repetitive work; takes years of study and experiential learning
- earns and maintains trust of his or her society by the effective and ethical application of his or her expertise; the means of social control is the ethic
- is, therefore, granted relative autonomy in the application of his art and expertise.¹

The contrast between seeing military service as an occupation versus as a member of a profession creates a problem for *professional military education* (PME).² To be more specific, the two italicized terms in the phrase are exactly where the root of the problem lies. I will further define the problem in the first person for clarity and ease of language.

If I only see my time as a military officer as an occupation—as a specialized and highly trained job that I do and for which I get paid—then I am not likely to seek out broader knowledge and higher

levels of education, including ethical education, unless I am compelled/ordered to do so by some higher authority (or a representative of that higher authority). In such cases, I am likely to view that experience as extensive training that I must accomplish to do my job as required by that higher authority. If I do attend a PME institution out of self-interest, it is to set myself up for a promotion that, in turn, leads to more income. In such circumstances, I am a highly skilled, perhaps high-ranking military technician but *not* a military professional. I have not taken seriously the moral and ethical components of being a member of the *profession* of arms and the soft power skills required for both effective staff work and leadership, and instead have only done what is necessary for my job.³ The shared or core values of my service and the joint force are not related to the performance of my job.

This dichotomy of *occupation* versus *profession* is important because PME seems to assume that professional education is synonymous with occupational training—for example, giving officers specific skill sets like joint planning. This hypothesis stems from personal experience and cases of moral, ethical, and legal failure among a glaring minority of military officers, including field-grade and flag/general officers, who have gone through some form of PME prior to their misconduct. Such behavior suggests that the words *professional* and *education* in the acronym PME have lost their meaning to the point where it should be called *occupational military training* instead.⁴

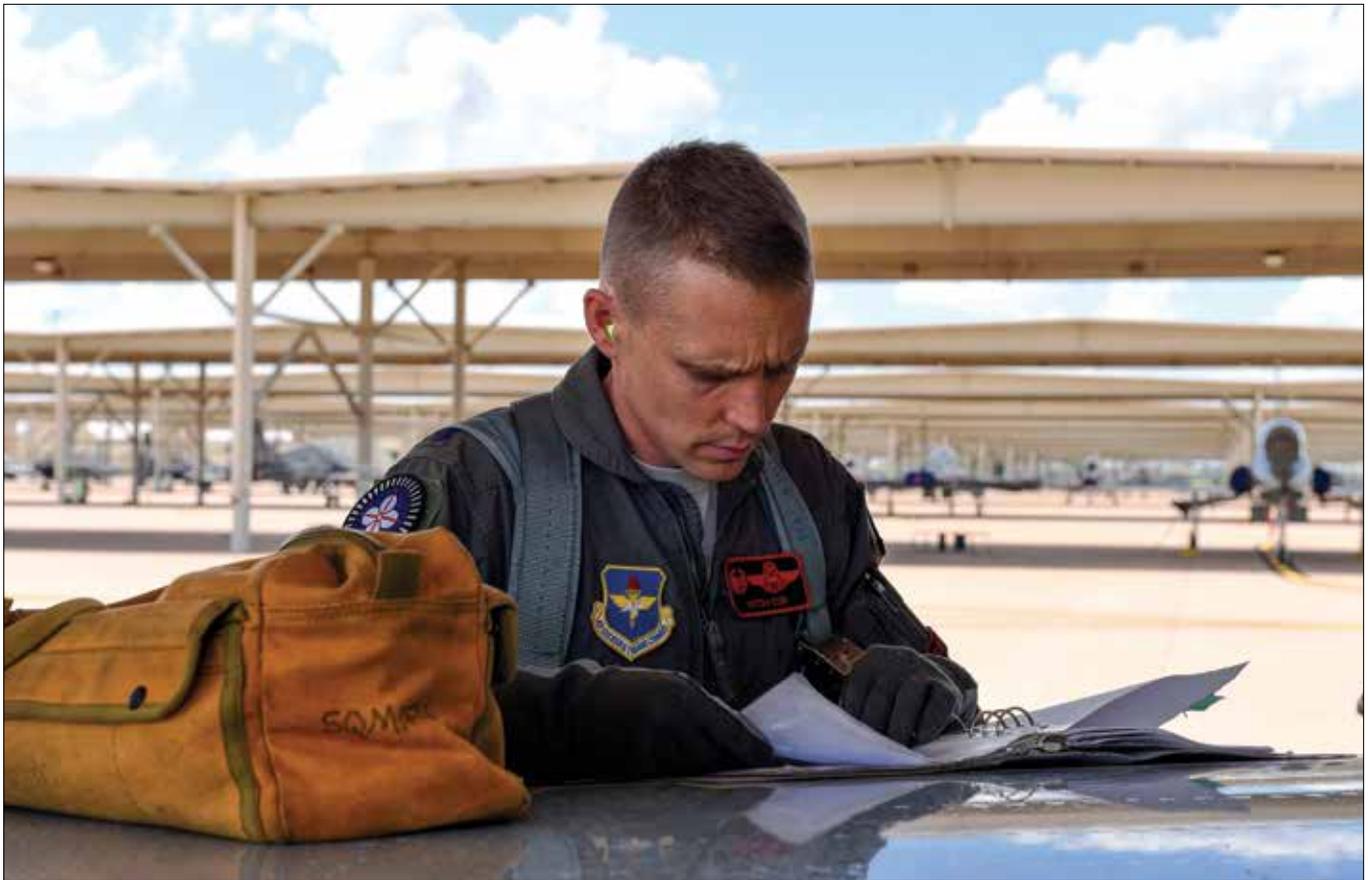
Two assumptions need to be challenged in light of leadership failures great and small as I continue to define the problem. The first is that all military officers possess positive inner character, and they maintain that ethos of shared values on their own throughout a career. Maybe some do, but such integrity of character is certainly not universal in the officer corps given the evidence that is before us. The second assumption is connected to the first. Because it is assumed military officers first possess and then secondly maintain positive inner character on their own, PME institutions can get by with minimal instruction on ethics using

didactic methods, rote learning, and a meta-ethic based on action/inaction. To counter these false assumptions, I describe the proper doctrinal and philosophical grounding of the profession of arms that PME should build its ethics education on.

Before doing so, a less obvious facet of the problem recently came to mind as the result of a conversation I had with a student. This student stated her belief that ethics has nothing to do with morals or morality, and later revealed that, for her, morality stemmed from religiosity. Her comment reflects a belief that may be more prevalent in the military mindset than I want to believe, and the conversation reminded me that we cannot make assumptions about the meaning of ethics in a pluralistic culture like the military.

A dictionary definition of the adjective *moral* describes it as relating to principles of right and wrong in behavior, or expressing or teaching a conception of right behavior.⁵ It is the community—in this case, the profession of arms for the military officers who attend PME institutions—that determines the principles of right and wrong. The adjective *just*, defined as acting or being in conformity with what is morally upright or good, could be somewhat of a synonym for moral. *Morality* is a moral discourse, statement, or lesson to members of the community, and it is closely connected to *justice*, which is the maintenance or administration of what is just or doing what is morally good. *Ethics* is defined as the discipline dealing with what is good and bad (what is moral), moral duty and obligation, and a set of moral principles or values. Acting or behaving in an *ethical* manner is simply “of or relating to ethics.”

Immediately, we can see that morals are clearly connected to ethics, and that nothing is stated about the necessity of having a religious source of determining what is good and, conversely, what is bad. We can also see that ethics, and thus morality, are connected to justice. All those concepts are interrelated; without one, we do not have the others, or they are so diminished or restricted as to not have any meaning at all. When that is the case, concepts like moral, ethical, and just are relative and self-serving. If the behavior



Lieutenant Colonel Mitchell Cok, 88th Fighter Training Squadron, recognized for Profession of Arms Center of Excellence Leadership Impact Award, goes over preflight check list before Introduction to Fighter Fundamentals training sortie at Sheppard Air Force Base, Texas, May 22, 2018 (U.S. Air Force/John Ingle)

of a military officer is immoral, that is to say, contrary to shared values of the profession of arms, then his or her behavior is also unethical and unjust. If, on the other hand, our individual choices, decisions, or lines of effort—all forms of human behavior—are moral, then they are by definition also ethical and just. It is an open question as to whether such a connection is conveyed to students in PME institutions. I am skeptical that those institutions have robust military ethics programs and thoughtfully consider the relationship between morality and ethics. Ethical education is not seen as grounded in military doctrine, and thus military ethics is a “nice to have” instead of a requirement for officer development.

Doctrinal Foundation for Virtue Ethics in the Profession of Arms

Joint Publication 1 (JP 1), *The Doctrine of the Armed Forces of the United States*, appendix B, “The Profession of Arms,” describes a professional as having both

competence *and* character. I begin with character instead of competence for two reasons. First, of the two components of the definition, character is largely ignored in military practice over a clear preference for competence.⁶ Secondly, JP 1 assumes that the word *character* is positive in and of itself, and this assumption needs correction. According to JP 1, “Character refers to the aggregate of personal features and traits that form the individual nature of a person.”⁷ Nothing in that definition, however, assumes one’s features and traits are always positive. As Aristotle put it:

For what we do in our dealings with other people makes some of us just, some unjust; what we do in terrifying situations, and the habits of fear or confidence that we acquire, make some of us brave and others cowardly. The same is true of situations involving appetites and anger; for one or another sort of conduct in these situations make some temperate and mild, others

intemperate and irascible. To sum up in a single account: a state [of character] results from [the repetition of] similar activities.⁸

Character refers to ingrained traits of an individual gained through process of socialization, and those traits then determine behavior. If such traits and behavior only lead to the betterment of the individual and/or his defined group, and not the general well-being of society or the community-at-large, then character takes on a negative connotation. In fact, character in this sense, and the behavior that stems from it, may clash with societal or communal values.

JP 1 describes adherence to shared values as “the heart of the relationship of the profession with the American people, and to each other.”⁹ For our ethos to have a positive meaning, and benefit others *outside* of the group as well as those *within* the group, members of the profession of arms must see themselves as connected to or in relationship with

the larger society they serve. Adherence to shared values of our society becomes a matter of rational and personal choices made over time, and they are chosen by individuals within the profession of arms because it is the right thing to choose.

What JP 1 is describing is *trust*. In his white paper while Chairman of the Joint Chiefs of Staff, General Martin Dempsey referred to two kinds of trust: an external trust we have with the citizens we serve as military professionals; and an internal trust we must have with each other within the military profession.¹⁰ Snider describes the necessity of trust by stating that it is the currency of a profession.¹¹ Stephen M.R. Covey describes why trust is the lifeblood of both a profession and a healthy society:

*There is one thing that is common to every individual, relationship, team, family, organization, nation, economy, and civilization throughout the world—one thing which, if removed, will destroy the most powerful government, the most successful business, the most thriving economy, the most influential leadership, the greatest friendship, the strongest character, the deepest love. On the other hand, if developed and leveraged, that one thing has the potential to create unparalleled success and prosperity in every dimension of life. Yet it is the least understood, most neglected, and most underestimated possibility of our time. That one thing is trust.*¹²

JP 1 connects competence with a nontechnical, but altogether necessary skill of developing and keeping trust: “Competent performance includes both the technical competence to perform a task to standard *as well as the ability to integrate that skill with others.*”¹³ Competence certainly involves technical abilities, and the assumed mentality to carry out those abilities, but PME largely ignores the deeper meaning of competence in JP 1 for reasons that have yet to be uncovered. Competence must also include the development of interpersonal skills in order to communicate with others, and such communication requires trust. Whether as a commander or a member of a staff, interpersonal skills *will* involve one’s behavior; behavior, then, is

the evidence of one’s inner character, and inner character is a matter for virtue ethics, which I address in the next section.

The Officer Professional Military Education Policy (OPMEP) is the other doctrinal foundation for ethical education. The OPMEP establishes the Officer Desired Leadership Attributes (DLAs).¹⁴ The DLAs trace back to a memorandum from the Chairman issued in June 2012, where General Dempsey defined the fifth DLA as “make ethical decisions based on the shared values of the Profession of Arms.”¹⁵ It should be evident that moral and ethical decisions of military officers should *not* be based solely on an outcome (a consequentialist framework), but yet that is one predominant ethical thrust in practice at the operational and tactical levels of the military, and on rare occasions even at the strategic level.

The OPMEP appendix A to enclosure A, “Officer Professional Military Education Continuum,” gives some guidance on the education of ethics, but the guidance there is a mixed message when it comes to the ethical education of military officers. In the overview of the appendix, the continuum is described as reflecting “the dynamic system of officer career education”¹⁶ and identifies and defines areas of focus at each educational level of a military career and provides joint curriculum guidance for PME institutions: “It is a comprehensive frame of reference depicting the progressive nature of PME, guiding an officer’s individual development over time.”¹⁷ Later in the appendix, PME is described as conveying “the broad knowledge and develop[ing] the habits of mind essential to the military professional’s expertise in the art and science of war.”¹⁸ The art of war includes “critical and reflective thinkers who broadly view military affairs across an array of academic disciplines.”¹⁹

What is lacking in the OPMEP is clear guidance about what role the education of ethics plays in the development of critical and reflective thinkers. Annex A to appendix A gives a graphic view of the continuum that assumes the DLAs, including DLA 5, is continued with equal intensity throughout an entire career—for general/flag officers as much

as for cadets/midshipmen. This image, however, is in contrast to the text of appendix A, where ethics of any sort is *not* mentioned as a focus of study for intermediate, senior, and general/flag officer levels of PME, and an education on core or shared values stressed in JP 1 is not in the text for *any* level of the continuum. It stands to reason that because ethics is not specified and mentioned in the text of the OPMEP’s appendix A, the education of ethics is not stressed in PME. An individual’s moral and ethical foundation and the habits he demonstrates as a member of the profession of arms are elements of the *art* of war, and why they are not being addressed at *all* levels of PME with equal intensity is at the heart of my critique.²⁰

JP 1 and the theoretical foundation of the OPMEP make it clear that a commitment to a decision or course of action is based on a set of shared values—what the ancient Greeks called cardinal virtues and the U.S. military calls core values. This assumes that military leaders both cognitively know and affectively show those core values each and every day regardless of rank, authority, or who is watching. This assumption, an addendum to the false assumptions above, must be challenged given the moral, ethical, and legal failures of junior and senior military personnel previously mentioned. What is important to note is that most moral and ethical failures within the military never make the headlines. They are occurring, perhaps on a daily basis, at all levels of command. Officers who enter a PME institution may not cognitively know and affectively show service core values. If these failures are not addressed in PME against the standard of core values, and if members of the profession of arms who have gone through some form of PME are not held visibly accountable for their behavior, or worse, their misconduct is overlooked because of status, rank, friendship, false loyalty, or ability to produce desired outcomes, then the ethos, trust, and morale of the unit, Service, or joint force suffers. As if that were not bad enough, our trust with the citizenry we serve, and those they elect to Congress, is severely damaged.



Army National Guard Specialist Marina Grage, 890th Engineer Battalion, Mississippi National Guard, takes part in obstacle course competition at Camp Butner, North Carolina, during Region III Best Warrior, May 15, 2019 (U.S. Army National Guard/William Frye)

Philosophical Foundation for Virtue Ethics in the Profession of Arms

PME's lack of address on the ethical failures of military officers is also due to prevailing ethical frameworks at work in the military, which are not concerned about inner character and shared values. The Enlightenment brought those streams of ethical thought into being, and the most well-known ethical theories from this period used in military ethics today are Immanuel Kant's ethics of duty (deontology) and Jeremy Bentham's utilitarianism (a corporate form of consequentialism that I have already mentioned above).²¹

Philosophical thought during the Enlightenment was dominated by rational thought and scientific approaches to problems in several disciplines, including ethics; hence, it is called the Age of Reason. As a result, affections or emotions were not trusted and thus marginalized, or they were eliminated from ethical

thinking altogether. Deontology and utilitarianism utilize a meta-ethic on action in addition to an emphasis on reason. In other words, the rightness and wrongness of the situation depend on the nature or consequence of the act, depending on which framework one is using. As a result, those theories abstract the individual from said act. An over-emphasis on rational thought, and the consequential elimination of affections within ethics, leads to a training mentality and insistence that ethics can be taught using didactic classroom methods. It also assumes that ethics can be learned by rote and evaluated on written tests rather than by experience.²²

Over 2,000 years before the Enlightenment, Aristotle taught a different understanding of ethics based on the morality of the person rather than the nature or consequence of the act. Referring back to the definitions I shared when defining the problem, our sense of faithfulness to the well-being of the community (what they called *eudaimonia*, or what I am referring to as morality) is

tightly linked to our ability to put things right or do the right thing in our individual behavior within that community (*ethos* or ethics).²³ Aristotle defined the virtue of the moral actor in two ways: virtue of thought and virtue of character:

*Virtue of thought arises and grows mostly from teaching; that is why it needs experience and time. . . . Hence, it is also clear that none of the virtues of character arises in us naturally. . . . Rather, we are by nature able to acquire them, and we are completed through habit.*²⁴

To acquire intellectual virtue, or virtue of thought as Aristotle put it, a community (*polis*) must invest time in its members, and those members must be willing to "experience" the process of Socratic instruction.²⁵

Though informed by reason, Aristotle also acknowledged the role of affections in moral life, and this is carried forward by modern neo-Aristotelians. This balanced approach, using both cognition

and affection, is the key difference from the ethical theories of the Enlightenment and a missing element in ethical instruction in PME. Emotions are connected in powerful ways to our dispositions or our informed states of character. The avoidance of emotion leaves us well-disposed to vice or the corruption of virtue. If well-disposed to vice, then our choices and resulting behavior will not reflect virtue of character. Robert Roberts and W. Jay Wood argue that “for the knower to function properly as a knower, his will, especially as a source of emotions or affections, needs to be shaped and completed to form such . . . virtues as charity, fairness, intellectual honesty, love of knowledge (truth), perseverance, openness, caution, boldness, and humility.”²⁶

While Aristotle suggested that virtue of character can be modeled and experienced—and thus taught—within a community, he also made it clear that the individual bears responsibility for making virtue of character a habit in order to demonstrate moral behavior. If people lack integrity, honesty, trustworthiness, they have only themselves to blame if immoral and unethical behavior gets them in trouble because they have chosen not to not practice integrity, honesty, trustworthiness.²⁷ Aristotle put it this way:

*Virtues, by contrast, we acquire, just as we acquire crafts, having first activated them. For we learn a craft by producing the same product that we must produce when we have learned it; we become builders, for instance, by building; and we become harpists by playing the harp. Similarly, then, we become just by doing just actions, temperate by doing temperate actions, brave by doing brave actions.*²⁸

In the same manner, we develop trust within the profession of arms and with the citizens we serve by being trustworthy in *both* our public and private lives.

Former Secretary of Defense James Mattis alludes to a meta-ethical focus on the military officer as a moral actor, the framework of virtue ethics, and the importance of internal and external trust in a memorandum released on August 4, 2017: “Those entrusted by our nation

Table. Examples of Aristotle’s “Doctrine of the Mean”

Vice of Deficiency	Virtue of Character	Vice of Excess
Ignorance	Prudence	Manipulation
Asceticism	Temperance	Hedonism
Cowardice	Courage	Foolhardiness

with carrying out violence, those entrusted with the lives of our troops, and those entrusted with enormous sums of taxpayer money must set an honorable example in all that we do.”²⁹ Secretary Mattis echoes and accentuates JP 1 and the theoretical foundation of the OPMEP by stressing the need for virtue of character. General Dempsey stated the same sentiment in 2012: “If we really are a profession—a group of men and women who are committed to living an uncommon life with extraordinary responsibilities and high standards—we should want to figure it out before someone else figures it out for us.”³⁰

Within the memorandum, the Secretary also uses a simple metaphor to describe his ethical approach—one he states that all within the Department of Defense must follow:

*I expect every member of the Department to play in the ethical midfield. I need you to be aggressive and show initiative without running the ethical sidelines, where even one misstep will have you out of bounds. I want our focus to be on the essence of ethical conduct: doing what is right at all times, regardless of the circumstances or whether anyone is watching. . . . Our prior reflection and our choice to live by an ethical code will reinforce what we stand for, so we remain morally strong especially in the face of adversity.*³¹

The Secretary is describing a military profession that demonstrates virtue of character, or, as he puts it, one that plays in the ethical midfield. That is precisely what Aristotle argued centuries ago in his doctrine of the mean. Vice, as moral depravity or corruption, exists on either of two extremes: one of excess of a given character trait (“too much of a good thing,” as the saying goes) or one of deficiency of that same trait. The table gives examples using

three of the ancient Greek cardinal virtues. The similarities of ethical approaches between Aristotle and the Secretary are striking. For Aristotle, virtue of character is found in an ethical mean; for Mattis, it is found in the ethical midfield.

There is an internal tension when living in the virtuous midfield as forces of vice pull us toward one sideline or the other, and that tension is something that a meta-ethic on action cannot address. Consequently, it does not get addressed in current ethical education within PME. This is the case because the dissonance is affective as well as cognitive, and the Enlightenment theories mentioned herein will not address the affective domain of learning. The tension, and the maturity that comes by dealing with that tension, is never relieved simply by classroom teaching, reaching a certain age, or obtaining a particular status in the profession. That ethical tension and emotional and cognitive dissonance do not magically go away; they must be internally examined by looking at one’s character and choices of behavior and then externally sharing those realizations in experiential learning in order to keep oneself in the ethical midfield. An occupational military training approach to the education of ethics will not give students the time in a structured educational environment to analyze that tension, understand their personal ethical constitution, and realize how their behavior affects others.

There is another reason maintaining an ethical balance, or staying in the ethical midfield, is difficult, and it is a factor that, again, PME does not take into consideration. Grady Scott Davis writes:

What is less frequently recognized is that the virtues of human character are, of their nature, fragile. This fragility is not an unfortunate happenstance but an essential aspect of what it means to be a



Air Force General Paul J. Selva embraces surviving family member after Tragedy Assistance Program for Survivors Grand Banquet at 23rd TAPS National Military Survivor Seminar and Good Grief Camp in Arlington, Virginia, May 27, 2017 (DOD/James K. McCann)

*virtue. For virtues are always begging [to be] tested, and they frequently require reaffirming our resolve and reminding ourselves of where our true love lies. There is no rest in the past achievements of virtue, any more than there is for the competitive athlete or concert musician. Like any other skill or art, it will weaken and eventually vanish if not regularly employed. The most common enemies of virtue are indifference, self-indulgence, and despair, which persuades someone that something needn't be done, or not just now, or can't possibly be accomplished anyway.*³²

It is hard work to stay in the ethical midfield, and PME has a key role in providing the intellectual and professional white space to find an ethical center of gravity (COG)—a concept I have borrowed from my joint PME education and described in other essays as the inward or spiritual ability to maintain a

virtuous mean.³³ Bruce Birch and Larry Rasmussen explain why a meta-ethic focused on the moral actor, and virtue ethics as the predominant theory of ethical instruction, is important in education as a whole and PME in particular:

*Vexing moral problems and innumerable issues of social justice arose for the ancient Greeks, of course, as they have for every people. Yet the work of morality was directed less to the resolution of moral quandaries (“what would you do if . . .”) than to deliberation of how we should live, with special concern for the sorts of persons we should be. This side of the moral life brings moral formation to the fore and accentuates moral education and training for the good life as key elements of ethics. The formation and ordering of society [are] crucial in this, since society is both the tutor and the living environment of morality. Society is both the teacher and classroom for character formation.*³⁴

William F. May puts it more bluntly: “[The] field of ethics does not reduce to the utilitarian concern for producing good. Ethics must deal with virtues as well as principles of action, with *being* good as well as *producing* good.”³⁵

Results were important to the ancient Greeks, as they certainly are for modern institutions like the military, but those outcomes should not ignore or passively degrade the ethos and morale of the individuals who embody the institution in order to achieve particular outcomes. PME has a role to play in correcting the meta-ethical approach to the education of ethics. When the meta-ethical question changes to what kind of officers we should become, and ethical education addresses that internal development, then moral and ethical conduct as virtuous members of the profession of arms and of society should naturally follow.³⁶ John Maxwell writes, “Our character

represents who we are on the inside. And the good news is that if you focus on being better on the inside than on the outside, over time you will also become better on the outside.³⁷ That is the proactive and timeless approach of virtue ethics. It is the difference between ounces of prevention, which focus on the morality of the actor, and pounds of cure, which focus on immoral, unethical, or illegal action. If military officers are *not* willing to be *both* involved in the reinforcement, recalibration, or replacement of their moral compass *and* exhibit the virtue of character as Aristotle taught, then their choice says everything about what kind of character they possess—and their view of military service as a job rather than as a profession.

Intellectual Humility and Civic Virtue in the Profession of Arms

The ability to stay in the ethical mid-field through a clear understanding of the profession's values as they relate to one's own values requires another cardinal virtue that has received recent review. *Intellectual humility* has the flexibility to address fluid and complex situations facing military leaders and planners today and is a key component to civic virtue—the trust we have with the citizens we serve.³⁸

Humility is the state of *not* being proud, haughty, assertive, or rude. The definition does not suggest a sense of weakness or passivity that is usually associated with the virtue. Rather, it suggests that humility is the strength to resist an impulsive reaction to external stimuli and, at the same time, a refusal to submit to the reactions of others. In other words, humility is an Aristotelian mean or virtuous balance between the vice of *arrogance*, a deficiency of humility, and the vice of *timidity*, or excess of humility. When one is arrogant, he thinks too highly of himself and ceases to listen to others. He then becomes close-minded, perhaps tyrannical, and exhibits a serious lack of ethical wisdom by not heeding the advice of others around him, including those in subordinate positions. Such officers, to some degree or another, too often step out of bounds morally and ethically.

On the other extreme, a timid person thinks too little of herself. Such a person runs the risk of listening to too many voices around her, particularly those who are the loudest, the most influential, or the last one to have her ear. When the vice of timidity is in play, there is a lack of moral courage to state original thoughts and sentiments, stand one's moral ground, and propose unpopular alternatives, especially in the presence of intimidating personalities and/or groupthink dynamics.

Combining the character trait of humility with the adjective *intellectual* is in keeping with the virtues Aristotle put forth many centuries ago and gives humility a needed dimension that is missing in common, and less positive, interpretations of the virtue in religious and philosophical discourse. Taken together, intellectual humility conveys an emotional strength and rational capability in order not to be arrogant in our interactions with others, both in and out of uniform and, in the same moment, not lose integrity and be subverted by others in the interpersonal dynamics of groupthink and intimidation. Intellectual humility is also open-mindedness to other perspectives, even those that are different from the viewpoints and values one firmly holds. Even in disagreement, intellectual humility conveys a moral courage to say to oneself and others, "That is a valid point; let's discuss it more," "I was wrong and need to approach the issue differently," or "With all due respect, I disagree, and here is why."

Intellectual humility is a state of being that is in the ethical mid-field that Secretary Mattis stressed in his memo. Those who possess and demonstrate intellectual humility can see value in disagreement and leverage the ensuing discussion as a means of seeking the best solution.³⁹ This is in stark contrast to those who see disagreement with their perspective, opinion, or assessment as an insult—or worse, as a threat. It is more than fair to say that nobody wants to work with, or for such individuals. While not specifically mentioning intellectual humility, Dallas Willard alludes to it as he describes a reasonable person:

The main point in all of this, to my mind, is simply that the reasonable person—the one who acts in accordance with reason in life as well as in their academic or other profession—is the one who governs his or her beliefs and assertions by insight into truth and logical relations. In particular, they are not mastered by how they want things to be, by the beliefs they happen to have, or by styles or currents of thought and action around them. If they advance claims as true or justified they do so on a basis of such insight, and are very careful to be sure that that basis is really there. The difficulty of securing such a basis will make any reasonable person quite humble in their claims and willing (indeed, happy, even solicitous) to be corrected when they are mistaken. Thus the reasonable person is not close-minded or dogmatic, or insistent on having their own way, but just the opposite.⁴⁰

Willard's description also describes someone who possesses civic virtue. Robert Audi describes civic virtue and ties it back to our earlier discussion of the virtue of character:

Virtuous citizens . . . try to contribute in some way to the welfare of others, including others beyond their immediate community. In a society that is complex, pluralistic, and so, inevitably, somewhat divided, civic virtue implies trying to take reasonable positions on important issues, voting, discussing problems with others, and more. Civic virtue in a liberal democracy implies a degree of responsible political participation. . . . I would stress that insofar as we are thinking of the advocacy or other public behavior as supposed to be action from virtue, we should look not just at what kind of act it is and what can be said for it abstractly, but also at how it is grounded in the agent's character.⁴¹

Summary

Training in the military is necessary, but it is singular in focus—preparing Servicemembers to do specific things in specific contexts and for a specific reason. Professional military education should be much more encompassing than occupational military training. It must involve a multidisciplinary



U.S. Army Specialist Emma Archut, 328th Military Police Company, winces in pain from shoulder spasms after completing timed 12-mile ruck march during New Jersey National Guard's Best Warrior Competition, April 11, 2019 (U.S. Air National Guard/Matt Hecht)

approach to topics, including those, like ethics, *not* directly related to achieving some defined outcome or product. Within PME, however, the processes of training and education are confused at the risk of becoming synonymous, and the width and depth of military study in general and the education of ethics in particular suffer as a result.

If PME is a process of achieving milestones in an individual's military career without reinforcing, or perhaps fundamentally changing the moral constitution of a given officer, then it is ignoring clear strategic direction. Perhaps this is the condition to which Secretary Mattis refers in the National Defense Strategy:

PME has stagnated, focused more on the accomplishment of mandatory credit at the expense of lethality and ingenuity. We will emphasize intellectual leadership and military professionalism in the art and science of warfighting, deepening our knowledge of history while embracing new technology and techniques to counter competitors. PME will emphasize independence of action in warfighting concepts to lessen the impact of degraded/lost communications in combat. PME is to be used as a strategic asset to build trust and interoperability across the Joint Forces and with allied and partner forces.⁴²

To move beyond just getting a military education for what Mattis called “mandatory credit,” JP 1 clearly dictates educational instruction on virtue ethics in PME across the entire continuum of a military career, with the goal of producing military professionals who possess independence of thought and action through intellectual humility and thus build trust in whatever billet they fill. That, it seems, is what the Secretary desires. Voluntary adherence to core values, and a relationship of trust with each other and the American people through our oath to the Constitution, separates a highly qualified military *technician* with high rank from a military *professional* of any rank who can fully comprehend and apply what it means to be a member of the profession of arms. Consequently, I have suggested that virtue ethics is the philosophical foundation of the profession of arms and not Enlightenment theories currently in place.

To accomplish the educational mission that is being demanded by Secretary Mattis and PME doctrine, a review of the ethical education based on virtue of character is necessary while the current OPMEP is under revision. Don Snider states why this must take place: “The current scope of moral corrosion from the

past decade of war shows that our services have taken for too long a *laissez faire* approach to the development of the moral character of our warriors. Our forces are superbly trained and equipped, but in the moral domain the recent record shows they are far weaker than their leaders believe.”⁴³

In the *Apology*, Socrates claimed to be wiser than other men not because of what he knew but rather because of what he did *not* know. Many of the Socratic dialogues, in fact, end in uncertainty, and the characters in those dialogues reacted to that uncertainty in different ways—some well, others not so well.⁴⁴ The aim of PME then should be to give military officers the educational and ethical white space within any given curriculum to think critically, seek out what they do *not* know with intellectual humility and civic virtue, and react to uncertainty with an affective internalization of military core values in conjunction with other skills gained through PME in order to find solutions to current and complex problems. JFQ

Notes

¹ Don Snider, “The Military Profession of the Future,” U.S. Naval War College lecture, December 2016, available at <www.youtube.com/watch?v=hZEtR_F-NRO>.

² My use of the acronym *PME* in this chapter includes joint PME (JPME).

³ Joseph S. Nye, Jr., is credited with coining the term *soft power* in 1990 in his book *Soft Power: The Means to Success in World Politics* (New York: PublicAffairs, 2004). He described how a nation state like the United States could use soft power to frame relationships with other nation-states, and he argued that soft power is more effective in the long term in the geopolitical world over and against hard or kinetic power. I have borrowed his concept but applied it to interpersonal relationships—in particular, that of a leader to subordinates rather than relationships between nation-states.

⁴ There is a spectrum of ethical failure—most of which does not make the news but is equally damaging to the morale of a unit. Some, maybe most, of these failures are captured in Department of Defense (DOD), Standards of Conduct Office, *Encyclopedia of Ethical Failure* (Washington, DC: DOD, updated October 2014). None of the cases in the encyclopedia involve dereliction of duty or incompetence, only behavior based in a poor or nonexistent grasp of personal virtue. Many

more cases from the past 3 years could be added. For one Service's account of moral and ethical failure, see Mark Light, "The Navy's Moral Compass: Commanding Officers and Personal Conduct," *Naval War College Review* 65, no. 3 (Summer 2012). Captain Light is a member of the Department of Command, Leadership, and Management at the U.S. Naval War College.

⁵ The definitions in this paragraph come from *Webster's New Collegiate Dictionary*.

⁶ John Maxwell puts it like this in his book *How Successful People Grow: 15 Ways to Get Ahead in Life* (New York: Center Street, 2014): "Most people focus too much on competence and too little on character" (76). My thesis is that the same is true in PME.

⁷ Joint Publication (JP) 1, *The Doctrine of the Armed Forces of the United States* (Washington, DC: The Joint Staff, March 25, 2013, incorporating Change 1, July 12, 2017), B-1.

⁸ Aristotle, *Nicomachean Ethics*, trans. Terence Irwin, 2nd ed. (Indianapolis: Hackett Publish Co., 1999), 19.

⁹ JP 1, B-1.

¹⁰ Martin Dempsey, *America's Military—The Profession of Arms* (Washington, DC: The Joint Staff, February 23, 2012), available at <www.jcs.mil/Portals/36/Documents/Publications/aprofessionofarms.pdf>. General Dempsey was the Chairman of the Joint Chiefs of Staff (CJCS) at the time. His paper directly parallels JP 1.

¹¹ Snider, "The Military Profession of the Future."

¹² Stephen M.R. Covey, *The Speed of Trust* (New York: Free Press, 2006), 1.

¹³ JP 1, B-1. Emphasis added.

¹⁴ CJCS Instruction 1800.01E, *Officer Professional Military Education Policy* (OPMEP) (Washington, DC: The Joint Staff, May 29, 2015), paragraph 7, "Summary of Changes," § e, available at <www.jcs.mil/Portals/36/Documents/Library/Instructions/1800_01a.pdf>.

¹⁵ Martin E. Dempsey, "Desired Leader Attributes for Joint Force 2020," CJCS Memorandum for Chiefs of the Military Services; Commanders of the Combatant Commands; Chief, National Guard Bureau; and Directors of the Joint Staff Directorates, CM-0166-13, June 28, 2013, available at <www.ndu.edu/Portals/59/Documents/BOV_Documents/2014/CJCS%20Joint%20Education%20Review%20Implementation%20Memo%20only.pdf>.

¹⁶ CJCS Instruction 1800.01E, enclosure A, A-1.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ It is an intellectual curiosity that the current OPMEP, with its lack of direction on the instruction of ethics and core values, was written after General Dempsey's white paper on profession of arms.

²¹ Jeremy Bentham's work on utilitarian-

ism—seeking what is best for "us"—was further developed in the 19th century by a more well-known proponent of the theory, and follower of Bentham, John Stuart Mill. An individual form of consequentialism is psychological and ethical egoism—both proposing that morality is found in what is best for "me" by denying that altruism exists.

²² One-third of my career as a military chaplain (6 years) has been spent in the Navy Chaplain Corps program Chaplains Religious Enrichment and Development Operation. The model used in the program's resilience retreats and workshops is experiential learning using dyad, triad, and small group discussion.

²³ N. Thomas Wright, "Letter to the Romans—Introduction," in *The New Interpreter's Bible*, ed. Leander E. Keck, vol. X (Nashville: Abingdon, 2002), 404. Writing as a theologian, Wright states that the Reformation as well as the Enlightenment separated *righteousness* (covenant faithfulness, morality, theology) from *justice* (putting things right, ethics, politics), to which I add that we have since institutionalized that separation and lived with the negative consequences in human interaction.

²⁴ Aristotle, *Nicomachean Ethics*, 18.

²⁵ Another key word in Aristotle's definition is *habit* or the continual practice of the virtue of character in one's life, and the importance of that part of the virtue of character I address in this chapter's summary.

²⁶ Robert C. Roberts and W. Jay Wood, "Proper Function, Emotion, and Virtues of the Intellect," *Faith and Philosophy* 21, no. 1 (January 2004), 21–22.

²⁷ Unfortunately, some do not accept responsibility. M. Scott Peck described such individuals as *character disordered*. Unlike neurotics who take on too much responsibility, he writes, character disordered individuals do not take on too little responsibility. In short, they blame their problems on someone or something else, and never take responsibility for the consequences of their actions.

²⁸ Aristotle, *Nicomachean Ethics*, 18.

²⁹ James N. Mattis, "Ethical Standards for All Hands," Memorandum for All Department of Defense Employees, August 4, 2017, available at <<https://dod.defense.gov/Portals/1/Documents/pubs/Ethical-Standards-for-All-Hands-SecDef-04-Aug-17.pdf>>.

³⁰ General Dempsey as quoted by Don Snider in "The Moral Corrosion Within Our Military Professions," lecture given at the Strategic Studies Institute, U.S. Army War College, November 27, 2012, available at <<https://ssi.armywarcollege.edu/index.cfm/articles/The-Moral-Corrosion-within-Our-Military-Professions/2012/11/27>>.

³¹ Mattis, "Ethical Standards for All Hands."

³² Grady Scott Davis, *Warcraft and the Fragility of Virtue: An Essay on Aristotelian Ethics* (Moscow: University of Idaho Press, 1992), 85.

³³ For the sake of brevity, one's inner or

spiritual center of gravity is not dependent on a religious belief system. I free the concept from that domain where now it simply involves all the intangible, untouchable aspects of being human that are centered on one's emotional center (heart, gut) and cognitive center (mind). Thus understood, spirituality is something *all* human beings have; it then becomes a matter of what is not allowing a person to think or feel in harmony with others around him. Spirituality is the necessary counterbalance to our physicality or physical aspects that are centered on our bodies and our environment, but one affects the other, sometimes in profound ways.

³⁴ Bruce C. Birch and Larry L. Rasmussen, *Bible and Ethics in the Christian Life*, rev. ed. (Minneapolis: Augsburg, 1989), 45.

³⁵ William F. May, "The Virtues in a Professional Setting," *The Annual Journal of Christian Ethics* 4 (1984), 71–91, available at <www.jstor.org/stable/23559367>.

³⁶ There are always exceptions to any rule, so it stands to reason that even if professional military education adopts this approach to the education of ethics, there is no guarantee that there will not be moral and ethical failure. What I hope is that the trend of moral, ethical, and legal failure I have mentioned will show a downward direction over time.

³⁷ Maxwell, *How Successful People Grow*, 77.

³⁸ I first saw the concept of intellectual humility in Nick Romeo's article, "Platonically Irrational," *Aeon*, May 15, 2017, available at <<https://aeon.co/essays/what-plato-knew-about-behavioural-economics-a-lot>>. Romeo does not define the concept, but ample peer-reviewed research is available on intellectual humility.

³⁹ Tim Alberta, "Americans Are Being Held Hostage and Terrorized by the Fringes," *Politico*, May 13, 2018, available at <www.politico.com/magazine/story/2018/05/13/arthur-brooks-american-enterprise-institute-interview-218364>. At the time of the writing, Arthur Brooks was the outgoing president of the American Enterprise Institute.

⁴⁰ Dallas Willard, "How Reason Can Survive the Modern University: The Moral Foundations of Rationality," in *Faith, Scholarship, and Culture in the 21st Century*, ed. Alice Ramos and Marie I. George (Washington, DC: Catholic University of America Press, 2002), 185.

⁴¹ Robert Audi, "Liberal Democracy and Religion in Politics," in *Religion in the Public Square: The Place of Religious Convictions in Political Debate*, ed. Robert Audi and Nicholas Wolterstorff (Lanham, MD: Rowman and Littlefield, 1997), 16, 32–33.

⁴² *Summary of the 2018 National Defense Strategy of the United States: Sharpening the American Military's Competitive Edge* (Washington, DC: Department of Defense, 2018).

⁴³ Snider, "The Moral Corrosion Within Our Military Professions."

⁴⁴ Romeo, "Platonically Irrational."



Marines from Company G and Company E, 2nd Battalion, 9th Marines, being interviewed pier side following rescue operation of merchant vessel SS *Mayaguez*, May 20, 1975 (Gerald R. Ford Presidential Library)

The *Mayaguez* Incident

A Model Case Study for PME

By Gregory D. Miller

Many Americans are familiar with the basic facts of the Cuban Missile Crisis, a case that is canon in many military institutions and civilian programs that teach history, political science, or decision-making. This article contends that the *Mayaguez* Incident (May 12–15, 1975) is an even more useful case, and all levels of professional military education (PME) should incorporate it

into the curriculum. Despite existing scholarship on the *Mayaguez*, it is not a particularly well-known case among decisionmakers, and less so among the public. Even at the war college level, too many students are unaware of the 1975 event, much less the details that make it such a valuable case study. This does not suggest eliminating the Missile Crisis study, but the challenges and lessons of the *Mayaguez* Incident should be just as familiar to senior military and civilian decisionmakers.

This article highlights the critical elements of the case, intended as an instructor's supplemental guide. It

highlights the value of a thorough historical education, as well as the danger of too much distance between the strategic and operational levels. Despite the President's ability to micromanage at the tactical level, the lack of understanding between the strategic leader and operational planners almost resulted in a more significant crisis.

This article is organized according to the three core courses in the Joint Advanced Warfighting School (JAWS) curriculum, though this information is applicable to all military institutions. The main sections below examine the relevance of the case for the study of history, strategy, and operational planning.

Dr. Gregory D. Miller is an Associate Professor of Leadership Studies at the Air Command and Staff College.

The article concludes with some final thoughts about the case, intended as questions for seminar discussion and for future research.

Background

Some consider the *Mayaguez* to be the last battle of the Vietnam War, and those who died during the operation are part of the Vietnam War Memorial in Washington, DC.¹ The final U.S. withdrawal from Vietnam on April 29–30, 1975—just 2 weeks prior to the *Mayaguez* Incident—certainly influenced how the National Command Authority perceived both the crisis and the need to respond quickly and with force. Because there are already several detailed accounts of the crisis, this section provides a brief overview of the main events and decisions.²

On May 12, 1975 (at roughly 0318 EST), the SS *Mayaguez*, a U.S. container ship, was seized off the coast of Cambodia. U.S. officials believed initially that Khmer Rouge forces were moving the ship and the 40-person crew to Kompong Son, a port on mainland Cambodia. Later, during the rescue operation, U.S. officials believed both were on Koh Tang, an island 32 miles off the coast of Cambodia.

President Gerald Ford learned of the situation at his morning briefing. At noon, roughly 9 hours after seizure of the ship, he convened the first of four National Security Council (NSC) meetings before he approved the military plan. Military operations began at 1700 EST on May 14 and involved the USS *Holt* securing the ship and Marines landing on Koh Tang to occupy the island and rescue the crew. Because there were not enough helicopters to deliver all the Marines at one time, the operation required three waves of helicopters from Thailand. However, it was a 4-hour round trip, meaning the first one-third of the planned force would be on its own until the next wave arrived 4 hours later.

Immediately upon landing on Koh Tang, the Marines encountered heavy resistance, as much as five times larger than anticipated. The expected pre-landing strikes did not occur out of concern

that they would endanger the crew, still believed to be on the island. Of the 11 helicopters in the first wave, only 4 were available to bring in the second wave due to both mechanical issues and taking enemy fire. When the second wave did arrive, it delivered fewer than half the Marines as originally planned.

Less than 20 minutes after the first wave of Marines landed, the Cambodians released the crewmembers, none of whom was on Koh Tang. The USS *Holt* arrived and found the *Mayaguez* empty, and it began towing the ship away from Koh Tang. Because of the rescue of the ship and crew, President Ford canceled the third wave of Marines and tasked the remaining helicopters with extracting more than 200 Marines from the island, although this took more than 5 hours. In the confusion of the extraction, three Marines were left behind and are presumed to have been captured and executed.

The operation ended with the crew and ship rescued, but with 41 U.S. Servicemembers dead and three helicopters destroyed. Upon completion of the operation, the Ford administration saw a temporary increase in public opinion and an enhanced U.S. reputation with its allies. Despite being a political and strategic win, the operation was rife with flaws, and this contrast is one reason it is such a valuable case study for future decisionmakers.

Theory and History

There is often a tension within PME over what to teach, and many see history as easily replaced with topics that are more valuable, or more “timely,” such as counterinsurgency after 2004, or great power competition after 2018. What the *Mayaguez* case does, even more than the Cuban Missile Crisis, is illustrate why an accurate use of history is so important for senior leaders.

Lack of awareness over the *Mayaguez* Incident is particularly troubling considering the poor use of history by strategic decisionmakers during the crisis. The case itself is a valuable lesson in history, coming as it does on the heels of the Vietnam War and in a transition point of the Cold

War. And the poor use of historical analogy by President Ford’s advisors makes it particularly valuable for students.

The Historical Context: Cold War vs. Local Conflict. It is important to understand the strategic environment surrounding any historical study. This historical context puts the case in perspective and is helpful for understanding the mindset of the decisionmakers, particularly President Ford and the NSC.

Gerald Ford had been President for only 8 months since Richard Nixon’s August 1974 resignation, and the country was still reeling from Watergate and the Vietnam War. Ford had yet to be tested on foreign policy, and he wanted to show himself to be capable of making difficult decisions. He retained many of Nixon’s advisors, most notably Henry Kissinger serving as both Secretary of State and National Security Advisor,³ and Secretary of Defense Arthur Schlesinger. Ford also faced a minor crisis of legitimacy. He was not Nixon’s first Vice President, but took over when Spiro Agnew resigned over tax evasion. Thus, Ford was the first unelected President of the United States.

Regionally, on April 17, 1975, Cambodia fell to the Communist Khmer Rouge. Two weeks later, Saigon fell to the North Vietnamese, and the United States fully withdrew from Vietnam as part of Operation *Frequent Wind*. The United States still generally viewed all communists as part of a unified bloc, but what the NSC did not know at the time of the *Mayaguez* Incident was that Cambodia ramped up its defense of Koh Tang after the fall of Saigon out of fear of growing Vietnamese power. While the Khmer Rouge shared a communist ideology with the North Vietnamese, both groups were nationalistic and in competition with one another over a variety of issues, including the islands near where the Cambodians seized the *Mayaguez*.

Globally, the Cold War was still in a period of relative détente, especially after the opening of U.S. relations with China in February 1972 and the signing of the Strategic Arms Limitation Talks agreement and Anti-Ballistic Missile Treaty with the Soviets in May 1972. But there



Section of negative contact sheet for White House Photography Office roll A452 includes President Gerald Ford, Chief of Staff Donald H. Rumsfeld, Secretary of State Henry Kissinger, Central Intelligence Agency Director William Colby, Secretary of Defense James R. Schlesinger, and Vice President William Rockefeller, on day 3 of *Mayaguez* discussions, May 1975 (David Kennerly/Gerald R. Ford Presidential Library)

was still Cold War competition. The Southeast Asia Treaty Organization was falling apart after France's June 1974 withdrawal,⁴ and communists took over in Ethiopia in September 1974. The Ford administration was also concerned by reports that North Korea sought support from China and the Soviet Union for some type of military action against South Korea.⁵ This weighed heavily on U.S. decisionmakers during the crisis.

The Use of Analogy: Bad History Leads to Bad Decisions. Historians are fond of saying that history does not repeat itself, but it often rhymes. This is an important sentiment because it suggests that while no two cases are identical, we can apply lessons from history to modern events. The challenge is to know when

and how to apply these historical analogies effectively.⁶

The most pressing analogy that the NSC used during the discussions is the USS *Pueblo* case 7 years prior, in which North Korea seized a U.S. intelligence vessel and held the crew for 11 months. Ford's advisors brought up the 1968 incident on multiple occasions. Vice President Nelson Rockefeller was the first to use the analogy, simply offering, "I remember the PUEBLO case." Schlesinger later said, "It is like the PUEBLO. Once it got to Wonson [a port city in North Korea] it was hard to bring it back."⁷

Both cases involved the seizure of a U.S. ship and its crew, but that is where the similarities end. The *Pueblo* was a military ship, engaged in intelligence gathering in North Korean waters during

what was technically still a state of war between the United States and North Korea. In contrast, the *Mayaguez* was a commercial ship, and it is still unclear where it was seized and whether it was even flying an American flag at the time of its seizure,⁸ meaning the Cambodians might not have realized they were seizing an American ship.

The use of the *Pueblo* analogy is understandable if Ford's advisors were concerned about North Korean activities. But frequently drawing that comparison without addressing the key differences negatively influenced the decision. Using the *Pueblo* analogy placed an unwarranted time constraint on Ford. Rather than work to resolve the situation and get the crew and ship back, the President felt he needed to act before the crew reached the

mainland (without knowing where the crewmembers were or whether they were being moved to the mainland). This self-imposed time constraint then increased the likelihood of groupthink. In fact, it is not clear that this situation needed to rise to the level of a crisis, but the NSC approach from the beginning created a sense of urgency.

Another flawed analogy used in the NSC meetings was the Cuban Missile Crisis. Ford's Counselor to the President, Robert Hartmann, referenced Cuba during the third NSC meeting of the crisis (the second meeting on day 2), not because of parallels between the cases themselves, but to highlight the need to resolve the incident successfully, to give Ford a foreign policy win. Hartmann stated, "This crisis, like the Cuban missile crisis, is the first real test of your leadership. What you decide is not as important as what the public perceives."⁹ Comparing the seizure of a ship in Cambodia to the removal of Soviet missiles from Cuba created additional pressure on Ford to resolve the issue in a way that created a significant political win.

While history can be a persuasive tool, its incorrect use is dangerous because flawed analogies based on a poor understanding of the current context can lead to poor decisionmaking. Given that many of Ford's advisors were around during the *Pueblo* incident, the use of the analogy is both understandable, and perhaps less forgivable, since they should have been aware of the differences.

Strategy

JAWS uses the *Mayaguez* case at the beginning of the block of strategy lessons focused on the diplomatic, informational, military, economic, financial, intelligence, and law enforcement instruments of national power to highlight how quickly the NSC jumped to the military solution without seriously considering other options. This case incorporates so many elements of a typical strategy curriculum that it might be used in conjunction with lessons on decisionmaking and groupthink, analysis of strategic risk, or the political dimensions of strategy, to include the War

Powers Act and the concept of reputation. The first section below begins with one of the key starting points for any strategic choice: understanding the problem.

Understanding the Problem: Asking the "Why" Question. The first flaw of decisionmaking in the NSC was the failure to understand why they were in a crisis to begin with. NSC minutes reveal occasional questions about why the Khmer Rouge might have taken the ship, but Ford's advisors never addressed that issue adequately. The few instances when the question was asked were quickly overcome by calls to mine harbors, take reciprocal action against Cambodian ships, or bomb Cambodia using B-52s. At the beginning of the first NSC meeting, as Director of Central Intelligence William Colby briefed the situation, he stated, "We have no hard information on why the Khmer Communists seized the ship."¹⁰

Later in that first meeting, Deputy Secretary of Defense William Clements reminded the NSC that "we should not forget that there is a real chance that this is an in-house spat."¹¹ Yet by that point, most of the group had already moved on to discussing possible military options. Immediately after Clements's comment, President Ford stated, "This is interesting, but it does not solve our problem. . . . We should also issue orders to get the carrier turned around."¹² The fact that nobody could answer the "why" question is a problem but is not completely surprising in the preliminary phases of an incident. More troubling is how little time the NSC spent even asking why, and how quickly the President moved to military options without understanding the reason for the crisis.

There are even points where members of the NSC claimed that the Cambodians had done this before and released the crew and ship shortly after seizure. In the same initial brief, Colby stated, "A Panamanian charter vessel was seized by the Khmer Communists last week in roughly the same area, but was subsequently released."¹³ Secretary of Defense James Schlesinger followed up later in that same meeting, stating, "The

Cambodians have already seized three ships: A Panamanian, a Philippine and now an American. They did release the first two ships."¹⁴ Yet the NSC ignored these facts in favor of finding some action that would signal U.S. toughness, based on the assumption that the Cambodians must have targeted the United States.

Without properly addressing the source of the problem, all moves by the NSC were subject to flawed assumptions and poor judgment. These issues were worsened by the nature of the decision-making process in the NSC.

Groupthink and Strategic Risk. Groupthink can manifest in a number of ways and may result in a variety of outcomes, none of which are conducive to effective decisionmaking. In the *Mayaguez* case, there is significant evidence of groupthink, including the presence of time constraints (though self-imposed), and the group's unwillingness to consider alternative solutions (or to revisit alternate courses of action). Further evidence includes the lack of outside perspectives (despite legal requirements to consult with Congress) and the belief that whatever solution the group arrived at would be the correct one.

As discussed above, analogies to the *Pueblo* incident created a crisis-like atmosphere because of the perceived need to rescue the crewmembers before they reached mainland Cambodia. Drawing parallels to the *Pueblo* incident, despite the important differences between the two events, put additional time pressures on the decisionmakers. Also, the perceived importance of acting tough to strengthen U.S. reputation enhanced the crisis mentality. As a result, the NSC's assessment of the greatest risk to its strategic goals was for the crisis to become a prolonged hostage situation, as in the *Pueblo* case. The NSC was willing to accept some risk to personnel (both the crew and the military forces), as well as some domestic political risk, to reduce the likelihood of a hostage crisis. An understanding of strategic priorities is important for planners because it helps them identify where to accept higher levels of risk and where they must mitigate or transfer risk.



Marines with M-60 machine guns on deck of merchant ship SS *Mayaguez* after boarding it and finding it empty (U.S. Marine Corps)

The speed with which President Ford moved to a military solution without seriously considering alternate instruments of national power illustrates groupthink, but it also demonstrates the NSC's view of risk. Minutes into the first NSC meeting, James Schlesinger already offered the President military options, saying, "We can have a passive stance or we can be active. We can do such things as seizing Cambodian assets. We can assemble forces. We could seize a small island as a hostage. We might also consider a blockade."¹⁵

Shortly after that, Kissinger laid out the challenges for the team: "As I see it, Mr. President, we have two problems.

The first problem is how to get the ship back. The second problem is how the United States appears at this time. Actions that we would take to deal with one of these problems may not help to deal with the other."¹⁶ Kissinger continued, "What we need for the next 48 hours is a strong statement, a strong note and a show of force."¹⁷

The Vice President echoed Kissinger's view, stating, "I think a violent response is in order. The world should know that we will act and that we will act quickly. We should have an immediate response in terms of action. I do not know if we have any targets that

we can strike, but we should certainly consider this. If they get any hostages, this can go on forever."¹⁸

In the first NSC meeting, the President made the decision to act militarily, and after that, the NSC focused on the details of the operation, rarely revisiting nonmilitary options. Direct diplomacy was difficult because of the lack of communication with the new Khmer Rouge government, and the NSC dismissed economic measures and multilateral diplomacy because of the perceived need to resolve the crisis before the Cambodians took the crew to the mainland (again, based on the flawed *Pueblo* analogy).¹⁹ Many also believed other states would view nonmilitary courses of action as weak.

As a result, the Department of Defense put a joint operation into motion consisting of Marines, volunteers from an Air Force security squadron, Air Force helicopters out of Thailand, and Naval vessels in the region, namely the frigate USS *Holt* and the destroyer USS *Wilson*. The Navy also diverted the USS *Coral Sea* carrier group to the South China Sea. More Naval and Marine assets were available 24 hours later, but the NSC accepted a higher level of risk to the mission and to personnel in exchange for reducing the risk that the crew would become hostages on the mainland.

The War Powers Act: Testing the Imperial President. The War Powers Act is an important element of this case, although it is too involved to address sufficiently here. This was the first real test of the act, which largely failed because nobody seemed to know what the requirements were,²⁰ because Congress never challenged the Presidential authority to act, and because there were no real costs imposed on the President for ignoring Congress.

Since the operation was over quickly, the use of military forces against Cambodia never triggered section 5 of the War Powers Act. But the Ford administration's decision to mostly ignore sections 3 and 4, the consultation and reporting requirements, either out of ignorance or out of disdain, set a precedent for future Presidents when introducing

military forces into hostilities. It also signaled the NSC's willingness to accept some political risk with Congress to score a win with the American public and, more important, to enhance U.S. reputation overseas.

Operational Planning

Most officers have some familiarity with the 1986 Goldwater-Nichols Act and the cases that contributed to passage of that legislation. Operation *Eagle Claw*'s (1980) failure and the successful but flawed invasion of Grenada (1983) led Congress to reform how the Department of Defense plans and conducts joint operations. *Mayaguez* started the United States down that path even earlier.²¹ The multi-Service nature of the operation was born of necessity rather than a desire to be joint, and the problems with the operation show how poorly the Services worked together after Vietnam. That is not to diminish the heroism of those who participated in the operation, but to highlight how far the Defense Department has come since 1975.

Two key elements of the case related to operational planning curricula are joint functions and commander's intent.²² Planners did not talk about either of these in 1975, and this is why the *Mayaguez* Incident is such a useful case for discussing current joint doctrine.

Joint Functions. A discussion of joint functions in the *Mayaguez* operation would be an article of its own.²³ I mention only some key aspects here. One of the biggest problems with the operation had to do with the complex command and control structure, which was slightly different for each Service and violated concepts of unity of command.²⁴ The Marine Corps, in particular, was critical of the ad hoc nature of the operation and the dominance of U.S. Air Force planners.²⁵ Planning cells were also physically separated from one another, complicating communication and coordination.²⁶

Plenty of analysts widely criticized the intelligence community.²⁷ The bulk of scholarship suggests that the problem was less with the gathering or analysis of intelligence than with its dissemination, made

worse by the confused command and control structure.²⁸ Regardless of where to lay the blame, accurate intelligence was not available to the planners or to the forces during the operation.

Other discussions of joint functions might include decisions to go forward with the operation despite the lack of assets to both insert the Marines and to quickly extract them should things go wrong (movement and maneuver), the decision to withhold pre-invasion bombings out of concern that the crew was on Koh Tang (fires), and the lack of coordinated air and sea support for the Marines after landing on Koh Tang (fires).

This was not just a problem of undeveloped doctrine. Planners, admittedly under time pressures, failed to adequately plan for the most basic elements of an operation. Several choices at the operational and tactical levels nearly resulted in failure, not because of incorrect decisions, but because they did not take into account the strategic priorities of the mission.

Commander's Intent. It is apparent from the NSC minutes that President Ford and Henry Kissinger were concerned foremost with resolving the crisis in a way that enhanced the President's and the Nation's reputation. The rescue of the ship and crew were of secondary importance to the need to respond decisively and to resolve the crisis quickly and effectively. The crewmembers were means to an end.

Gerald Ford was still a new President and not yet tested in foreign policy, so he personally felt the need to gain a foreign policy win to secure his status and improve his popularity at home.²⁹ Kissinger's concern for reputation was more about the credibility of the country, having recently withdrawn from Vietnam, and as part of the larger Cold War competition. Kissinger believed that if the United States did not stand up to Cambodia, it would further harm the country's credibility, weaken relations with U.S. allies in the region and elsewhere, and possibly embolden North Korea and the Soviet Union.

The problem is that while the NSC did list its priorities, nobody relayed these priorities to the planners and local commanders. Moreover, the NSC never

adequately addressed a number of critical questions, including why the Khmer Rouge seized the ship, what some of the nonmilitary options were, and what the potential risks of military action were.

According to Joint Publication 3-0, *Joint Operations*, commander's intent "provides focus to the staff and helps subordinate and supporting commanders act to achieve the commander's objectives without further orders once the operation begins, even when the operation does not unfold as planned."³⁰ Had the NSC communicated national prestige as the top priority, military plans might have been different in a number of ways. For one thing, assault forces believed the first wave on Koh Tang would occur after pre-assault attacks on the island's defenses. Planners made the late decision to avoid pre-assault fires to avoid endangering the *Mayaguez* crew believed to be on the island. Had the message been clearer that this was about resolve and not the crew, then those fires would have occurred, the occupation of the island would have met less resistance, and at least that part of the operation would have held less risk.

Other operational decisions that might have been different with an understanding of NSC priorities include the order for pilots to shoot at boats potentially taking the crew to the mainland. In addition, waiting another 24–48 hours for more Naval and Marine assets to arrive in the region would have provided more support capabilities and more ground forces. Yet the NSC made those decisions to reduce the risk of the crew getting to the mainland, not out of concern for the crew's lives, but fear of a drawn-out hostage crisis.

Conclusion

This article highlights several elements of the *Mayaguez* Incident to facilitate its use as an instructional case study. Its value is to give military officers and civilian decisionmakers a better appreciation for the uses of history, strategy, and operational planning. The NSC was so fixated on the global Cold War that it ignored the local factors that contributed to the incident and ignored questions about why the Khmer Rouge seized the



CH-53 "Jolly Green" helicopter on Cambodia mainland during rescue operation (Jim Davis/Gerald R. Ford Presidential Library)

boat. Members of the NSC drew poor historical parallels, enhancing the sense of urgency, and an emphasis on looking tough contributed to these problems and to the sense of groupthink. Finally, the NSC's failure to communicate where it was willing to accept risk, based on its prioritization of goals, contributed to flawed planning assumptions.

Despite the effect these strategic mistakes had on the operation, the lens of modern operational planning provides valuable lessons for planners and strategists. There are a number of topics only briefly discussed above that deserve a more detailed discussion, but for which there is not room here. It is useful, though, to list some of these as a tool for generating discussion questions and/or facilitating additional research.

There is still debate about the relative success or failure of the operation. From a strategic point of view, the crew and ship were rescued, and Ford received a significant boost in popularity. As a result, the Ford administration achieved its political objectives. One important set of questions relates to the value of reputation. Showing competency in foreign affairs

for the American people is only one small part of what drove Ford.

Ford and his advisors clearly viewed reputation as a critical driver for their decisions, but to what extent did U.S. actions alter the perception of other states toward the United States as either an ally or an adversary? We cannot know if U.S. actions deterred North Korea or the Soviet Union. Nor can we know what would have happened if the United States had not acted quickly. Did U.S. allies feel that the United States was more reliable as an ally? Did the Nation benefit in its alliance relationships because of its actions?

There is little evidence on either side.³¹ While U.S. actions probably did not impress the Soviets, failure to act might have lowered Soviet perceptions of U.S. strength, at least in the region. Likewise, we cannot know if U.S. actions deterred future North Korean activities; the best we can say is nothing happened despite U.S. concerns before the incident that an attack was likely.

Most U.S. allies in the region appeared to view the military action favorably. Thailand was upset over the use of its territory for staging military operations,

as Kissinger predicted during the NSC meetings.³² But the Thai government was upset over the domestic political tension caused by U.S. troops being deployed from Thai territory, not that the United States was an unreliable ally or lacked the resolve to defend its interests. Other allies (Japan, Australia, and South Korea in particular) positively viewed U.S. willingness to protect its interests in the region, even after withdrawing from Vietnam. Japanese officials, for instance, called the U.S. military action "justified."³³

Other questions, more at the operational level, relate to whether planners or commanders would have done anything differently had they understood the strategic priority of preserving U.S. reputation, rather than assuming that the rescue of the crew and ship were the priorities. Some examples are offered in the text above, but one exercise is to have a class develop two sets of plans for a *Mayaguez* scenario—one in which rescue of the crew is articulated as the priority, and one where it is made known to the planners that looking tough is the main concern. Comparing the finished products would illustrate some critical lessons about the importance of understanding the objectives of a plan.

Finally, classes could discuss civil-military relations and the meaning of best military advice. There are examples in this case of military advisors minimizing or overlooking risk. There are also examples of insubordination, which may have saved the lives of the crew, precisely because officers did what they thought was right rather than what best fit the President's strategic priorities.³⁴

The above discussion highlights some of the operational challenges, created or worsened by a poor use of history, a lack of awareness of the strategic situation beyond the Cold War, an inability to recognize groupthink within the NSC, and a failure to communicate the strategic priorities. It is ironic that most of the failures occurred at the strategic level, yet the outcome gave the President a political victory. In the end, while the *Mayaguez* operation was flawed on many levels, the case is an incredibly valuable teaching tool for any part of a PME curriculum. JFQ

Notes

¹ Ric Hunter, "The Last Battle of Vietnam," *Flight Journal* 5, no. 2 (April 2000), 43–46; and Ralph Wetterhahn, *The Last Battle: The Mayaguez Incident and the End of the Vietnam War* (New York: Plume, 2002).

² Christopher Lamb, *Belief Systems and Decision Making in the Mayaguez Crisis* (Gainesville: University of Florida Press, 1989); John Guilmartin, *A Very Short War: The Mayaguez and the Battle of Koh Tang* (College Station: Texas A&M University Press, 1995); Robert Mahoney, *The Mayaguez Incident: Testing America's Resolve in the Post-Vietnam Era* (Lubbock: Texas Tech University Press, 2011); and James Wise and Scott Baron, *The 14-Hour War: Valor on Koh Tang and the Recapture of the SS Mayaguez* (Annapolis, MD: Naval Institute Press, 2011).

³ Kissinger initially served as Nixon's National Security Advisor, but he took on both roles from September 1973 until November 1975 and then finished out the Ford administration as the Secretary of State.

⁴ "France to Stop Paying Dues to SEATO in June, 1974," *New York Times*, June 10, 1973, 6. The Southeast Asia Treaty Organization disbanded in 1977.

⁵ Bernard Gwertzman, "U.S. Sees Foray for Ship as Signal to Communists," *New York Times*, May 16, 1975, 14; and Yafeng Xia and Zhihua Shen, "China's Last Ally: Beijing's Policy toward North Korea during the U.S.-China Rapprochement, 1970–1975," *Diplomatic History* 38 (November 2014), 1083–1113.

⁶ Richard Neustadt and Ernest May devote half a chapter to the *Mayaguez* case, though much of the information relies on Ford's autobiographical account since the National Security Council (NSC) minutes were still classified. Yuen Foong Khong only briefly mentions *Mayaguez* in the introductory chapter, but his book is useful for understanding the broader value of historical analogy. Richard Neustadt and Ernest May, *Thinking in Time: The Uses of History for Decision-Makers* (New York: The Free Press, 1986), 58–66; and Yuen Foong Khong, *Analogies at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965* (Princeton: Princeton University Press, 1992), 5.

⁷ "NSC Meeting, 5/12/1975," National Security Adviser's NSC Meeting File, Box 1, Gerald R. Ford Presidential Library, 8–9, available at <www.fordlibrarymuseum.gov/library/document/0312/1552386.pdf>.

⁸ Jordan Paust, "More Revelations about *Mayaguez* (and its Secret Cargo)," *Boston College International and Comparative Law Review* 4, no. 1 (1981), 61–76.

⁹ "NSC Meeting, 5/13/1975 (evening)," National Security Adviser's NSC Meeting File, Box 1, Gerald R. Ford Presidential Library, 20, available at <www.fordlibrarymuseum.gov/library/document/0312/1552388.pdf>.

¹⁰ "NSC Meeting, 5/12/1975," 2.

¹¹ *Ibid.*, 6.

¹² *Ibid.*

¹³ *Ibid.*, 3.

¹⁴ *Ibid.*, 4.

¹⁵ *Ibid.*, 3–4.

¹⁶ *Ibid.*, 4–5. Some suggest Kissinger's omission of the crew's return is telling of his priorities. A report shortly after the crisis even suggests Kissinger made a statement in the first NSC meeting that the lives of the crew "must unfortunately be a secondary consideration." See Peter Goldman, "Ford's Rescue Operation," *Newsweek*, May 26, 1975, 16. Kissinger denied making that statement, and no such comment appears in the minutes of that first meeting. Regardless of what Kissinger said or whether he prioritized rescue of the crew, it is apparent in reading the NSC minutes that looking tough was his priority and the ship (and crew) were both secondary.

¹⁷ "NSC Meeting, 5/12/1975," 5.

¹⁸ *Ibid.*, 8.

¹⁹ State Department records show attempts by the U.S. Embassy in China to get a message to the Cambodians, seemingly ignored by both the Chinese government and the Cambodian embassy. "Telegram from the Liaison Office in China to the Department of State: Message on Cambodian Seizure of U.S. Ship, Beijing, May 13, 1975 (0454Z)," Gerald R. Ford Presidential Library, National Security Advisor, NSC East Asian and Pacific Affairs Staff Files, 1973–1976, Box 29, Department of State, Telegrams and Cables (1). Similarly, attempts to go through the United Nations (UN) were largely ineffective. Lamb blames Kissinger for the delay in getting the UN involved. See Christopher Lamb, "The *Mayaguez* Crisis: Correcting 30 Years of Scholarship," *Political Science Quarterly* 133, no. 1 (2018), 35–76.

²⁰ President Ford even asked his NSC team, "What does the law say?" Philip Buchen, White House Counsel, replied, "The law says to consult before the introduction of forces and then to consult regularly. There is also a requirement for a report 48 hours after an action. We have to get that report in tonight." See "NSC Meeting, 5/14/1975," National Security Adviser's NSC Meeting File, Box 1, Gerald R. Ford Presidential Library, 23, available at <www.fordlibrarymuseum.gov/library/document/0312/1552389.pdf>. No consultation occurred and the report was an afterthought.

²¹ Christopher Lamb, *The Mayaguez Crisis: Mission Command and Civil-Military Relations* (Washington, DC: Office of the Joint Chiefs of Staff, 2018).

²² The NSC set the operational goals and micromanaged the operation. As a result, even though the NSC only provided much of the information typically in commander's intent (military endstate, operational risks, etc.) on an ad hoc basis, it is still useful to analyze this case using current doctrine.

²³ Joint functions include command and control, information, intelligence, fires, movement and maneuver, protection, and sustainment. Joint Publication (JP) 3-0, *Joint Operations* (Washington, DC: The Joint Staff, January 7, 2017, Incorporating Change 1, October 22, 2018), chap. 3.

²⁴ Mahoney, *The Mayaguez Incident*, 85–88, 225–228; and Urey Patrick, *The Mayaguez Operation* (Washington, DC: Center for Naval Analyses–Marine Corps Operational Analysis Group, April 1977), 17–18.

²⁵ Glenn Starnes, "The *Mayaguez* Incident: A Failure in Operational Leadership," Naval War College paper, June 16, 1995.

²⁶ Lucien Vandenbroucke, *Perilous Operations: Special Operations as an Instrument of Foreign Policy* (Oxford: Oxford University Press, 1993), 98.

²⁷ Poor estimates of enemy defenses on Koh Tang, as well as the location of the crew, contributed to lower chances of success. William Head, "Mayaguez: The Final Tragedy of the U.S. Involvement in the Vietnam War," *Journal of Third World Studies* 29, no. 1 (Spring 2012), 57–80; Mahoney, *The Mayaguez Incident*, 245–257; and Patrick, *The Mayaguez Operation*, 102.

²⁸ Mahoney, *The Mayaguez Incident*, 252–255; and Vandenbroucke, *Perilous Operations*, 99.

²⁹ Mahoney suggests this contributed to Ford using the crisis for political gain. Mahoney, *The Mayaguez Incident*, 217, 259. Lamb disagrees that domestic politics played a significant part in Ford's decisionmaking, suggesting it was entirely about showing U.S. toughness. Lamb, "The *Mayaguez* Crisis: Correcting 30 Years of Scholarship," 66–67.

³⁰ JP 3-0, II-7.

³¹ Mahoney spends two pages talking about the response of the Thai government, but there is little else in the *Mayaguez* scholarship about the tangible effects of U.S. actions on its reputation. Mahoney, *The Mayaguez Incident*, 191–192.

³² Kissinger offered, "We cannot do it [take military action] from Thailand. . . . I do not believe we can run military operations from there." See "NSC Minutes, 5/12/1975," 9. Telegrams from the U.S. Embassy in Thailand support this view and repeatedly expressed the challenge that military action from Thai territory would present to the existing government. "Telegram from the Embassy in Thailand to the Department of State: Thai Unwillingness to Let the U.S. Flex Its Thai Based Military Forces in Indochina, May 13, 1975," U.S. National Archives and Records Administration, Record Group 59, Central Foreign Policy Files.

³³ Richard Halloran, "Japanese Firmly Support U.S. in Freeing of *Mayaguez*," *New York Times*, May 16, 1975, 16.

³⁴ Lamb, "The *Mayaguez* Crisis: Correcting 30 Years of Scholarship," 43–44, 53–54.

F-35A Lightning II test aircraft assigned to 31st Test Evaluation Squadron from Edwards Air Force Base, California, released AIM-120 AMRAAM and AIM-9X missiles at QF-16 targets during live-fire test over range in Gulf of Mexico, June 12, 2018 (U.S. Air Force/Michael Jackson)



Can the F-35 Lightning II Joint Strike Fighter Avoid the Fate of the F-22 Raptor?

By Scott Hubinger

The United States has developed and procured two fifth-generation fighters incorporating stealth or low radar-observable attributes, the F-22 Raptor and the F-35

Lightning II. These two aircraft demonstrate the inherent tradeoffs between single purpose nonjoint aircraft (F-22) and multipurpose joint aircraft intended for multiple U.S. and allied military services (F-35). A review of the F-22 program generates questions and suggests pitfalls that might be common to both programs. For example, why was the F-22 program canceled after only a quarter of the intended number

of aircraft had been procured, and does the F-22's fate provide any lessons for the F-35 or identify any risks for program success? Additionally, has the United States made the right choices in our defense industrial base for advanced combat aircraft? Finally, new weapons systems such as the General Atomics MQ-1 Predator and MQ-9 Reaper are highly disruptive in that they represent a new way of waging war

Dr. Scott Hubinger is a senior chemist and team leader for chemical controls in the Bureau of Industry and Security at the Department of Commerce.

and were developed and manufactured by a new market entrant. Such disruptive technologies, along with continued technical advances and market changes in semiconductors and robotics, make decades-long design, development, and procurement cycles untenable. The purpose of this article is to highlight and contrast the F-22 and F-35 programs and make recommendations for adapting to rapid technological and market changes. To that end, the article is divided into four sections: the F-22 Raptor; the F-35 Lightning II and joint multinational (F-35) versus single-Service (F-22) acquisition models; semiconductors; and conclusions and recommendations to respond to the issues and concerns raised in sections one, two, and three.

F-22 Raptor Program

The determination of a requirement for an Advanced Tactical Fighter to replace the Air Force's F-15 Eagle was made by Air Force officials in 1981, and seven aircraft manufacturers were awarded initial concept definition contracts. The seven competitors were reduced to a Lockheed Martin, General Dynamics, and Boeing team and a Northrop and McDonnell Douglas team. The two competing designs emphasized maneuverability (Lockheed's YF-22) and stealth and speed (Northrop's YF-23), respectively, and in 1991, after a competitive fly-off, the Lockheed-led team won the design competition. Creation of formal teams in the design competition allowed the suppliers to share the risk of developing prototype aircraft and specialize in particular aspects of advanced fighter aircraft while also reducing competition. The final design incorporated elements from both design prototypes, with an emphasis on leading-edge stealth, integrated avionics, supercruise (that is, the ability to exceed the speed of sound without using afterburner), and vectored engine thrust (providing improved maneuverability) technologies.¹

The manufacture of advanced fighter aircraft requires engineering and production expertise and processes not found in

civilian aviation with material, avionics, engines, and systems integration technologies that are at the limit of, or beyond, current state of the art. Furthermore, development and acquisition of advanced fighter aircraft are sensitive to changes in technology. In the 1960s, McDonnell Douglas established leadership with its expertise in avionics and guided missiles (for example, the F-4 Phantom II and F-15 Eagle). Similarly, development of innovative stealth technology, first used in the F-117 Nighthawk by Lockheed Martin in the 1980s, shifted leadership to that firm and contributed to its role as prime contractor in both the F-22 and F-35 acquisition programs.²

The Air Force planned to procure 790 F-22s. Early post-Cold War cuts reduced this to 648, and by 1997 the Department of Defense (DOD) budget had declined by 38 percent compared to its 1985 budget and procurement had been reduced by two-thirds. This budget tightening put pressure on the F-22 program, but even as late as 2008, the Air Force Chief of Staff publicly stated that at least 381 F-22s were needed to meet operational requirements. Nevertheless, Secretary of Defense Robert Gates announced in 2009 that F-22 production would end at 187.³ How and why did this happen?

The DOD 1993 Bottom-Up Review (BUR) reduced the Air Force's total fighter strength to 20 fighter wing equivalents and the F-22's production total to just 442 aircraft. The major criticism of the F-22 was that the post-Cold War threat environment did not justify its cost, and the BUR specified DOD's major responsibilities as deterring major regional conflicts, maintaining an overseas presence, conducting small-scale interventions, and preventing attacks involving weapons of mass destruction. None of these major responsibilities included a need to battle superior numbers of advanced Soviet fighters and attack aircraft.⁴

Continuing perturbations caused by technical challenges and funding instability forced the Air Force to restructure the F-22 program in 1993, 1994, 1996, and 1997, and rising costs resulted in the creation of a joint estimating team (JET)

in 1996 to estimate the program's future costs and determine ways to control the growth of such costs. The 1998 National Defense Authorization Act used the JET estimate and imposed a \$43.4 billion limit on production costs, lowered by Congress in 2009 to \$37.6 billion to account for lower than expected inflation. Thus, a requirements-driven procurement process became a budget-driven process and, under this "buy-to-budget" strategy, decreased production numbers would have to fund any additional production costs (that is, in order to stay under the cap).⁵ Such a buy-to-budget strategy is colloquially referred to as a "death spiral" in procurement parlance as decreasing unit production numbers lead to increasing per unit production costs, which in turn lead to further cuts in unit production numbers and so on and so forth.

Compounding the budget problems, the F-22 faced political pressures. In 2001, Donald Rumsfeld became Secretary of Defense with a mandate to reform DOD. During Congressional testimony he used the word "transformation" in describing his efforts to prepare the department for the new and different threats of the post-Cold War world and emphasized the need to recapitalize important weapons systems such as the Tomahawk cruise missile, the F-15, the F-18, and the F-16, developed in the 1970s. The Secretary's testimony did not include the Air Force's highest acquisition priority (the F-22). More cost overruns, along with an embarrassing tanker acquisition scandal involving a senior Air Force civilian leader and the Boeing Corporation (Lockheed Martin's manufacturing team partner on the F-22 program), led to Presidential Budget Directive 753, which removed production funding after fiscal year 2008, ending production at 183 units (the Air Force spent the next 5 years trying to overturn this decision but only got 4 additional F-22s).⁶

F-35 Lightning II Program

The F-35 Lightning II, also known as the Joint Strike Fighter (JSF), is the result of the merger of programs started in the 1980s and early 1990s. During this period, a plethora of programs tried to develop new tactical aircraft for the



F-35A Lightning II pilot assigned to 4th Expeditionary Fighter Squadron dons anti-gravity suit in preparation for first combat sortie in U.S. Air Forces Central Command area of responsibility, Al Dhafra Air Base, United Arab Emirates, April 26, 2019 (U.S. Air Force/Jocelyn A. Ford)

U.S. Air Force, the U.S. Navy, the U.S. Marine Corps, and the United Kingdom's Royal Navy. Starting in 1983, the Defense Advanced Research Projects Agency (DARPA) began looking for available technologies for a follow-on supersonic replacement for the Marine AV-8 Harrier advanced short takeoff/vertical landing (ASTOVL) aircraft. This program would eventually become a joint U.S.-UK collaboration. Next, in the late 1980s, Lockheed Martin's Skunk Works became involved in a classified "black" program with the National Aeronautics and Space Administration (NASA), looking into the technical feasibility of a stealthy supersonic fighter (SSF) with short takeoff/vertical landing (STOVL) capability utilizing the Skunk Work's expertise in stealth and NASA facilities and capabilities, including wind tunnels, skilled personnel, and supercomputers. This highly classified

program showed that supersonic stealth was possible. The DARPA ASTOVL and NASA/Skunk Works SSF design concepts were originally intended as replacements for the U.S. Marine AV-8B fighter and the UK Harrier II jump-jet. However, when multiple variants capable of meeting other service needs (that is, joint) were suggested in 1993, the two programs were consolidated as the Common Affordable Lightweight Fighter (CALF) program and managed by DARPA due to the experimental nature of the concepts. The goal of the CALF program was to develop the technologies and concepts needed to manufacture ASTOVL aircraft for the U.S. Marines and the Royal Navy and at the same time use those technologies and concepts to develop and manufacture a highly common conventional takeoff and landing (CTOL) variant for the U.S. Air Force.⁷

The U.S. Navy began its Advanced Tactical Aircraft (ATA) program in 1983 to develop a long-range, very-low-observable, high-payload attack aircraft to replace its carrier-based Grumman A-6 Intruder. Dubbed the A-12 Avenger II, this flying wing design was intended as a long-range subsonic aircraft with a large internal weapons load including air-to-surface and air-to-air weapons, but after major cost and schedule overruns and technical problems, the program was canceled in early 1991. During this same time period, the Navy also agreed, after Congressional intervention, to evaluate a version of the Air Force's Advanced Tactical Fighter (now the F-22) under the Naval Advanced Tactical Fighter (NATF) program as a possible replacement for the Navy F-14 Tomcat in return for the Air Force's evaluation of a derivative of the Navy's ATA as a replacement for the Air Force F-111

Aardvark. However, in early 1991, the Navy realized that a series of upgrades to its F-14s could meet air superiority needs through 2015, and consideration of the NATF was dropped. Similarly, in the early 1990s, the Air Force initiated a Multi-Role Fighter program to develop a low-cost replacement for the F-16 Fighting Falcon, with a per unit flyaway cost (that is, including only the cost of production and production tools essential for building a single unit) from \$35 million to \$50 million. However, the end of the Cold War made the service life situation for the F-16 much less critical, and the program was put on hold in August 1992 and then canceled after the 1993 BUR.⁸

After cancellation of both the ATA and the NATF programs, the Navy Secretary ordered commencement of a new A-6 replacement program. This program, dubbed the A-X program, was designed to develop an advanced, “high-end,” carrier-based multimission aircraft with day/night, all-weather capability, low observables, long range, two engines, two crew, and advanced integrated avionics and countermeasures. With the Air Force’s participation (it was still seeking a replacement for the F-111), the program became known as the A/F-X program, but it too was canceled by the 1993 BUR, and the A/F-X efforts were directed toward transitioning applicable experience and results to the upcoming Joint Advanced Strike Technology (JAST) program.⁹ The goal of the JAST program, which became the JSF program with the merger of the CALF and JAST programs, was to create a common technology platform that would, in theory, gain economies of scale and require simpler logistics due to interchangeable spare parts that could be used to replace three distinctly different aircraft: the F-16 as a multirole light fighter; the F-18 carrier-based, multirole fighter; and the Harrier as a STOVL, with a high degree of commonality among the three different versions. This merging of aircraft types was made possible (rationalized) by the consolidation of the U.S. defense industry after the end of the Cold War; this created larger, more capable companies,

but also further limited competition in a market not particularly susceptible to competitive market forces.¹⁰

Setting Requirements. The F-35 Lightning II is intended (designed) to be a relatively affordable fifth-generation (stealth) strike fighter that can be manufactured in three different versions for the Air Force, the Marines, and the Navy, respectively, with a high degree of commonality (70–90 percent) in their airframes, weapons systems, avionics, powerplants, and software to avoid, in theory, the greater expense of developing, procuring, and operating and sustaining three completely different aircraft designed to meet each Service’s similar but different operational requirements. Thus, in November 1996, DOD selected Lockheed Martin and Boeing to compete in the JAST Concept Demonstration phase and issued contracts so each company could independently build and test-fly two aircraft to validate their competing concepts for all three planned variants. Separately, the department also contracted with Pratt and Whitney to provide propulsion hardware and engineering support. In October 2001, DOD selected Lockheed’s design as the competition winner, and the Joint Strike Fighter program entered the System Development and Demonstration phase, with contracts to Lockheed Martin for the aircraft and Pratt and Whitney for the powerplant.¹¹

The F-35A, developed for the U.S. Air Force, is a CTOL aircraft. As the least technically challenging of the three variants, it is also the least expensive. The F-35As are intended to replace F-16 Fighting Falcons, A-10 Thunderbolt IIs, and perhaps some of the older F-15 Eagles. The F-35A is reported not to be as stealthy or as capable in air-to-air combat as the F-22, but better at air-to-ground combat than the F-22 and stealthier than the F-16. The F-35A is intended as a more affordable complement to the F-22 Raptor, but such affordability will depend on how many units are eventually procured. The F-35B, developed for the U.S. Marines, is a STOVL aircraft and is the most expensive and most technically challenging of the three

variants. F-35Bs are intended to replace the AV-8B Harrier STOVL aircraft, the F/A-18A/B/C/D CTOL strike fighters, and the UK Royal Navy Harrier II aircraft. The F-35B’s more sophisticated sensor suite and very-low-observable qualities are wanted by the Marines in order to enhance support for U.S. forces. The F-35C, developed for the U.S. Navy, is a carrier-based CTOL aircraft and is midway in cost and technical complexity between the A and B versions. The Navy believes that commonality designed into the F-35 will minimize development, procurement, and operating costs and enhance interoperability both with the U.S. Air Force and with allied partner nations. Finally, the F-35’s integrated avionics software is intended and designed to automatically combine information from on-board sensors with information from Aegis and other air defense systems (for example, from other combat aircraft) to enhance combat capability and disruptively change the way U.S. combat aircraft work with each other and with allied aircraft.¹²

Joint Multinational vs. Single-Service Acquisition Models. The F-22 Raptor was designed, developed, manufactured, and procured as a single-Service, single-role fighter. The F-35 Lightning II was designed and developed and is being manufactured and procured as a joint (multi-Service), multirole, multinational combat aircraft. However, this does not alter or eliminate the fundamental challenges, as described earlier, that contributed to the F-22 program’s failure to procure the planned quantity of aircraft and, in some respects, makes them worse. One of the reasons for this is that potential savings¹³ in overall life cycle costs for a joint acquisition program versus a set of single-Service programs—achieved by cutting out duplicative research, development, test, and evaluation costs and gaining greater economies of scale in manufacturing and sustainment efforts—may be reduced by the need for greater design, manufacturing, and sustainment complexity to accommodate multiple Service requirements in a single “common” design. For example, the original design goal for the F-35 was



KC-135 Stratotanker refuels F-22 Raptor over Nevada Test and Training Range during U.S. Air Force Weapons School's Deliberate Strike Night, June 16, 2016 (U.S. Air Force/Kevin Tanenbaum)

to achieve a commonality of 80 percent, but at milestone B, the three variants varied from 45 percent to 70 percent commonality by airframe weight; by July 2008, airframe commonality ranged from 27 percent to 43 percent.¹⁴ Furthermore, the number of combat aircraft prime contractors in the United States has decreased from eight in the 1980s to only three today (Lockheed Martin, Northrop Grumman, and Boeing), and currently only Lockheed Martin is a prime contractor for the manufacture of an advanced fifth-generation manned combat aircraft. This reduction in the number of prime contractors has reduced competition, may discourage innovation, and makes it more difficult for the U.S. Government to control costs.¹⁵

Another challenge faced by the F-35 program is the need for the same manufacturer to produce the three different variants. Production of an inhomogeneous product can complicate the

acquisition of learning by manufacturing plant workers and managers and speed the depreciation of any learning acquired due to the need to halt production of one product in order to produce a different product. This learning process is particularly important in the manufacture of combat aircraft where highly skilled labor accounts for a large percentage of total costs and accumulated manufacturing experience yields progressively greater reductions in manufacturing costs as experience increases productivity and reduces per unit costs. If the differences among the three different variants were slight, as was originally planned, negative effects on learning might be minor. However, with significant differences, a slower learning process and accelerated depreciation of accumulated production experience significantly adds to program costs and, therefore, program risk.¹⁶

Finally, an important and significant difference between the F-22 program and

the F-35 program is the internationalization of both the F-35's development and its procurement. Currently, the F-35 program has three levels of international partnership. The United Kingdom is the only level 1 international partner, contributing approximately \$2 billion toward development costs. Italy and the Netherlands are the only level 2 international partners, contributing approximately \$1 billion and \$800 million, respectively, toward development costs. Level 3 international partners include Turkey, Canada, Australia, Norway, and Denmark, contributing, among them, approximately \$725 million toward development costs.¹⁷ Anticipated purchases of F-35s by U.S. military Services and by our international partners and allies include 1,763 F-35As by the U.S. Air Force; 353 F-35Bs and 67 F-35Cs by the U.S. Marines; 260 F-35Cs by the U.S. Navy; 138 F-35As by the United Kingdom; 100 F-35As by Turkey; 60

F-35As and 30 F-35Bs by Italy; 72 F-35As by Australia; 52 F-35As by Norway; 50 F-35As by Israel; 42 F-35As by Japan; 40 F-35As by the Republic of Korea; 37 F-35As by the Netherlands; 34 F-35As by Belgium; and 27 F-35As by Denmark.¹⁸ However, the cost of all F-35s produced by Lockheed Martin, both for domestic use by U.S. military Services and for use by foreign governments, is negotiated between the U.S. Government and Lockheed Martin, while the price each foreign government pays is negotiated between the U.S. Government and each respective foreign government. The “export” version of the F-35 may also not include all the features of the “domestic” version, thus creating even more variants and further complicating the manufacturing learning process.

Offsets are also negotiated separately between Lockheed Martin and each respective foreign government. While perhaps unprecedented in global scale in the case of the F-35 program, offsets in both defense and nondefense industries are fairly common. An *offset* is an agreement wherein the buyer includes within the contract the condition that the seller has to perform certain activities that benefit the buyer. The agreement can take the form of coproduction, subcontracting, licensed production, technology transfer, and other forms of industrial cooperation such as training.¹⁹ In the case of the F-35, Lockheed Martin is incentivized to offer offsets in return for increased orders from each foreign government and also by the possibility of cheaper production, assembly, or other costs outside the United States. Foreign buyers are incentivized by the possibility of technology transfer to and/or increased jobs for their domestic industries. This complex multiparty matrix of negotiated prices between the U.S. Government and Lockheed Martin, negotiated prices between the U.S. Government and each foreign government, and negotiated offsets between Lockheed Martin and each foreign government makes managing costs even more difficult and may benefit foreign buyers at the expense of the U.S. taxpayer.

Program Turbulence. The JSF program has been restructured three times

so far: in December 2003, March 2007, and March 2012. The last restructuring became necessary when, in early 2010, unit cost estimates exceeded critical thresholds set by statute—an event known as a Nunn-McCurdy breach. Pursuant to that statute and to avoid termination of the program, the Secretary of Defense certified to Congress in June 2010 that the program was essential to national security.²⁰ As required by statute, DOD then revoked the prior milestone approval, established a new acquisition baseline, and began restructuring the program to extend testing and delay delivery schedules, and reduced near-term aircraft procurement quantities by deferring the procurement of aircraft into the future (for example, through 2044), but did not decrease total aircraft procurement numbers. According to the U.S. Government Accountability Office’s (GAO’s) April 2015 report on the JSF program, the F-35’s significant cost, schedule, and performance problems are due, in the GAO’s judgment, to decisions made at key program milestones without sufficient product knowledge. Specifically, Lockheed Martin’s design was selected in October 2001 before the aircraft’s design and critical technologies had been sufficiently developed. In addition, initial program scheduling called for a concurrent acquisition strategy with a high degree of overlap between development, testing, and manufacture, and, although the degree of concurrency has been reduced, it has not been eliminated.²¹

Furthermore, sustainment costs for the three U.S. military Services over the 60-year life cycle for each aircraft are estimated at \$1.12 trillion. Thus, DOD is working to implement an affordable sustainment strategy that can meet the needs of U.S. military Services and of our international partners and allies, and that can sustain more than 3,100 F-35 aircraft over the F-35’s 100-year development, production, and service life cycle. However, this strategy faces challenges, including reliance on prime contractor Lockheed Martin for sustainment support in addition to product integration and dependence of all F-35 customers, domestic and foreign, on a shared global

pool of assets managed by Lockheed Martin that are unique to the F-35 program.²² Reducing sustainment cost is crucial to avoiding downward pressure on production numbers to pay for increased or unfunded sustainment costs. There are also asymmetries between the different U.S. military Services and our international partners and allies regarding the number of aircraft to be purchased and sustained, which will result in asymmetric dependencies on the success of the F-35 program. Both of these factors could result in significantly fewer aircraft being purchased than currently anticipated and lead to significant unit cost increases as production volumes decrease, as happened with the F-22 Raptor program.

Finally, the F-35’s integration of sensors and weapons, both internally and with other aircraft, is believed to be its most important capability, and this enhanced capability to integrate sensors and weapons is achieved, primarily, via complex software.²³ Functionality provided by software has grown significantly since the 1960s. Starting at less than 10 percent with the introduction of the F-4 Phantom II in 1960, this functionality grew to 10 percent with the introduction of the A-7 Corsair II in 1964, to 20 percent with the introduction of the F-111 Aardvark in 1970, to 35 percent with the introduction of the F-15 Eagle in 1975, to 45 percent with the introduction of the F-16 Fighting Falcon in 1982, to 65 percent with the introduction of the B-2 Spirit in 1990, and to 80 percent with the introduction of the F-22 Raptor in 2000.²⁴ According to an April 2014 review by the Congressional Research Service, writing, validating, debugging, and upgrading the F-35’s software (that is, from the Block I version providing the aircraft’s basic flying capabilities installed in early F-35 deliveries all the way through to Block 3F, which is intended to provide the full suite of warfighting capabilities) will be among the JSF program’s greatest and most expensive challenges.²⁵ In its April 2017 review of the program, the GAO also stressed the importance of software and raised concerns about testing delays and increased costs for the complete development of the F-35’s software.²⁶

Current Program Status. The F-35 program has made progress. As of September 28, 2018, more than 320 aircraft were operating from 15 bases globally, approximately 680 pilots and 6,100 maintainers had been trained, and the fleet had more than 155,000 cumulative flight hours.²⁷ Initial operational capability was declared by the U.S. Marines for the F-35B in July 2015 and by the U.S. Air Force for the F-35A in August 2016.²⁸ Additionally, prime contractor Lockheed Martin has improved manufacturing efficiency and demonstrated learning as it continues producing aircraft. Average labor hours per aircraft delivered have decreased significantly from 2012 to 2017. Total hours for scrap, rework, and repair per aircraft delivered have also decreased. Likewise, Pratt and Whitney has demonstrated improvements in manufacturing efficiency and decreased labor hours. The F-35 program office is also investing in projects to lower production and sustainment costs and is pursuing economic order quantity purchases of components that will be used across multiple procurement lots of aircraft.²⁹ Thus, for low rate initial production (LRIP) Lot 11, with deliveries scheduled to begin in 2019, the F-35A unit price including aircraft, engine, and fee, will be \$89.2 million, a 5.4 percent reduction from the \$94.3 million for LRIP Lot 10. The F-35B unit cost will be \$115.5 million, a 5.7 percent reduction from the \$122.4 million for LRIP Lot 10. The F-35C unit cost will be \$107.7 million, an 11.1 percent reduction from the \$121.2 million for LRIP Lot 10.³⁰ Finally, a statistical analysis by the RAND Corporation for Project Air Force has shown that significant cost savings are achievable by making investments in design and manufacturing improvements to reduce the per unit cost and by purchasing F-35 aircraft in multiple lots, to name just two examples.³¹

Semiconductors

As stated in the introduction, technical advances and market changes in semiconductors and robotics make decades-long design, development, and procurement cycles for advanced

weapons systems like the F-35 Lightning II untenable and will require shorter production cycles with or without cost savings. Today, the cost to build a manufacturing facility or fabrication plant (otherwise known as a fab) with leading-edge technology for the manufacture of semiconductors is \$10 billion and rising. Because of these costs, companies that cannot produce at scale or afford to operate a fab themselves take advantage of the fabless model, where production is shifted to a global ecosystem of companies creating microchip designs, microchip design tools, components and materials, and operating fabs dedicated to the manufacture of other company designs. Consequently, the global semiconductor manufacturing sector at the leading technology edge has consolidated dramatically, and only four firms globally manufacture at 14 nanometer (nm) or have the potential to go to the 10 and 7 nm nodes: Intel in the United States; Taiwan Semiconductor Manufacturing Company in Taiwan; Abu Dhabi, United Arab Emirates–owned Global Foundries in New York state; and Samsung Electronics in South Korea. Because of this consolidation and the fact that over 98 percent of demand for semiconductors comes from the private and commercial sectors, not the U.S. Government or Defense industry, access to genuine noncounterfeit military computer chips and assured access to manufacturing capabilities for advanced weapons systems is increasingly at risk. Therefore, as noted in a Spring 2016 electronics industry study report published by National Defense University's Eisenhower School for National Security and Resource Strategy, major U.S. weapons systems are exposed to obsolescence in their semiconductor-based electronic and software subsystems.³²

Furthermore, guaranteed access to leading-edge silicon foundry processes is critical to the Nation's ability to maintain the technological edge and dominance enjoyed by U.S. Armed Forces on the modern battlefield. These processes make possible the development of new capabilities in navigation, sensing, and

electronic warfare, just to name a few. In 2014, trusted access to both leading-edge silicon technology and legacy silicon technologies under DOD's Trusted Foundry Program was limited to only a single company, IBM. After 2014, the sale of IBM's semiconductor facilities to Abu Dhabi–owned Global Foundries could have dealt a critical blow to DOD's ability to access technologies at 65 nm and below. The agreement between the Trusted Foundry Program and Global Foundries to form Global Foundries 2 appears to provide current and near-term access down to the 14 nm node. However, the long-term economic viability of this arrangement is questionable in the face of pressures to achieve commercial profitability within the former IBM facilities.³³

These changes in the semiconductor industry and market are also affecting DOD's F-35 modernization program, termed Block 4, as officials openly state that the F-35's current data processor is operating at maximum capacity and will need to be replaced with an updated processor with increased capacity in order for the first increment of Block 4 to function as intended.³⁴ Given its low market share (2 percent or less), DOD is entirely dependent on Global Foundries 2 and small volume producers of legacy computer chips for its data processor and other semiconductor needs.

In addition to being at risk of obsolescence in their semiconductor-based electronic and software subsystems, current manned combat aircraft, including the F-35, are also at risk of obsolescence in their technological edge and dominance on the battlefield due to these same trends in semiconductors and the electronic devices that incorporate them. For example, the development and deployment of the General Atomics MQ-1 Predator and MQ-9 Reaper would not have been possible without the greatly increased performance and decreased weight of today's semiconductor-based devices. Unmanned military aircraft such as the Predator and Reaper are also highly disruptive in that they represent a new way of waging war and were developed and manufactured by a new, non–Lockheed Martin market entrant.



U.S. Air Force F-35A Lightning II assigned to 4th Expeditionary Fighter Squadron taxis down flightline before taking off from Al Dhafra Air Base, United Arab Emirates, April 24, 2019 (U.S. Air Force/Chris Drzazgowski)

Further disruptions can be easily anticipated and predicted. For example, a decade ago the idea that drones could act as stationary “air mines” or even act collectively as self-guiding swarms would have seemed as ridiculous and as tactically useless as the barrage balloons and wind-blown fire balloons of the previous century. However, algorithms already exist today for programming drones to “see and avoid,” and an ability to see and avoid can just as easily be turned into a see-and-not-avoid ability. Moreover, drone swarming was demonstrated by the Naval Postgraduate School in August 2015, when 50 drones were manually controlled with a single controller. Subsequently, in November 2016, the Intel Corporation created a holiday light show for Disney Springs, Florida, with 300 drones moving in complex choreographed three-dimensional formations, also with just a single controller. Complex choreographed three-dimensional drone formations were also

demonstrated at the 2017 Super Bowl halftime show that starred Lady Gaga. Furthermore, any collision between an aircraft and a drone will be much more destructive than a comparable collision with a bird due to the material composition of the drone. In collisions with aircraft, birds behave more like fluids upon impact, such that the disintegration of the bird absorbs much of the impact energy. In contrast, drones are made from metal, plastic, and other relatively nondeformable materials, so any aircraft struck by a drone will be exposed to a much greater impact energy.³⁵ Lastly, it has been suggested that a tactically autonomous, machine-piloted combat aircraft could bring new and unmatched lethality to air-to-air combat, and by continuously sending telemetry to a ground or airborne control station, the putative autonomous combat aircraft could learn from its own death and in near real time provide adaptations to other autonomous combat aircraft in the fight.³⁶

Conclusions and Recommendations

With a total planned procurement of all F-35 variants on the order of 3,000 units, short-term, small-volume procurements are not advisable once full rate production begins as it disincentivizes Lockheed Martin and its suppliers from making long-term investments in equipment and worker learning that could lead to lower per unit costs. The Defense Department should, therefore, work with the White House and Congress to authorize, but not require, longer term multiyear procurements for major weapons systems like the F-35. The F-35 program office should also continue to expand upon projects aimed at lowering production and sustainment costs and economic order quantity purchases of components that will be used across multiple aircraft types and multiple procurement lots.

In addition, DOD’s development and acquisition efforts in the area of combat

aircraft are too slow in the face of rapid changes in combat aircraft capabilities, driven largely by advances in semiconductors and the electronic devices and software that utilize them. Therefore, DOD should shift its acquisition focus for combat aircraft to the following:

- sixth-generation weapons systems, assemblies, sub-assemblies, and software for current fifth-generation F-22 and F-35 aircraft using U.S. Government-owned intellectual property and related design authority rights for these aircraft
- drones, which can be used in defensive and/or offensive antiaircraft capacities
- autonomous combat aircraft capable of remotely targeting and destroying enemy aircraft.

The purpose of these three suggested initiatives is to expedite the development and procurement of new innovative weapons and tactics and to provide opportunities for new defense market entrants.

Finally, many reports in the literature, including most recently a comprehensive analysis by the RAND Corporation under Project Air Force, have indicated that savings from joint acquisition of major weapons systems such as the F-35 are at best an open question and are extremely difficult to achieve given the need to meet divergent Service and country requirements within the same design. Instead, the focus should be on common weapons systems, assemblies, subassemblies, and software that can be shared by different platforms and on the very real nonfinancial benefits of joint acquisitions to include greater tactical and operational interoperability between military Services and greater military-industrial cooperation between the United States and its allies. JFQ

The author would like to express his appreciation and thanks to the faculty and staff of the National Defense University's Dwight D. Eisenhower School for National Security and Resource Strategy for their help and support.

Notes

¹ David R. King and John D. Driessnack, "Analysis of Competition in the Defense Industrial Base: An F-22 Case Study," *Contemporary Economic Policy* 55 (January 2006), 57–66.

² Ibid.

³ Christopher J. Niemi, "The F-22 Acquisition Program: Consequences for the U.S. Air Force's Fighter Fleet," *Air & Space Power Journal* (November–December 2012), 53–82, available at <www.airuniversity.af.edu/POR-TALS/10/ASPJ/journals/Volume-26_Issue-6/F-Niemi.pdf>.

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

⁷ See "History," F-35 Lightning II Program Web site, available at <http://www.jsf.mil/history/his_prejast.htm>.

⁸ Ibid.

⁹ Ibid.

¹⁰ Danny Lam and Brian Paul Cozzarin, "The Joint Strike Fighter/F-35 Program: A Canadian Technology Policy Perspective," *Air & Space Power Journal* (March–April 2014), 45–76.

¹¹ Jeremiah Gertler, *F-35 Joint Strike Fighter (JSF) Program*, RL30563 (Washington, DC: Congressional Research Service, April 29, 2014), available at <<https://fas.org/sgp/crs/weapons/RL30563.pdf>>.

¹² Robbin F. Laird and Edward Timperlake, "The F-35 and the Future of Power Projection," *Joint Force Quarterly* 66 (3rd Quarter 2012), 85–93.

¹³ Mark A. Lorell, "Commonality: Where It Works and Fails," *Aviation Week & Space Technology* 177 (March 2015).

¹⁴ Mark A. Lorell et al., *Do Joint Fighter Programs Save Money?* (Santa Monica, CA: RAND, 2013).

¹⁵ Trevor Taylor, "Competition in Defence Practice: Theory and Reality," in *Emerging Strategies in Defense Acquisitions and Military Procurement*, ed. Kevin Burgess and Peter Antill (Hershey, PA: IGI Global, 2016), 22–38.

¹⁶ Aneli Bongers, "Learning and Forgetting in the Jet Fighter Aircraft Industry," *PLOS ONE* 12 (September 2017), 1–19.

¹⁷ See "Program: International Participation," F-35 Lightning II Program Web site, available at <www.jsf.mil/program/prog_intl.htm>.

¹⁸ Tom Kaminski, "F-35 Lightning II: Country by Country Analysis," *Aviation News*, December 2018, 32–38.

¹⁹ Anna Margaretha Malm, Anna Fredriksson, and Kerstin Johansen, "Bridging Capability Gaps in Technology Transfers Within Related Offsets," *Journal of Manufacturing Management* 27 (2016), 640–661.

²⁰ Moshe Schwartz, *The Nunn-McCurdy Act: Background, Analysis, and Issues for Congress*, R41293 (Washington, DC: Congressional Research Service, March 3, 2015), available at

<www.hsdl.org/?view&did=763043>.

²¹ Government Accountability Office (GAO), *F-35 Joint Strike Fighter: Assessment Needed to Address Affordability Challenges*, GAO-15-364 (Washington, DC: GAO, 2015).

²² GAO, *F-35 Aircraft Sustainment: DOD Needs to Address Challenges Affecting Readiness and Cost Transparency*, GAO-18-75 (Washington, DC: GAO, 2017).

²³ Gertler, *F-35 Joint Strike Fighter (JSF) Program*.

²⁴ Lam and Cozzarin, "The Joint Strike Fighter/F-35 Program," 45–76.

²⁵ Gertler, *F-35 Joint Strike Fighter (JSF) Program*.

²⁶ GAO, *F-35 Joint Strike Fighter: DOD Needs to Complete Developmental Testing before Making Significant New Investments*, GAO-17-351 (Washington, DC: GAO, 2017).

²⁷ "Pentagon and Lockheed Martin Agree to Reduced F-35 Price in New Production Contract," press release, F-35 Lightning II Program Web site, September 28, 2018, available at <www.jsf.mil/news/docs/20180927_LRIP_11_Press_Release_v2.pdf>.

²⁸ Kaminski, "F-35 Lightning II."

²⁹ GAO, *F-35 Joint Strike Fighter: Development Is Nearly Complete, but Deficiencies Found in Testing Need to Be Resolved*, GAO-18-321 (Washington, DC: GAO, 2018).

³⁰ "Pentagon and Lockheed Martin Agree to Reduced F-35 Price in New Production Contract."

³¹ James D. Powers et al., *F-35 Block Buy: An Assessment of Potential Savings*, RR-2063-AF (Santa Monica, CA: RAND, July 18, 2018), available at <www.rand.org/pubs/research_reports/RR2063.html>.

³² B.G. Hussein Bani-Yassein et al., *Electronics Industry Study Report* (Washington, DC: Dwight D. Eisenhower School for National Security and Resource Strategy, Spring 2016), available at <<http://es.ndu.edu/Portals/75/Documents/industry-study/reports/2016/es-is-report-electronics-2016.pdf>>.

³³ Ibid.

³⁴ GAO, *F-35 Joint Strike Fighter: DOD's Proposed Follow-on Modernization Acquisition Strategy Reflects an Incremental Approach Although Plans Are Not Yet Finalized*, GAO-17-690R (Washington, DC: GAO, 2017).

³⁵ Leslie F. Hauck III and John P. Geis II, "Air Mines: Countering the Drone Threat to Aircraft," *Air & Space Power Journal* (Spring 2017), 26–40.

³⁶ Michael W. Byrnes, "Nightfall: Machine Autonomy in Air-to-Air Combat," *Air & Space Power Journal* (May–June 2014), 48–75.

CALL FOR ENTRIES

for the

2020 Secretary of Defense and
2020 Chairman of the Joint Chiefs of Staff

Essay Competitions

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

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

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

When? Anytime during the 2019–2020 academic year. Students are encouraged to begin early and avoid the spring rush. Final judging and selection of winners take place May 2020, at NDU Press, Fort McNair, Washington, DC.

For further information, see your college's essay coordinator or go to:
<http://ndupress.ndu.edu/About/Essay-Competitions/>



Joint Integrative Solutions for Combat Casualty Care in a Pacific War at Sea

By Dion Moten, Bryan Teff, Michael Pyle, Gerald Delk, and Randel Clark

Brigadier General Dion Moten, USAR, is Deputy Commanding General of 335th Signal Command (Theater) in East Point, Georgia. Colonel Bryan Teff, ANG, is Wing Commander of the 110th Attack Wing in Battle Creek, Michigan. Colonel Michael Pyle, USAR, is Deputy Assistant Chief of Staff, Warrior Transition, at Joint Base Lewis-McChord. Commander Gerald Delk, USNR, is Deputy Surgeon, Second Fleet, in Norfolk, Virginia. Lieutenant Colonel Randel Clark, USAR, is Brigade Commander for the Mission Command Support Group, 88th Readiness Division, Fort McCoy, Wisconsin.

American maritime forces currently conduct theater security operations through rotating carrier strike groups in the Western Pacific where shadowing Chinese surface combatants hinder and harass their activities. Given China's militarization of the South China Sea, escalation of tension and conflict are all but inevitable. Although current engagements and interactions with our competitors in the Western Pacific fall short of open military conflict, a war at sea (WAS) in which maritime adversaries fight for sea control appears probable. Integration of scalable, adaptive joint force medical capabilities will address our lack of preparedness, together with those impediments encountered in providing combat casualty treatment in a contentious disseminated maritime environment, such as a WAS.

Ensuring regional stability in the Pacific theater is a national security

priority complicated by unique components threatening U.S. expeditionary forces, such as China's rise as a global competitor possessing multidomain anti-access/area denial (A2/AD) capabilities. The joint force must stand prepared to deter competitors and defeat any adversarial threat across the full range of military operations by employing "concepts and capabilities to win without assured dominance in air, maritime, land, space, and cyberspace domains."¹ The health service support mission must follow suit, aligning with the operational joint force across the full spectrum of warfare. They must be trained, manned, and equipped to render lifesaving resuscitative and health-sustaining capabilities to engaged warfighters in all domains and operational environments.² We address (1) the rationale for preparing for a Pacific WAS; (2) doctrinal guidance from lessons learned in combat casualty planning in U.S. Central Command (USCENTCOM); and (3) utilization of joint integrative solutions critical to maintaining a competitive advantage with casualty treatment when supporting contentious maritime operations.

Preparing for a Mass Casualty Scenario

Current National Security Strategy (NSS) guides U.S. defense of our global security interests, assessing China's portentous emergence both as a global competitor and within the international order. China's singular determination to dominate world markets leads it, inexorably, seaward. Its expansion threatens the sovereignty of our partner nations and hinders our freedom of maneuver and access to the Western Pacific. China's actions warrant expeditionary forces prepared to deter aggression while safeguarding collective interests abroad. In response to U.S. theater security operations, the People's Liberation Army Navy (PLAN) has continued to implement concepts of classical Western maritime strategists from Alfred Thayer Mahan and Sir Julian Corbett in defense.³ China's maritime strategy includes aggressively building military outposts on the Spratly Islands

in the South China Sea and accelerating modernization of its maritime capabilities.⁴ Through expansion of sea control to the First Island Chain (Inner), China is postured to preserve its economic resources at sea, restrict the free flow of maritime commerce, and deter adversaries from threatening its sovereignty.

China's multidomain capabilities present a formidable A2/AD strategy comprising missiles, submarines, and fighter aircraft poised to both intimidate and exploit vulnerabilities of forward postured U.S. maritime forces.⁵ According to one analysis, "Chinese military writings suggest that in the event of conflict, they would conduct large-scale preemptive attacks designed to inflict severe damage on U.S. forces based or operating in the Western Pacific."⁶ Until the PLAN is prepared to contest sea control to the Second Island Chain (Outer), China is braced to do so through employment of integrative multidomain A2/AD capabilities. Should a WAS commence, the environment within the Second Island Chain is further convoluted by the tyranny of distance and time inherent to the enormity and geophysical features of the Pacific theater.⁷

A multidomain, multifunctional environment in the Western Pacific inhibits the transfer of health service support planning and processes from land-based conflicts to a WAS. China's maritime strategy, along with its continued advances in military armament and capabilities, can viably generate a mass casualty scenario at sea. Lack of preparedness and shortfalls with our current combat casualty treatment plans and capabilities for a potential WAS expose us to the loss of hundreds, if not thousands, of Servicemembers in the event a ship is critically damaged. Maritime commanders must therefore balance coordination of healthcare support with maneuver warfare and force protection efforts with disseminated operations in a contested environment.

Applying Lessons Learned in Combat Casualty Care

Military operations have increasingly become more dispersed, disaggregated,

and complex, most notably throughout USCENTCOM over the last decade. In support, the joint force adapted its medical capabilities into more flexible, versatile, and scalable platforms. In 2009, Defense Secretary Robert M. Gates traveled throughout Afghanistan, observing the level of care afforded wounded Servicemembers. Following his battlefield circulation, he ordered casualty treatment to occur within the "golden hour" to mirror treatment administered in Iraq.⁸ The golden hour directive emerged as strict policy that wounded Servicemembers receive resuscitative and surgical care within an hour from the moment of injury. This soon became doctrinal as the medical literature demonstrated improved patient outcomes when combat injuries were properly treated in the first several minutes combined with high-quality en route care during patient evacuation.⁹ To support this requirement for even more disaggregated operations, our medical platforms scaled down further while increasing mobility and adaptability in order to deliver advanced care within this golden hour. By forward positioning of damage control resuscitation (DCR) and damage control surgical (DCS) capabilities and enhancement of aeromedical evacuation (AE) assets, the medical forces increased responsiveness to meet operational needs. Ultimately, the rapid removal of casualties from the battlefield and early surgical intervention vastly improved survival rates.

Despite advances in trauma stabilization, resuscitation protocols, and evacuation procedures improving survival rates from combat injuries, implementation of these improvements within the context of WAS will be impeded by our competitors' cross-domain offensive capabilities. Given the austere conditions and the vast area of operations involved in the Western Pacific, our maritime forces require freedom of maneuverability to counter China's A2/AD capabilities. The golden hour requirement applied to the Western Pacific theater will be more difficult to achieve related to challenges inherent to a WAS. Our joint force must, therefore, determine what capability gaps

remain and how best to circumvent any obstruction to access throughout the combat casualty care continuum through joint integrative solutions.

Integrative Solutions for Casualty Care Support

Executing a health service support plan commensurate with a mass casualty scenario in the Western Pacific requires innovative solutions and the integration of the following joint force medical packages and capabilities. We next discuss the following six proposed solutions for mitigating the complexities in delivering combat casualty care in a WAS:

- allocation of additional forward surgical resuscitative trauma packages (Role II capabilities) aboard surface combatant ships to provide care within the golden hour
- employment of maneuverable afloat Role III *Mercy*-class hospital ships
- adaptation of Combat Logistics Force (CLF) platforms within the seabasing concept for augmentation of afloat Role II/III capabilities
- integration of expeditionary adaptive force medical packages afloat and ashore
- commitment to the delivery of dedicated medical evacuation (MEDEVAC) platforms for patient recovery and evacuation from the sea
- delegation of responsibility to a medical command and control system required for regulating and coordinating patient movement from point of injury to definitive care treatment facilities.

It is imperative that the joint functional commander (JFC) provide the necessary forward resuscitative/surgical platforms and dedicated medical evacuation assets with the capacities suitable to transporting large numbers of casualties expeditiously without limiting maritime forces engaged in sea control operations.

Golden Hour Mitigation Through Forward Postured Role II Capabilities

In a WAS, limited availability of damage control resuscitative and surgical capabilities, lack of dedicated MEDEVAC assets, and adversarial A2/AD efforts will cripple maritime medical planning to guarantee care within the golden hour. Lack of sea control and air superiority will further impede “the application of a ‘Golden Hour’ standard in a medical treatment/evacuation paradigm.”¹⁰ Component commanders innately hold Service responsibility for treatment and evacuation of casualties from the point of injury to a dedicated Role I or Role II facility.¹¹ Normally, each ship within a maritime task force has limited Role I capability and is ill-equipped to contend with multiple casualties from a major shipboard incident at sea. A surface commander is also currently hampered by coordinating medical support through surface or air lifts of opportunity since the Navy has no dedicated MEDEVAC capabilities. Thus, a maritime task force commander (TFC) would typically be limited to supporting surface commanders and subordinate ships with major damage and multiple casualties by air or sea evacuation to the nearest Role II capability. These surgical capabilities have limited capacity and are typically limited to employment on carriers in a Carrier Strike Group or on large-deck amphibious platforms as part of an Expeditionary Strike Group. In a contested environment, a decision to medically support subordinate ships becomes more perilous if sea control or air superiority has not been established. Given the limited means to stabilize and manage complex trauma patients, the addition of added forward placed surgical capabilities on non doctrinal surface ships could satisfy the golden hour mandate while alleviating the need for the TFC to redirect combatant assets to health support missions.

The forward surgical team (FST), expeditionary resuscitative surgical system, forward resuscitative surgical system, and Role II light maneuver team constitute

variable damage control surgical Role II capabilities within the Navy inventory and can be incorporated on surface combatant ships to deliver treatment within the golden hour. Scarcity of these packages obliges the JFC to consider other Service components for augmentation and sustainable requirements and should, therefore, consider employing medical resources across the entire joint force through globally integrated health services, defined as “the strategic management and global synchronization of joint operational health services that are sufficiently modular, interoperable, and networked to enable their quick and efficient combination and synchronization by a JFC.”¹² Through integrated joint operations, we can palliate critical gaps and shortfalls with purely Navy-centric Role II capabilities available to sustain disseminated maritime operations by augmentation from other Service components’ DCR/DCS medical packages.

Fortunately, the Army and Air Force have followed suit with their operational forces as well by becoming more expeditionary and adaptable in nature. The recent transformation of the Army and Air Force medical units toward scalable resuscitative and surgical platforms aligns with current Navy and Marine Corps concepts supporting expeditionary operations. Although typically deployed on land, the Army-based FST, as well as the Air Force-based mobile forward surgical team, small portable expeditionary aeromedical rapid response teams, and expeditionary medical support system (EMEDS) Basic Role II teams could be positioned afloat since they provide similar limited DCR/DCS capabilities.¹³ Their basic composition and similar footprint provide a suitable solution and sustainment resource for supporting disseminated maritime operations with an afloat Role II capability.

Forward placement of advanced damage control resuscitative and surgical capabilities on surface vessels not typically allocated Role II capabilities from any of the Service components could attenuate expectations for treatment within the golden hour. However, delays in patient transport after initial



Aviation boatswain's mate (handling) prepares to enter simulated casualty environment while wearing "hot suit" in USS *John C. Stennis's* hangar bay during general quarters drill, Bremerton, Washington, July 27, 2017 (U.S. Navy/Luke Moyer)

resuscitation to Role III facilities inexorably decreases survival rates due to lack of MEDEVAC capabilities. Complexity of disseminated operations in the Western Pacific combined with the tyranny of distance and time constrains the JFC to plan for forward placement of dedicated MEDEVAC and Role III capabilities to achieve casualty survival. This could be accomplished through maneuvering *Mercy*-class hospital ships or by careful positioning of expeditionary medical units afloat or ashore to support the Role II capabilities positioned on surface combatant ships engaged at sea.

Afloat Role III Capabilities in Support of Disseminated Maritime Operations

Complications arising from lack of sea control must be reduced before accepting the risk inherent in employ-

ing the Navy's limited *Mercy*-class hospital Role III platforms within the operational reach of a combative environment. Historically, the hospital ships are the only war-proven solution for compensating for the time and distance concerns in a war in the Pacific. During the initial phases of World War II, Vice Admiral William Halsey converted floating ambulances into acute surgical hospitals staged near proposed amphibious landing sites. This tactile conversion "proved successful, and despite more than 21,000 casualties at Iwo Jima, the care and evacuation of casualties was handled better than any previous operation in the central Pacific area."¹⁴ Given their maneuverability, proficiency with advanced surgical and medical care, and capacity to treat large volumes of combat casualties, they remain our only proven proficient afloat Role III capability.

The U.S. Navy currently has two *Mercy*-class hospital ships in its inventory, USNS *Mercy* and USNS *Comfort*, operated by Military Sealift Command (MSC). Each is capable of rendering "rapid, flexible, and scalable support to a specific requirement or mission as determined by the Combatant Commander" across the full range of military operations, including major contingency operations.¹⁵ Hospital ships provide requisite forward employed Role III medical care capabilities, vertical lift enabled flight decks capable of patient movement, and 30-day self-sustainment function. Each ship can support 12 surgical rooms, 100 intensive care beds, 400 intermediate care beds, and 500 minimal care beds dedicated to combat casualties anticipated from a WAS.¹⁶ Their large capacity to treat mass casualties sustained from major combat operations at sea makes them the ideal afloat Role III platform in any

theater. However, major engagements between conventional naval powers to achieve sea control last occurred during World War II; therefore, there exists no contemporary risk assessment on the forward employment of hospital ships for major combat operations.¹⁷ Despite their past performance and current capability and capacity for mass casualty treatment, many view the hospital ship platform as an anachronism ill-suited for a WAS in a contemporary multidomain environment.

Given the A2/AD capabilities possessed by China, the Navy must anticipate escalated risk to our hospital ships in a combative environment in which our adversary may regard them as opportune targets. Hospital ships display large red crosses signifying Geneva Convention protection; conversely, these emblems also invite attack, signaling lack of defensive countermeasures and symbolizing American power. Thus, hospital ships demand force protection assets and meticulous movement and maneuver consideration for operations in a contested environment. Despite these constraints, they proved invaluable in our last WAS as a Role III commodity. While 15 hospital ships operated at the end of World War II, only 2 such vessels remain in inventory, with discussions aimed at retiring one of them in the near future.¹⁸ Degradation of this unique, flexible, self-sufficient afloat medical platform for disseminated operations in the Pacific restricts available options for theater medical planning. Therefore, consideration of alternative concepts or innovative joint solutions to answer this degradation warrants careful consideration.

Augmenting Afloat Medical Capabilities

Seabasing is a joint integration concept for future operations that implements maneuverable, scalable, distributed, networked platforms that enable global power projection of offensive and defensive forces from the sea without reliance on land bases within a joint operational area.¹⁹ Seabasing's pillar emphasizes forward posture with prepositioned capabilities supporting and sustaining warfighting forces in

disseminated operations.²⁰ By providing a maneuverable defensive power projection shield, it can contribute support functions, including logistical sustainment, fire support, and health service support from the sea. It reduces requirements for intermediate staging bases or amassing large shore infrastructures, particularly during the early stages of combat operations.²¹ Seabasing allows maritime commanders the means to exploit fully sea maneuverability while extending the operational reach for support functions. This concept provides the JFC an innovative methodology that enables interoperability and augmentation of joint medical Role II and Role III medical capabilities from the sea.²²

Operationalization of the seabasing concept toward lines of effort supporting medical operations requires internal modifications and structure reconfiguration within the various support ships owned by Military Sealift Command. MSC employs various supply and service support ships attached under the CLF, as well as the Service and Command Support Force. The CLF imparts logistical support through underway replenishment of fuel, ordnance, food, and other supplies, as well as afloat medical facilities supporting Navy combatant ships worldwide.²³ However, they would require reconfiguration and restructuring before medical operations can be functionally executed while at sea. The Service and Command Support Force include the *Mercy*-class hospital ships, as well as Afloat Forward Staging Bases, Expeditionary Mobile Bases, and Expeditionary Fast Transports (EPFs). As with hospital ships, these service support ships use the sea as maneuver space to sustain fighting forces abroad where overseas access may be limited.²⁴ Their large capacities and ability to support vertical lift operations render them ideal alternative platforms as afloat Role II/III assets, if reconfigured to support combat casualty care operations. Although the MSC has multifunctional logistical capabilities, their ships would also require augmentation with medical personnel and equipment typically found in any of the Service component

expeditionary medical force packages. Before they can be redesignated as afloat medical capabilities, training and integration of the necessary medical force packages afloat must occur in conjunction with the certification exercises of the carrier and amphibious strike groups.

The EPFs, previously known as Joint High Speed Vessels, could address two additional shortfalls with our current maritime combat casualty plan: personnel recovery and patient movement of mass casualties by sealift. The design and afloat characteristics of the EPFs make it a plausible sealift platform for personnel recovery and evacuation capability of mass casualties that the Navy currently lacks. Currently, they are designed for rapid transport of personnel and supplies for maritime operations, and they even complement the hospital ship during humanitarian assistance missions, such as Pacific Partnership within the U.S. Indo-Pacific Command area of responsibility. If reconstructed and assigned as an afloat forward surgical or en route care team, the EPFs could also provide rapid transportation of medical personnel, supplies, and even patients between ships assigned to a maritime task force. This could afford the maritime TFC an alternate course of action for delivering Role II and evacuation capabilities among subordinate ships critically damaged in a WAS. Designating the EPFs to health support missions should be seriously contemplated and exercised prior to a WAS. The EPFs assigned to MSC could “bridge the gap between low-speed sealift and high-speed airlift” while “enabling the rapid projection, agile maneuver, and sustainment of modular, tailored forces in response to a wide range of military contingencies.”²⁵

Whether MSC logistical forces engage with sustainment operations or reconfigure as secondary hospital ships, their capacity to provide expeditionary medical capabilities afloat is essential to compensate for the shortage of *Mercy*-class hospital ships. Adaptation of MSC vessels provides a solution for the evacuation and treatment of mass casualties likely to occur in a WAS. Unlike hospital ships, none of the nonmedical designated MSC vessels are protected under the



Sailors learn about negative pressure wound therapy during skin and wound care course aboard USNS *Mercy*, in support of upcoming Pacific Partnership 2018 missions, Pacific Ocean, May 14, 2018 (U.S. Navy/Cameron Pinske)

Geneva Convention, exposing them to air, surface, and subsurface strikes. Their exposed status mandates additional force protection and defensive capabilities by the JFC while they are employed in the contested environment. Until this capability as a health service support platform is viable, joint expeditionary Role III medical capabilities should be placed ashore within operational reach to support major contingency operations in the Western Pacific.

Integration of Joint Expeditionary Ashore Role III Medical Capabilities

Given the complexity of conventional, irregular, transnational, and hybrid threats that beset our national security interests globally, our joint force transformed to an expeditionary model. It stands ready, trained, and equipped to fight our adversaries abroad in austere

environments, without reliance on airfields, seaports, or other critical supporting infrastructures. Medical platforms from each Service component followed suit, buttressing military expeditionary operations with scalable, rapidly deployable, and highly mobile units trained and equipped to provide casualty care and preventive care globally.²⁶ An increased focus on maritime operations has shifted attention from open water to the littoral regions of the Second Island Chain, where the joint force will be challenged by China's A2/AD capabilities.²⁷ If conflict occurred, interoperable, integrated expeditionary medical units across all Service components would be required nearby ashore to support maritime operations occurring within the Second Island Chain. The forward posture of the maritime prepositioning ship (MPS) squadrons, consisting of various logistical support

ships, enables rapid delivery and assembly of expeditionary airfields and Role III medical facilities to remote locations within any theater. The MPS squadrons would enhance our medical response, reinforcing crisis response and major contingency operations in the littorals of the Pacific. Further, they boast logistic capabilities to support vertical and surface arrival and sustainment of personnel and equipment affecting medical operations without the requirement of air or port infrastructure.²⁸ The Role III expeditionary medical units from each Service are modular, promoting interoperability of tailored joint forces requisite to supporting operations threatened by A2/AD capabilities.²⁹ They would represent the highest level of medical care obtainable ashore that could support maritime operations within the Second Island Chain, while supplementing the capabilities of hospital ships.

The Navy EMF is configured as a mobile deployable Role III platform, affording theater hospitalization in a secured forward area of operation receiving patients “directly from combat areas in order to provide full resuscitation and emergency stabilizing surgery within the prescribed evacuation policy throughout the range of military operations.”³⁰ The Army-centric combat support hospital (CSH) administers identical Role III modular scalable capabilities, with evacuation capabilities generally absent from Navy EMFs. Land-based, it can strategically position in support of maritime efforts, thereby attenuating time and distance impediments to the casualty treatment continuum from the ship to definitive treatment facilities outside the combat zone. The Air Force also reconfigured its medical force into smaller and more adaptable packages across all levels of care. The EMEDS +25 forms the expeditionary equivalent to a Navy EMF and Army CSH, and its modularity allows it to be scaled as required to support contingency operations. Despite the Service component, all three can be enhanced with critical care transport and aeromedical force packages near expeditionary airfields, promoting patient movement to definitive treatment facilities with fixed-wing assets.³¹ With the forward employment of Role III medical capabilities to complement afloat Role II assets aboard surface combatant ships, a dedicated evacuation capability would still be required for patient movement between the different echelons of care to improve survival rates.

Medical Evacuation Capabilities in Support of Maritime Operations

The U.S. Navy has no dedicated MEDEVAC capabilities, either afloat or ashore, and must rely on casualty evacuation (CASEVAC) for patient movement from ship to ship or ship to shore.³² Within the contentious maritime environment, the TFC must decide between sea control operations to defeat the enemy or personnel recovery and CASEVAC missions to maximize survival rates of casualties at

sea. Employing assets for CASEVAC not only increases the risk level to the patients, since they are transported on combatant platforms subject to adversarial attack by A2/AD capabilities, but also demands the TFC to spend assets eliminating this risk in lieu of operations to achieve sea control.³³ A reduced Navy medical evacuation footprint combined with increased patient movement complications arising in a WAS “demand[s] a more interdependent medical community, improved interagency and multinational partnerships, and joint solutions.”³⁴ Delegation of responsibility to a supporting functional or Service component would enhance the flexibility and maneuverability required for disseminated sea control operations. Based on recent conflicts in USCENTCOM’s area of responsibility, assignment of this responsibility to the Army would be the ideal integrative solution based on their historical success.

According to Army Field Manual 1-546, *Shipboard Operations*, “In nearly every major conflict and operation since World War II, Army aviation has been assigned missions in the maritime environment, either basing off naval vessels for land attack or operating from ships for sustained overwater missions.”³⁵ Recently, the Army has been designated the intra-theater MEDEVAC authority because it is the primary Service component with dedicated air ambulances dispensing intra-theater AE between military treatment facilities.³⁶ MEDEVAC capabilities for removing all wounded Servicemembers from the battlefield within the golden hour were soon achieved by air ambulances operated primarily by Army and Air Force assets. Therefore, consideration should be given to exercising and employing Army rotary-wing platforms, as well as the Air Force search and rescue rotary-wing and the V-22 Osprey, to support mass casualty evacuation from the sea to alleviate Navy’s MEDEVAC capability gaps.

The success achieved on land further contributed to the degradation of training programs and failure to innovate advanced patient evacuation capabilities by the Navy. “The lack of paramedic

certification for Navy search and rescue medical technicians and Fleet Marine Force corpsmen serving as casualty evacuation flight medics calls into question whether the Service is fully prepared for a major war in which the force may not entirely control the battlespace.”³⁷ Lessons learned from joint operations along with current gaps in Navy MEDEVAC have resulted in the need for “non-USN/USMC helicopters to operate from USN ships for combat search and rescue, combat support operations, medical evacuation, personnel transfer, and logistic support.”³⁸ Given our competitor’s A2/AD capabilities and potential for inflicting mass casualties, the Navy must decide either to commit to development of a self-sufficient MEDEVAC capability, or facilitate joint training for deck-landing qualification required for integration of Army and Air Force medical evacuation capabilities required to support a WAS.

Joint AE and Command and Control Systems for a WAS

Each Service component in the joint force has basic casualty evacuation capability in a combat environment. In addition to MEDEVAC and CASEVAC provided by the Army and Navy, the Air Force provides intra- and inter-theater fixed-wing AE capabilities, with the primary mission of patient transport along the casualty care continuum.³⁹ The Air Force medical packages can operate as far forward as aircraft are able to conduct air operations, across the full range of military operations, and in all operating environments.⁴⁰ However, to be effective in supporting maritime operations in the Western Pacific, expeditionary airfields must be established within operational reach of the Second Island Chain. The Air Force AE system requires secure airfields able to support fixed-wing aircraft to execute patient evacuations from the Western Pacific, and placement should consider vulnerability to offensive attacks by China’s A2/AD capabilities. Although rotary wings will be utilized for ship-to-ship or ship-to-shore movement of patients, AE plans must integrate rotary- and fixed-wing assets with their



USNS *Comfort* on 11-week medical support mission to Central and South America as part of U.S. Southern Command's Enduring Promise initiative, October 10, 2018 (U.S. Navy/Daniel E. Gheesling)

associated command and control elements to coordinate patient movement from the sea to definitive treatment in the rear. Once expeditionary airfields can be protected, then a variety of evacuation airlift platforms, primarily C-130, KC-135, and C-17 aircraft, can be used to move patients from austere Role III locations.⁴¹ Using the Pacific region, significant airfield capacity to support intra-theater transport of casualties is located in Guam, Hawaii, Wake Island, and the Marshall Islands. In addition, these airfields support large aircraft required for the inter-theater AE mission, such as the KC-135 and C-17.

Despite the intra- and inter-theater AE capabilities possessed by the joint forces, communication and coordination of patient evacuation have been discouraging among the joint force in our recent conflicts in the Middle East.⁴²

Major contingency operations resulting in mass casualties in the maritime domain will stress the joint force communication and coordination gaps in AE. Clearly, it will be necessary to leverage the entire joint force to mitigate this command and control gap in order to effectively coordinate AE missions in a complex maritime battlefield. A joint theater trauma system “would embrace all aspects of trauma management, from prevention, training, and evaluation through all phases of care with command and control, as well as data collection, evaluation, research, and process improvement.”⁴³ The system would ensure management by a joint force medical command and control system required for coordinating patient evacuation from the combat zone. As an added benefit, if implemented properly, a joint theater trauma system would provide specialized training to the joint force

regarding automated patient evaluation decision tools. Current joint doctrine as it relates to AE and patient care requires modification in order to account for dynamic, contested environments such as a WAS.

Given the medical command and control capability of the Air Force, it would be the ideal Service provider for delegating this responsibility and oversight by the JFC. The Air Force provides an Air and Space Operations Center (AOC) capability at the operational level for command and control of air, space, and cyberspace operations. Within the Air Mobility Division of an AOC, an aeromedical evacuation control team (AECT) is assigned to plan and execute intra-theater AE missions. To support the forward user, the Air Force provides an aeromedical evacuation liaison team (AELT) to support the AE system in the form



Flight nurse and aeromedical technician course students care for simulated patient during aeromedical evacuation mission aboard C-130 mockup at Wright Patterson Air Force Base, Ohio, January 29, 2018 (U.S. Air Force/J.M. Eddins, Jr.)

of operational and clinical interface.⁴⁴ Integration of the AELT onboard the ship, or in expeditionary medical facilities, would supply direct communications to the end-user, ensuring a coordinated patient flow throughout the AE system. Inclusion of AELTs in the forward operations environment provides the means for effective patient movement coordination from the sea to definitive treatment facilities in the rear provided by the intra- and inter-theater AE mission. Inclusion of a joint theater trauma system and AECT/AELT integration in joint doctrine will result in a fully integrated AE system that is able to efficiently task and synchronize assets for the JFC to coordinate mass casualty evacuations in a WAS.

As forewarned by General Joseph Dunford, the joint force must seize the initiative through innovative joint solutions to stay ahead of a rapidly evolving

complex operations environment. The joint force must remain postured to deter global competitors and defeat any adversary across the full range of military operations. The most significant deficiencies within the current combat casualty care system in support of this requirement occur within a contentious maritime environment. China's advanced modernization of A2/AD capabilities and militarization of islands in the disputed seas of the Western Pacific test our ability to render casualty treatment and evacuation throughout the continuum of care.⁴⁵

To address hurdles uniquely inherent to a major conflict in the Western Pacific, the JFC can resolve the Navy's shortfalls through joint integration of scalable, adaptive joint force packages and capabilities. This includes incorporation of forward resuscitative and surgical Role II and Role III platforms, with dedication

of medical airlift and sealift evacuation capabilities required to expeditiously treat large numbers of maritime casualties anticipated in a WAS. This includes supplementing the flexibility and maneuverability of the limited *Mercy*-class hospital ships by augmentation of afloat capabilities through seabasing and redesignation of MSC vessels toward personnel recovery, patient evacuation, and delivery of afloat Role II/III medical care. Finally, given the complexity of coordinating patient evacuation from the sea during operations for sea control, incorporation of a medical command and control system, such as organized by the Air Force through its AECT and AELT teams, should be implemented. Regardless of theater, joint integration of medical capabilities is a viable solution to resolving the Navy's lack of preparedness while maintaining a competitive advantage over our competitors in a WAS. JFQ

Notes

¹ Joseph F. Dunford, "Strategic Challenges and Implications," *Joint Force Quarterly* 83 (4th Quarter 2016), 3.

² *Naval Operational Medicine Capabilities Handbook* (Falls Church, VA: Department of the Navy, 2013), 5.

³ Leendert Visser, "The Great Wall of Sand at Sea: Chinese Sea Power and Power Projection in the East and South China Sea" (master's thesis, Radboud University, December 29, 2016), 3, available at <<http://theses.ubn.ru.nl/handle/123456789/4981>>.

⁴ *National Security Strategy of the United States of America* (Washington, DC: The White House, December 2017), 48.

⁵ Amitai Etzioni, "Air Sea Battle: A Case Study in Structural Inattention and Subterranean Forces," *Armed Forces & Society*, September 14, 2014, 170.

⁶ Jan van Tol et al., *AirSea Battle: A Point-of-Departure Operational Concept* (Washington, DC: Center for Strategic and Budgetary Assessments, May 18, 2010), xiii.

⁷ *Ibid.*, 4.

⁸ Donna Miles, "Golden Hour Initiative Pays Off in Afghanistan," American Forces Press Service, May 4, 2011, available at <<http://archive.defense.gov/news/newsarticle.aspx?id=63808>>.

⁹ Joseph James Hudak III, "The Origins of the 'Golden Hour' of Medical Care and Its Applicability to Combat Medicine" (master's thesis, U.S. Army Command and General Staff College, 2015), 1.

¹⁰ Armed Forces Research Institute of Medical Sciences, *Joint Concept for Health Services (JCHS)* (Washington, DC: The Joint Staff, August 31, 2015), 5.

¹¹ Joint Publication (JP) 4-02, *Joint Health Services* (Washington, DC: The Joint Staff, December 11, 2017), A-6.

¹² *Joint Concept for Health Services*, 5.

¹³ *Emergency War Surgery* (Fort Sam Houston, TX: Borden Institute, U.S. Army Medical Department Center and School, 4th ed., 2013), 2-3 and 2-4.

¹⁴ David Lane, "Hospital Ship Doctrine in the United States Navy: The Halsey Effect on Scoop-and-Sail Tactic," *Military Medicine* 162, no. 6 (July 1997), 392.

¹⁵ OPNAV Instruction 3501.161D, *Required Operational Capabilities and Projected Operational Environment for T-AH 19 Mercy Class Hospital Ships* (Washington, DC: Chief of Naval Operations, November 8, 2011), Enclosure (1), 1.

¹⁶ *Naval Operational Medicine Capabilities Handbook*, 5.

¹⁷ van Tol et al., *AirSea Battle*, 3.

¹⁸ Lane, "Hospital Ship Doctrine in the United States Navy," 392.

¹⁹ *Seabasing Joint Integrating Concept Version 1.0* (Washington, DC: Department of Defense, August 2005), 53.

²⁰ *Navy Expeditionary Combat Command Expeditionary Medicine Concept of Operations* (Norfolk, VA: Navy Expeditionary Combat Command, October 2007), v.

²¹ *Seabasing Joint Integrating Concept Version 1.0*, 18.

²² *Ibid.*, 5.

²³ *The U.S. Navy's Military Sealift Command 2016 Handbook* (Norfolk, VA: Military Sealift Command), 13.

²⁴ *Naval Operations Concept 2010: Implementing the Maritime Strategy* (Washington, DC: Departments of the Navy, Marine Corps, and Coast Guard, 2010), 90.

²⁵ "Expeditionary Fast Transport (EPF)," Fact File, Navy.mil, available at <www.navy.mil/navydata/fact_display.asp?cid=4200&ctid=1100&ct=4>.

²⁶ *Navy Expeditionary Combat Command Expeditionary Medicine Concept of Operations*, 6.

²⁷ Armon A. Cioppa, *Seabasing: A Joint Projection Platform*, Strategy Research Project (Carlisle Barracks, PA: U.S. Army War College, 2007), 3.

²⁸ *Naval Operations Concept 2010*, 86.

²⁹ *Emergency War Surgery*, 2-6.

³⁰ *Naval Operational Medicine Capabilities Handbook*, 6.

³¹ *Emergency War Surgery*, 2-8.

³² JP 4-02, *Joint Health Services*, A-6.

³³ *Ibid.*, A-9.

³⁴ *Ibid.*, A-2.

³⁵ U.S. Army Field Manual (FM) 1-564, *Shipboard Operations* (Washington, DC: Headquarters Department of the Army, June 29, 1997), 1-1.

³⁶ JP 4-02, *Joint Health Services*, A-6.

³⁷ Shawn Snow, "Putting Marines at Risk: How Shocking Flight Medic Training Gaps Could Endanger Grunts on the Ground," *Marine Corps Times*, May 8, 2018, available at <www.marinecorpstimes.com/news/your-marine-corps/2018/05/08/putting-marines-at-risk-how-shocking-flight-medic-training-gaps-could-endanger-grunts-on-the-ground/>.

³⁸ FM 1-564, *Shipboard Operations*, H-1.

³⁹ JP 4-02.2, *Joint Tactics, Techniques, and Procedures for Patient Movement in Joint Operations* (Washington, DC: The Joint Staff, December 30, 1996).

⁴⁰ Air Force Instruction (AFI) 11-2AE, Volume 3, *Aeromedical Evacuation (AE) Operations Procedures* (Washington, DC: Department of the Air Force, August 15, 2014).

⁴¹ *Ibid.*

⁴² Arthur M. Smith and Harold R. Bohman, "Medical Command and Control in Sea-Based Operations," *Journal of Military and Veterans' Health* 15, no. 3 (2006), 23.

⁴³ *Ibid.*, 24.

⁴⁴ AFI 48-307, Volume 1, *En Route Care and Aeromedical Evacuation Medical Operations* (Washington, DC: Department of the Air Force, January 9, 2017).

⁴⁵ Joseph F. Dunford, "The Character of War and Strategic Landscape Have Changed," *Joint Force Quarterly* 89 (2nd Quarter 2018), 2.

New from NDU Press

for the Center for Strategic Research

Strategic Forum 300

Baltics Left of Bang: The Role of NATO in Denial-Based Deterrence

By Robert M. Klein, Stefan Lundqvist, Ed Sumangil, and Ulrica Pettersson



NATO's military contribution to deter Russian aggression in the Baltic region should begin with an overall

strategic concept that seamlessly transitions from deterrence through countering Russia's gray zone activities and onto conventional war, only if necessary. NATO should augment its ongoing program to enhance the denial-based deterrence for the region with threats of punishment that demonstrate to Russian leaders they cannot achieve their aims at acceptable costs. Rather than forward-position military forces forward in the Baltic states, NATO should consider keeping forces further back, taking advantage of strategic depth both to limit their vulnerability to Russian attack and increase operational flexibility. To support the overall denial-based deterrence concept, the Baltic states must commit wholeheartedly to the concept of total defense including significant increases to their active and reserves forces.



Visit the NDU Press Web site for more information on publications at ndupress.ndu.edu

Romanian soldier fires rocket propelled grenade at range near Bemowo Piskie Training Area, Poland, January 24, 2018, as part of multinational battle group comprised of U.S., UK, Croatian, and Romanian soldiers supporting NATO's Enhanced Forward Presence (U.S. Army/Andrew McNeil)



Ground Combat Overmatch Through Control of the Atmospheric Littoral

By George M. Dougherty

Colonel George M. Dougherty, USAF, is the Individual Mobilization Augmentee to the Deputy Assistant Secretary of the Air Force for Science, Technology, and Engineering, Office of the Assistant Secretary of the Air Force for Acquisition and Logistics, in Washington, DC.

The U.S. military is seeking disruptive innovations to sustain its technological advantage despite rapid advances by potential adversaries. The need is particularly acute in ground combat, where most U.S. casualties are sustained and where game-changing technical innovations have been less common than in other military mission areas.

The Search for Tactical Overmatch

In addition to increasing technological pressure, recent coalition combat experiences and defense studies suggest that the future battlefield will be more complex than in the past. Combat in built-up areas including megacities will become commonplace. As concluded by a recent report, “Urban operations in the 21st century are not just another

type of operation; they will become this century's signature form of warfare."¹ The pivotal battles in Iraq and Syria have been urban fights for cities like Fallujah, Mosul, and Raqqa. Whether conducted in urban areas or elsewhere, battles will involve proliferating low-cost lethality used by adversaries, such as improvised explosive devices of increasing sophistication, man-portable weapons like advanced rocket-propelled grenades and explosively formed penetrator warheads, and weaponized commercial drones.² While roles exist for elegant technologies like hypersonic weapons and other long-range stand-off fires, winning future conflicts will ultimately require tactical overmatch in close battles in the land domain.

The use of robotics and autonomy offers great but undefined potential. New innovations in this area could build on the U.S. military's early technological and operational lead in unmanned systems. They would also capitalize on U.S. advantages in battlefield networking, logistics, and technical training, and could help frustrate enemy attempts to bleed away American political will by inflicting U.S. casualties. Most concepts to date involve straight-forward substitutions of unmanned or manned platforms within current concepts of operations—for instance, unmanned strike fighters to serve as “wingmen” to manned strike aircraft,³ explosive ordnance disposal robots,⁴ robotic “pack mules,”⁵ autonomous trucks⁶ for carrying supplies, and armed ground robots to provide remote-controlled gun firing positions.⁷ These are all ways of better enabling existing military capabilities. However, they may not provide decisive overmatch for U.S. forces. Could the inherent capabilities of robotics and autonomy bring entirely new operational concepts to the battlefield? Looking beyond immediate technical limitations, what new capabilities and combat doctrine could these technologies enable to provide disruptive tactical overmatch in the battles to come? One example is proposed here.

Atmospheric Littoral Operations

To date, official U.S. military thinking regarding future direct applica-

tion of robotics and autonomy to the land domain has focused largely on unmanned ground vehicles. This emphasis is seen, for instance, in the *U.S. Army Robotic and Autonomous Systems Strategy*, which envisions a ground vehicle-centric approach extending through the far-term horizon of the 2030s and beyond.⁸ However, these vehicles will face the physical complexity of the future battlefield, in particular, the environment in which they need to navigate. The most advanced contemporary autonomous ground robots have had mishaps navigating relatively simple terrain. At the Defense Advanced Research Projects Agency Robotics Challenge in 2015, autonomous robots in complex environments struggled at length to accomplish the most basic tasks that humans find trivial, like moving over uneven ground and opening doors.⁹ In another example during 2017, a security surveillance robot toppled into the fountain in an office park plaza.¹⁰ The terrain of an urban battlescape, as seen in recent battles in Iraq and Syria, can be vastly more complex—a jumble of obstacles including barricades, debris from damaged structures, craters, and wrecked vehicles. Even with navigation using artificial intelligence (AI) generations beyond that of current self-driving cars, or with continuous remote control by a human operator, the physical obstacles are likely to impede any ground robot.

Elevate the plane of movement perhaps 10 meters up, however, and all is nearly as smooth as the floor of a laboratory. Flying drones can operate at this level but remain intimately engaged in ground combat. They are effectively ground forces, but they operate in the air with the tactical advantages of airpower. They operate in what can be called the *atmospheric littoral*, the portion of the atmosphere adjacent to the Earth. In terms of future military operations, it is where the following conditions apply:

- Operations are conducted in the air, high enough that most ground obstacles are of no consequence and

forces can move, concentrate, and disperse without hindrance, much like aircraft but on a local scale.

- Operations are conducted low enough that the forces are in close and intimate contact with ground forces, able to attack enemy ground forces or support friendly ones in ways that other ground forces cannot.
- Operations are conducted low enough that the forces can use large features such as buildings, hills, or large trees as cover and concealment.

In shorthand, it can be thought of as “the air between the buildings” and may extend to an altitude of a few hundred feet. Contemporary helicopters often operate in the atmospheric littoral but tend not to remain there for long in combat because they are vulnerable to enemy fire at that altitude, and their size—required for carrying human pilots and passengers—prevents them from maneuvering safely or effectively between buildings and trees or along streets. Once they are high enough to be out of danger from enemy small-arms fire, they are, tactically speaking, out of the atmospheric littoral.

Advantages of the Atmospheric Littoral

Combat operations in the atmospheric littoral may provide disruptive new military capability and overmatch for ground forces. They effectively expand the ground combat battlespace at the small-unit level from two dimensions to three. This could open up a whole new dimension of tactical maneuver. For instance, instead of flanking an enemy force on the next street by moving down side streets, the force could send elements “up and over” an intervening block to flank an opposing force from above.

The ability of atmospheric littoral forces to maneuver in the third dimension, and the freedom from ground obstacles that this enables, could provide several pervasive advantages:

- Speed. As with air forces, movement through the air is fast and unobstructed, so forces could be

sent quickly to achieve time-sensitive objectives, like cutting off a withdrawing enemy's route of escape.

- **Concentration.** As with air forces, the ability to move independently of terrain and other ground forces enables the commander to concentrate combat power at the decisive time and place within the battlespace, even if physically separated from other friendly forces.
- **Persistence.** As with ground forces, atmospheric littoral forces could seize and control terrain. Operating in close contact with the ground, they could land and remain in place for long periods to physically occupy objectives and deny their use to the enemy.
- **Mass.** Unlike other forces, they could be arbitrarily arranged in space, enabling a unique concentration of firepower. For instance, arraying forces in the third dimension could enable a range of platforms at different altitudes to all have sustained direct-fire solutions on the enemy at the same moment.

A further advantage of atmospheric littoral operations is that they are expected to be complementary to, and integrate with, other ground unit operations. Littoral combat forces could be attached to other ground units under the same commander to serve as an organic force multiplier in combined-arms operations.

Doctrinal concepts for atmospheric littoral operations are influenced by several sources, considering their multi-domain nature. These include airpower theory, small-unit tactics from the land domain, and air-mobile/air assault doctrine.

Characteristics of Weapons Systems

Operations in the atmospheric littoral have not been possible in the past because no suitable platforms have been technically possible. Characteristics of a capable atmospheric littoral combat platform include the following:

- **Three-axis maneuverability.** Ability to maneuver in the air up to an altitude of several hundred feet, move along multiple axes, or remain stationary. This effectively rules out fixed-wing aircraft.
- **Small size.** Small enough to maneuver effectively between buildings, trees, and other tall obstacles like cell towers and power lines. This effectively rules out human-piloted vehicles.
- **Usable payload.** Large enough to carry light infantry, man-portable-class weapons with significant lethality.
- **Control.** Equipped with sensors and communications to be able to sense their environment, report their circumstances, and accept command and control.
- **Autonomy.** Autonomous enough to manage their own stability, navigation, and other functions without continuous human control. Capable of collective control of many platforms by a single "operator," including coordinated action as a group.
- **Endurance.** Sufficient endurance to conduct meaningful combat operations on the timescale of small-unit engagements and return to a logistics point before running out of energy. About 30 minutes may be a practical minimum, with an ability to return immediately to operations after visiting the logistics point.

A large contemporary quad-rotor or hex-rotor drone is the first platform with the basic characteristics suitable for atmospheric littoral combat. Drones of the required size are being demonstrated today, for instance as part of the Army Research Laboratory's Joint Tactical Aerial Resupply Vehicle technology program, which targets a cargo capacity of 200 pounds or more.¹¹ Future platforms with different modes of propulsion and other qualities could offer greater capabilities in the future.

The Basic Unit of Operations

An individual drone of this type has limited survivability and lethality. Being

small, the individual platforms may be vulnerable to small-arms and other direct fires such as laser and high-power microwave drone defeat weapons, and will therefore rely on cover and maneuverability for their survivability.¹² This includes flying at very low altitudes (~10 meters). Being too small to carry a human pilot, they will be able to carry light weapons loads comparable to those of an individual soldier—for instance, an assault or squad automatic rifle and/or compact tube-launched direct-attack munitions. An individual platform therefore may be comparable to one or a few infantry soldiers in combat power.

Combining multiple platforms, however, yields an aggregate that can provide significant survivability and lethality. The loss of a single drone would only marginally degrade the capability of the whole, and the ability to mass the firepower of a group could bring substantial combat power to bear.

In current usage, a group of unmanned systems operating together is called a *swarm*. This implies a loose aggregation with a lot of random positioning, like an insect swarm, and may be consistent with public experience of small drones for pre-programmed light shows and similar entertainment.¹³ However, in military tactics it is unusual to speak of a swarm of soldiers, vehicles, or aircraft. To provide a sufficient level of discipline and control for combat in close coordination with friendly forces, a degree of order at least comparable to that of other ground forces is needed. In this context, a term such as *array* may be more accurate, indicating an ordered type of swarm where each element occupies a controlled position. Like other forces, a drone array can assume different tactical formations depending on the task it is performing. This degree of multiplatform coordination has been demonstrated using small commercial drones in controlled environments, including complex behaviors, such as quickly forming and reforming highly ordered formations and cooperating to move formations through constrictions such as doorways and reform them on the other side.¹⁴



RoboSimian from Jet Propulsion Laboratory exits vehicle during DARPA Robotics Challenge, June 5, 2015, in Pomona, California (U.S. Navy/John F. Williams)

The drone array, not the individual platform, would be the basic unit of atmospheric littoral operations. Command and control would be feasible with one human operating an array, with the many details of individual drone navigation, object avoidance, and so on handled autonomously. The array would move, attack, or change formation as a unit under human direction. When sustaining battle damage, the array would remain mission-capable despite the loss of some of its elements. It would simply reassemble its formation and conduct its operations using the remaining elements. It could undergo attrition gracefully. Due to its distributed nature, it would be hard to defeat with a single attack, no matter how forceful.

Tactical Employment

Drone arrays operating in the atmospheric littoral may offer ground forces

a powerful and flexible range of new options that provide decisive tactical advantage in both high- and low-intensity conflicts, suited to the complex environments expected in (near) future campaigns. The basic concept of operation envisions attachment to company- or battalion-level units operating in built-up areas, similar, for instance, to today's Stryker Brigade Combat Team infantry rifle companies or Marine infantry battalions. Roles can also be envisioned for arrays operating with a range of combat forces from special operations forces to heavier maneuver forces. The roles are applicable in both conventional and irregular warfare. Some examples of tactical employment for drone arrays include the following small-unit maneuvers:

- Movement to contact. Due to their high mobility and immunity to the

effects of terrain, drone arrays may be a highly effective covering force during movement to contact. They provide real-time intelligence, surveillance, and reconnaissance (ISR) information to the command unit. If a meeting engagement occurs, an array's mobility could enable it to react more quickly than the enemy to seize the initiative and fix the enemy forces to help shape the larger engagement. Friendly forces retain the option to disengage, since the array's mobility and attritability prevent it from being decisively engaged. It could withdraw at will.

- Shaping engagements. During an assault, a drone array could enter a built-up area before the arrival of follow-on forces in order to find and engage prepared enemy positions, provide suppressive fire, and drive enemy forces away from open



TALON robot, operated by Marines with Explosive Ordnance Disposal Platoon, Combat Logistics Battalion 2, scouts area for improvised explosive devices during field exercise at Camp Lejeune, North Carolina, March 2, 2016 (U.S. Marine Corps/Paul S. Martinez)

areas. It could also identify potential ambush locations and lay smoke screens. Because an array contains no human soldiers and is attritable, this could greatly reduce hazards to the assaulting forces and speed the engagement.

- Vertical envelopment. Operations in the atmospheric littoral provide tactical dominance because they allow friendly forces to maneuver in three dimensions while the enemy is confined to two. In addition to flanking envelopments, a drone array could move over the top of intervening buildings, hills, or other obstacles and conduct a vertical envelopment. This is particularly valuable when an enemy is in defilade—sheltering behind an obstacle or in a trench—but is without strong overhead cover. Unlike traditional air support, the array could maintain an enveloping

position, fix the enemy, and subject him to continuous fire.

- Infiltration and interdiction. An array is a dissociable unit and has the ability to concentrate or disperse at will. Because it can move without regard to terrain, its elements could move through or into locations that would ordinarily be inaccessible to friendly forces. Drones can filter individually through terrain and concentrate over enemy rear areas to conduct rear attacks, interdict enemy supplies or reinforcements, or attack command elements. They can disperse and reinfiltre back to friendly locations or, if desired, be left engaged until all the elements are expended without incurring friendly casualties.
- Decisive engagement. Atmospheric littoral operations provide the ability to concentrate firepower in three

dimensions to provide maximum lethality. When called for, a drone array could assume three-dimensional tactical formations to bring a unique number of converging direct fires into play. This could be done through vertical echeloning, for instance—by forming the elements into vertical ranks in a “wall” formation, or even taking a hemispherical formation to concentrate fire on a discrete target such as a fortified building.

- Area defense. Atmospheric littoral forces, like other ground forces, could help take and hold ground objectives. A drone array could land, thereby conserving power, and remain on station indefinitely to observe and defend a location and deny its use to enemy forces. If attacked, it could take to the air to engage in combat. Future drone

elements may even be able to change geometry when landed to optimize them for observation, energy harvesting, ground movement, or weapons employment while landed.

- Mobile defense and retrograde. The same capabilities provided for offensive maneuvers could provide overmatch in defensive situations. For instance, the ability of atmospheric littoral forces to rapidly move and concentrate makes them a potent reserve force. They enable defending friendly forces to quickly bring combat power to bear in response to an enemy attack at any point, even one separated by difficult terrain. Drone arrays may also provide effective defensive covering forces during retrograde movements, allowing the human forces to disengage, and then exfiltrating themselves at will.

Technical Challenges

Current platforms may be sufficient to start conducting limited experiments in atmospheric littoral operations. Making drone platforms more durable and mounting weapons are fairly straightforward challenges. But in order to be combat effective, the drones will need a number of new technical capabilities related to command and control, AI, and logistics. Military-specific research and development will need to be directed toward maturing these capabilities.

A common denominator to these challenges is the need to reduce the burden on human warfighters. Current unmanned systems can serve as high-value assets—for instance, as ISR platforms—but require too much human intervention for widespread use in ground combat. A soldier, or a combat vehicle including its crew, has to be able to carry out orders, feed or refuel, care for itself when it stumbles or suffers minor injury, and otherwise carry out basic functions without constant outside oversight. The same applies to drone arrays. The following challenges may be overcome with relatively near-term

advances in autonomy, but all will require some military-specific investment.

Command, Control, and Communications. Challenges in command and control include guiding multiple drones within an array and enabling effective human control of arrays. The technology has reached the point where many of these functions are feasible in the near term.

Autonomous swarm control has advanced to the point that external aids such as global positioning systems are no longer required for complex array behavior.¹⁵ Drones can navigate through complicated environments using visual and range data collected by miniature cameras, radar, and light distance and ranging sensors being commercialized for self-driving cars.¹⁶ This includes navigation through indoor environments including autonomous avoidance of obstacles¹⁷ and through outdoor environments as complex as forests.¹⁸ Recent advances, driven by applications like drone-based package delivery, include the ability to travel city streets and take navigational data from other vehicles.¹⁹

An array must be able to accept and interpret high-level commands similar in detail to those that might be given to a soldier or squad leader, such as “move to this intersection” or “attack this target until it is destroyed.” For the time being, it is likely to be easiest to give these commands electronically—for instance, by clicking on locations and objects on a live map of the battlespace. This level of control is already familiar and intuitive to a generation of real-time strategy gamers.

Human operator situational awareness, however, will require new development. Contemporary ground warfare, instead of becoming more automated and push-button, has seen the rise of the *three-block war* where decisions with delicate ethical, political, and even strategic consequences are required at the lowest ranks.²⁰ It will not be practical in the foreseeable future for arrays to understand the full complexity of their environment, and they may encounter unexpected obstacles or situations. They certainly cannot understand the nature of the conflict, exercise good judgment,

or uphold U.S. military values and laws of armed conflict on their own. Human control at a high level will remain essential, both to carry out their military missions effectively and to avoid mishaps, especially when weapons are being used. A human controller must be able to maintain positive situational awareness and control over the array as a whole. Therefore, interfaces must be developed that allow an operator to see what the array sees, to “look over its shoulder” and give it direction. A human controller may need to quickly switch his or her viewpoint from one array element to another as needed. Early technologies of this kind are being tested for operator control of multiple military ISR drones.²¹

All the command and control functions will require information-sharing and data fusion. Information will need to be shared between elements of the array in order for it to act as a single unit and for all the elements to see what any one sees. Similarly, it will be necessary for the array controller to work with a current version of the battle map and for the real-time information on the drones and their observations to update the battle map seen by the commander and other parts of the unit. This *combat cloud* is required with or without drone arrays. Secure encrypted data links and data fusion would be critical enablers of collective atmospheric littoral operations and could evolve along with other combat cloud applications.

As with all unmanned concepts, the security of communications is a consideration. Atmospheric littoral drone arrays could be subject to the same kinds of electronic warfare attack as other unmanned platforms. If communications are cut, they could return autonomously to their home location. However, due to their coordination with ground forces, the arrays could have an additional option. In the event of loss of a secure radio data channel, local communications with their controlling unit could be maintained using high-bandwidth, low-probability-of-intercept line-of-sight means, such as laser optical datalinks.²² Drone arrays will likely operate within a few kilometers or less of the base station,

within line-of-sight range. Commands such as “move here” or “destroy this target” could even be given by nearby forces using readily available laser target designators with the addition of optical encoding. In urban areas, optical data-links could be directed around corners by relay drones hovering in intersections. Such drones would be relatively simple compared to the combat drones they support.

Combat Artificial Intelligence.

Combat by semi-autonomous drone arrays will involve some specific AI challenges, even with the tougher issues of human judgment and decisionmaking handled by an operator. In order to accept and execute operator commands in a way that is predictable and understandable, at the speed of combat, several capabilities will be needed:

- Target acceptance. Automatic target recognition is the ability of a sensor system to recognize and flag potential targets based on predefined characteristics. Drone arrays will need a related but distinct ability to accept the designation of a target by the operator and understand the target’s boundaries and what it consists of: a static object, part of a static object (for example, a window of a building), a moving vehicle, an area, and so on.
- Target keeping. Drone arrays require the ability to keep the designation of a target despite movement or aspect changes, changes in lighting or weather, brief obscuration of the target behind an object or smoke screen, or the effects of weapons use. Without this ability, drones may constantly “lose lock” on the target or fall for simple tricks intended to confuse them. This is similar to the appreciation of object permanence, which is a key step in cognitive development for human infants.²³
- Target assessment. After attack, drones need the ability to determine whether their target has been destroyed so that attacks are not continued needlessly on an already

neutralized target or stopped before the target has been neutralized.

- Incoming fire awareness. Drone arrays will come under attack by enemy forces. To survive, they will need to be able to detect when a drone is under attack or has been destroyed and take appropriate defensive action, such as evasive movement, while alerting the operator.

When adversaries are able to field their own drone formations, combat AI will need to incorporate drone vs. drone combat. This may be simpler than ground combat in some ways, as the need for human judgment will be reduced and target recognition and assessment may be more straightforward. Academic researchers have already demonstrated autonomous swarm vs. swarm “dog-fights” using simulated weapons.²⁴

Logistics

Drones in an array will eventually run short of fuel, whether liquid or electric, and be depleted of ammunition. Autonomous combat logistics will be essential to keep the burden off the rest of the combat unit. Otherwise, efforts to support a drone array in sustained combat could absorb the attention of much of the rest of the unit that the array is supporting.

Like soldiers and manned vehicles, drone arrays need to be provided with replenishment locations, but otherwise they should be expected to refuel and rearm themselves, as common floor-sweeping robots recharge themselves today. One way this could be done is by providing pods, reservoirs of fuel and ammunition that could be dropped in locations close to the battle area but with some degree of sanctuary. In an urban combat scenario, they could be located a few blocks to the rear or in a physically inaccessible location like the roof of a building. They could be placed by large supply drones, similar to the current Joint Tactical Aerial Resupply Vehicle prototypes. The pods could be simple, such as a pressurized fuel bladder with a docking port on top or a frame covered with full weapon magazines and

rocket/missile tubes. The individual drones in the array could navigate to the appropriate pod, perhaps following a radio frequency or infrared beacon. Self-refueling could be achieved by deploying a fuel probe from the bottom of a drone, which could then hover atop a fuel pod, docked with the port, until its onboard tank is full. Self-rearming could involve discarding depleted magazines and rocket tubes and snapping new ones into place by landing on the ammunition pod.

At a modest speed of 30 miles per hour, in one minute a drone could be the distance of seven large city blocks to the rear, refueling and rearming at a logistics node, and in another minute be back in the fight. With this capability, the endurance of atmospheric littoral drones could be practically unlimited, as is the case today for combat aircraft provided with air-to-air refueling.

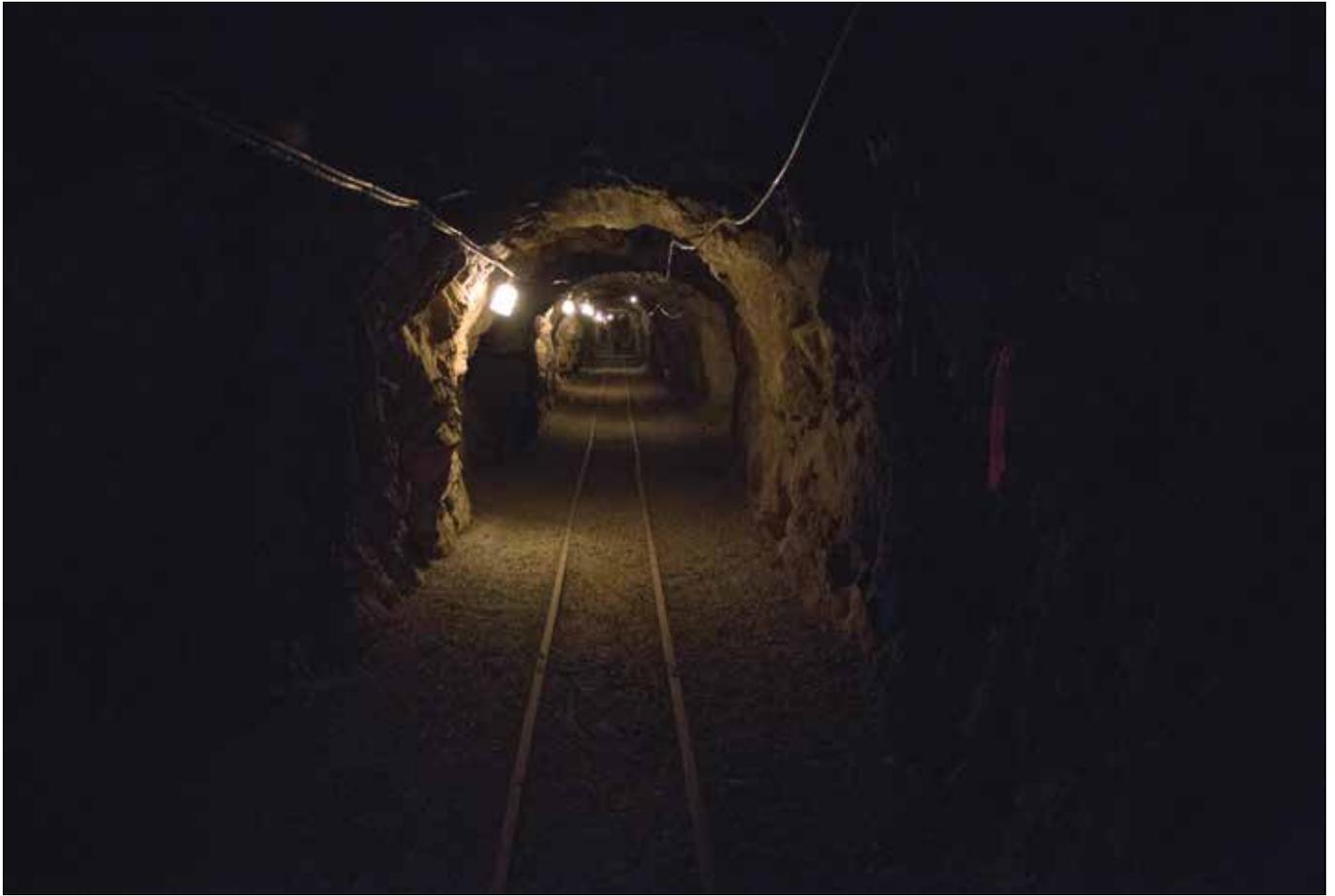
Self-repair is likely impractical, so to ease the burden, drones would need to be built for damage tolerance. They will need to absorb damage gracefully, through redundancy and by automatically compensating for damage where possible. The inherent redundancy of drones with four or more rotors could help with this. The ability of a fail-safe control system to partially compensate for a lost rotor has already been demonstrated.²⁵

None of the technical challenges described here are trivial. Much as with airpower and mechanized maneuver warfare, it may take many years of development before the technologies are fully able to realize operational hopes envisioned in the doctrine. But as in those cases, important military advantages could likely be gained with each step forward in capability.

Questions and Concerns

There are important concerns regarding the introduction of robotic combat systems. The doctrinal framework of exploiting the atmospheric littoral using drone arrays addresses several of these:

- Will they accidentally shoot the wrong things or run amok? Drone arrays have only limited autonomy, in keeping with a realistic view of



The DARPA Subterranean Challenge explores innovative approaches and new technologies to rapidly map, navigate, and search complex underground environments, Edgar Experimental Mine, April 2019 (DARPA/Colorado School of Mines)

the limitations of fully autonomous systems in complex environments. Authority to use weapons is provided and circumscribed by the human operators overseeing them and operating in coordination with them.

- Will they be a burden to operate in a combat situation? Autonomous logistics and the intuitive control of large numbers of platforms by a single operator are key aspects of the littoral operations concept. The burden can be even lower than with conventional weapons systems.
- Can other systems do the same things? Littoral drone arrays provide capabilities that are fundamentally unobtainable through existing means such as ground vehicles, manned aircraft, or large fixed-wing drones. The atmospheric littoral is a new tactical dimension open for exploitation.

- Will their communications be jammed? Relative proximity to friendly forces and to each other provides excellent fallback options if digital radio communications are unreliable. For instance, line-of-sight communications using laser datalinks could be both practical and intuitive and enable continued operations under the most severe jamming.

Next Steps

Realizing the military potential of autonomous robotics will involve more than just plugging unmanned systems into existing operational doctrine. It will likely involve a comprehensive set of changes similar to those that allowed the Army and Marine Corps to incorporate aviation starting in the late 1940s or to “own the night” starting in the 1970s. But the opportunities to force disruptive change on U.S. adversaries

and secure a lasting source of tactical overmatch may be greater still.

Atmospheric littoral operations are one example of how the inherent capabilities of unmanned systems and autonomy could enable overmatch, particularly for close combat in the land domain, where many conflicts of the coming decades are likely to be decided. A doctrine of exploiting control of the atmospheric littoral offers tactical advantages that provide a driving force for the adoption of robotic systems into ground combat. To adequately explore the potential, the next steps would be to focus technical research and development efforts on the areas described above and conduct military experiments to advance tactical experience and methods.

The necessary hardware technology is essentially available, and the software is advancing quickly. Fully mature technology is not needed up front; small



Lattice Modular Heli-Drone flies during test run of Lattice Platform Security System, at Red Beach training area, Marine Corps Base Camp Pendleton, California, November 8, 2018 (U.S. Marine Corps/Dylan Chagnon)

numbers of prototype militarized drones should be procured for experimentation and the results of the experiments used to refine requirements for the next generation of drones.

Key military questions, such as how best to coordinate with other small-unit actions and how much autonomy to allow, should be worked out on the training ground. The possibilities can be explored gradually and at low cost. The Army, Marine Corps, and other Services should establish programs to bring together the latest prototype hardware and software, new doctrinal concepts, and forward-thinking warfighters and allow the best approaches to be developed iteratively in realistic field experiments. This approach was used successfully in the past—for instance, within the Marines’ experimental helicopter unit, HMX-1, that started work in 1947 to explore

the military possibilities of rotary-wing aviation.²⁶

Since many combat advantages may be gained from the addition of a drone array to otherwise standard forces, advances could be seen with incremental changes to units or doctrine. Military forces could start small and increase their commitment as the possibilities are matured.

Soldiers and Marines are already encountering enemy forces fielding simple weaponized drones in urban combat. If U.S. forces do not master operations of this type, they may have to face enemies in the future who can fight in three dimensions. By pursuing a low-cost program of prototyping and experimentation, the U.S. military can lead the emerging combat capabilities offered by unmanned systems, avoid technological surprise, and enable a new era of sustained tactical overmatch. JFQ

Notes

¹ David Barno and Nora Bensahel, *The Future of the Army: Today, Tomorrow, and the Day after Tomorrow* (Washington, DC: Atlantic Council, September 2016), available at <www.atlanticcouncil.org/images/publications/Future_of_the_Army_web_0921.pdf>.

² Thomas Gibbons-Neff, “ISIS Drones Are Attacking U.S. Troops and Disrupting Airstrikes in Raqqa, Officials Say,” *Washington Post*, June 14, 2017, available at <www.washingtonpost.com/news/checkpoint/wp/2017/06/14/isis-drones-are-attacking-u-s-troops-and-disrupting-airstrikes-in-raqqa-officials-say/?utm_term=.30faf5e7b4f4>.

³ Kelsey D. Atherton, “The Future of the Air Force Is Fighter Pilots Leading Drone Swarms into Battle,” *Popular Science*, June 23, 2017, available at <www.popsci.com/future-air-force-fighters-leading-drone-swarms>.

⁴ Stefan Nitschke, “Explosive Ordnance Disposal and Decommissioning: Thinking Outside the Box,” *Military Technology*, September 2013, 88–90.

⁵ Stew Magnuson, “Robotic Mule Vendors Seek Opportunities Outside Military,” *National*

Defense, July 2013, 37.

⁶ Dan Parsons, "Army Wants Trucks to Drive without Troops," *National Defense*, July 2014, 12.

⁷ Ed Lopez, "Remote Lethality: Army Researchers Address a Host of Challenges," *Army Technology* 2, no. 6 (November/December 2014), 12–13, available at <www.army.mil/article/137493/remote_lethality_army_researchers_address_a_host_of_challenges>.

⁸ *The U.S. Army Robotic and Autonomous Systems Strategy* (Fort Eustis, VA: U.S. Army Training and Doctrine Command, March 2017), available at <www.arcic.army.mil/App_Documents/RAS_Strategy.pdf>.

⁹ Erik Sofge, "The DARPA Robotics Challenge Was a Bust," *Popular Science*, July 6, 2015, available at <www.popsoci.com/darpa-robotics-challenge-was-bust-why-darpa-needs-try-again>.

¹⁰ Todd C. Frankel, "A Security Robot Fell into a Fountain at a D.C. Office Building. And the Internet Went Wild," *Washington Post*, July 17, 2017, available at <www.washingtonpost.com/news/the-switch/wp/2017/07/17/a-security-robot-fell-into-a-water-fountain-at-a-d-c-office-building-and-the-internet-went-wild/>.

¹¹ Charlsy Panzino, "Army, Marine Corps Developing UAV for Faster, Safer Resupply Missions," *Army Times*, February 15, 2017, available at <www.armytimes.com/news/your-army/2017/02/15/army-marine-corps-developing-uav-for-faster-safer-resupply-missions/>.

¹² Christian Davenport, "How the Pentagon Is Preparing for the Coming Drone Wars: As Dangers Increase, the U.S. Military Is Seeking Ways to Knock Them Out of the Sky," *Washington Post*, November 24, 2017, available at <www.washingtonpost.com/business/economy/how-the-pentagon-is-preparing-for-the-coming-drone-wars/2017/11/24/3e4ff736-cfd1-11e7-81bc-c55a220c8cbe_story.html>.

¹³ Brian Barrett, "Inside the Olympics Opening Ceremony World-Record Drone Show," *Wired*, February 9, 2018, available at <www.wired.com/story/olympics-opening-ceremony-drone-show/>.

¹⁴ Alex Kushleyev, Daniel Mellinger, and Vijay Kumar, "Towards a Swarm of Agile Micro Quadrotors," *Autonomous Robots* 35, no. 4 (November 2013), 287–300, available at <<https://doi.org/10.1007/s10514-013-9349-9>>.

¹⁵ Evan Ackerman, "This Autonomous Quadrotor Swarm Doesn't Need GPS," *IEEE Spectrum*, December 27, 2017, available at <<https://spectrum.ieee.org/automaton/robotics/drones/this-autonomous-quadrotor-swarm-doesnt-need-gps>>.

¹⁶ Shaojie Shen et al., "Vision-Based State Estimation for Autonomous Rotorcraft MAVs in Complex Environments," 2013 IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May 6–10, 2013.

¹⁷ Lora Kolodny, "Exyn Unveils AI to

Help Drones Fly Autonomously, Even Indoors or Off the Grid," *TechCrunch*, February 21, 2017, available at <<https://techcrunch.com/2017/02/21/exyn-unveils-ai-to-help-drones-fly-autonomously-even-indoors-or-off-the-grid/>>.

¹⁸ "Battlefield Game Changer: Autonomous Drones Engineered for Tactical Advantage," *Airman Magazine*, July 2017, 1.

¹⁹ Antonio Loquercio et al., "Drones: Learning to Fly by Driving," *IEEE Robotics and Automation Letters* 3, no. 2 (April 2018), 1088–1095.

²⁰ Charles C. Krulak, "The Strategic Corporal: Leadership in the Three Block War," *Leatherneck* 83, no. 2 (January 1999), available at <www.au.af.mil/au/awc/awgate/usmc/strategic_corporal.htm>.

²¹ Gloria L. Calhoun and Mark H. Draper, "Display and Control Concepts for Multi-UAV Applications," in *Handbook of Unmanned Aerial Vehicles*, ed. Kimon P. Valavanis and George J. Vachtsevanos (Dordrecht, Netherlands: Springer, 2015), 2443–2473.

²² Eric Tegler, "Why Talk to Drones over Radio When You Can Use Lasers?" *Popular Mechanics*, March 18, 2016, available at <www.popularmechanics.com/flight/drones/a19999/laser-communication-drones/>.

²³ Gillian Fournier, "Object Permanence," PsychCentral online Encyclopedia of Psychology, available at <<https://psychcentral.com/encyclopedia/object-permanence/>>.

²⁴ Javier Chagoya, "NPS, Academic Partners Take to the Skies in First-Ever UAV Swarm Dogfight," Naval Postgraduate School press release, February 22, 2017, available at <<https://my.nps.edu/-/nps-academic-partners-take-to-the-skies-in-first-ever-uav-swarm-dogfig-1>>.

²⁵ Evan Ackerman, "Every Quadrotor Needs This Amazing Failsafe Software," *IEEE Spectrum*, March 4, 2014, available at <<https://spectrum.ieee.org/automaton/robotics/drones/every-quadrotor-needs-this-amazing-failsafe-software>>.

²⁶ Chuck Lloyd and Rick Llinares, "HMX-1: The First and Finest," *Naval Aviation News* 79, no. 4 (May/June 1997), 12.

New from NDU Press

for the Center for Strategic Research

Strategic Forum 301

The Enduring Relevance of the U.S.-Japan Strategic Alliance

By James J. Przystup



The U.S.-Japan relationship is, at its core, strategic, anchored in the U.S.-Japan Security Alliance. The

significant bilateral trade frictions of 2017–2018 have not adversely affected the alliance to date. Faced with an ongoing period of global instability and uncertainty, the alliance has continued to evolve to meet the challenges of the 21st century. Today, the alliance enjoys broad popular support in both countries, and both governments have been updating and upgrading key elements of this important strategic partnership. President Donald Trump's December 2017 National Security Strategy reaffirmed U.S. commitment to the alliance. Prime Minister Shinzo Abe has taken steps to enhance Japan's defense capabilities to allow the country to deal more effectively with the serious security challenges posed by North Korea and China, as well as to allow Japan to address the broadening challenges to the existing rules-based international economic and security order.



Visit the NDU Press Web site for more information on publications at ndupress.ndu.edu



Two U.S. Air Force B-1B Lancers assigned to 9th Expeditionary Bomb Squadron, deployed from Dyess Air Force Base, Texas, fly with Koku Jieitai F-2 fighter jet over East China Sea, July 7, 2017 (Courtesy Japan Air Self-Defense Force)

Twenty-First Century Nuclear Deterrence

Operationalizing the 2018 Nuclear Posture Review

By Ryan W. Kort, Carlos R. Bersabe, Dalton H. Clarke, and Derek J. Di Bello

The power to hurt—the sheer unacquisitive, unproductive power to destroy things that somebody treasures, to inflict pain and grief—is a kind of bargaining power, not easy to use but used often.

—THOMAS SCHELLING, *ARMS AND INFLUENCE*

A distinction must be made between lessons learned and fighting yesterday's war. The French experience in World War I led to the construction of the Maginot Line series of fortifications. The French neglected to adapt to changes in the operational environment, and their monolithic method for deterrence, based on established convictions that the next war would be similar in critical aspects to World War I, failed

Major Ryan W. Kort, USA, is Plans Officer at U.S. Strategic Command (USSTRATCOM) J5. Major Carlos R. Bersabe, USAF, is Strategic Operations Officer in the National Airborne Operations Center at USSTRATCOM. Lieutenant Commander Dalton H. Clarke, USN, is the Cross Functional Integration Team Lead at the Joint Information Operations Warfare Center. Major Derek J. Di Bello, USA, is Support Operations Officer at Joint Special Operations Command.

catastrophically during World War II.¹ The United States risks a similar misappraisal of the operational environment in how it understands, plans, and executes nuclear deterrence.

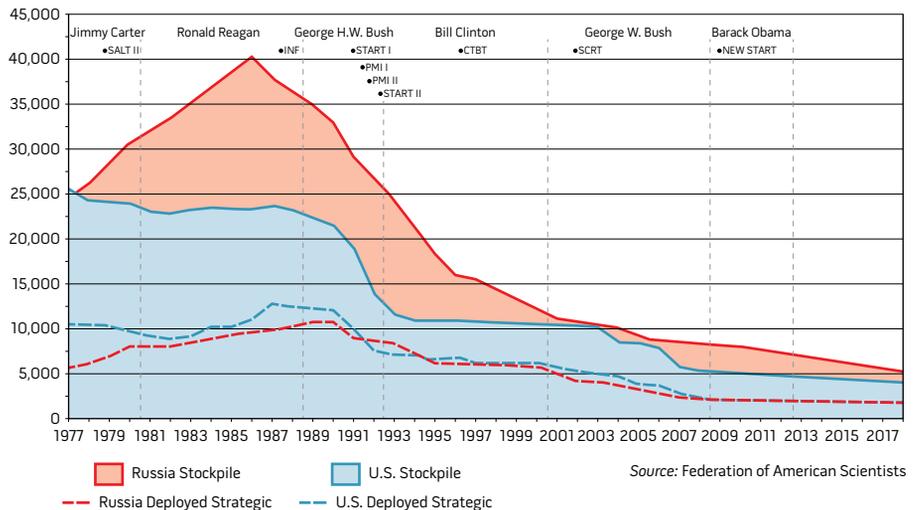
The 2018 Nuclear Posture Review (NPR) clearly lays out the challenge: “This rapid deterioration of the threat environment since the 2010 NPR must now shape our thinking as we formulate policy and strategy, and initiate the sustainment and replacement of U.S. nuclear forces.”² However, an examination of the NPRs since 1994 demonstrates the Nation’s reliance on legacy nuclear deterrence concepts despite changes in the operational environment; that reliance, when juxtaposed against a current understanding of U.S. nuclear threats, exposes a wide “say-do” gap between stated deterrence policy and deterrence in practice. The United States must eliminate its nuclear deterrence say-do gap by operationalizing the 2018 NPR through the development of doctrinal and operational concepts that enable the joint force to acquire and integrate a broad variety of deterrence activities and capabilities, ultimately delivering the tailored and flexible deterrence posture needed to succeed in the 21st century.

Atrophy of U.S. Nuclear Conceptual Thinking: 1994 to Present

The operational environment before the fall of the Soviet Union differed from the one the United States faces today. Whereas the Nation chiefly contended with mutually assured destruction in the former, it now faces multiple actors of concern that present unique threats across the spectrum of conflict—with each one deterred in a different way.³ An analysis of the 1994, 2001, and 2010 NPRs clearly illustrates this transition and contrasts with the 2018 NPR assertions that seek to remedy the decline within U.S. nuclear force doctrines and capabilities.⁴

The post-Cold War’s optimistic caution underpinned the 1994 NPR. The United States accommodated reductions in its nuclear arsenal, accompanied by the so-called peace dividend. Mild successes

Figure 1. Strategic Arms Reduction Treaty: Estimated U.S.-Russian Nuclear Warhead Inventories, 1977–2018



in nonproliferation and disarmament also marked the first half of this decade. Without an aggressive nuclear adversary and with the perception of a more stable nuclear operational environment, the 1994 NPR advocated a “Lead but Hedge” strategy.⁵ In other words, the United States would lead the world in nonproliferation and arms reduction efforts, while also hedging against future uncertainty by retaining what it considered adequate nuclear deterrence capability under the assumption of a more benign security environment compared to the Cold War era. Figure 1 illustrates the Nation’s ambitious focus on arms reduction via the first Strategic Arms Reduction Treaty.

This trajectory remained largely unchanged in the 2001 NPR, despite obvious shifts in the operational environment. As observed by Senate Foreign Relations Committee members regarding the 2001 NPR, potential U.S. adversaries changed, but post-Cold War strategic objectives remained the same.⁶ The continued marginalization of nuclear deterrence led to the formulation of the “New Triad,” which affirmed efforts to reduce nuclear capabilities and aspired to increase conventional capacities.⁷ Additionally, this strategy shifted away from the previous threat-based employment guidance and transitioned to a

capabilities-based approach in defense planning.⁸ The critical shortcoming of adopting the capabilities-based approach was the development of generic capabilities and doctrine, which proved incongruous with the gradual reemergence of peer and near-peer competitors.⁹

The 2010 NPR aimed to further reduce U.S. national security policy reliance on nuclear weapons.¹⁰ Indeed, it trumpeted the fact that the United States and Russia reduced operationally deployed strategic nuclear weapons by approximately 75 percent from Cold War levels.¹¹ While U.S. policy shifted further away from nuclear deterrence—with its attention still fixated on executing two lower intensity conflicts—Russia, China, and North Korea advanced their operational concepts and developed new or enhanced capabilities. While the United States delayed modernizing its nuclear inventory, other global competitors seized the initiative.¹²

U.S. thinking about deterrence stagnated and regressed, evidenced by a lack of joint doctrine on nuclear operations from 2006 to the present.¹³ The United States has attempted to execute deterrence largely the same way since the Cold War, with the presumption that our Cold War-era doctrine and concepts would suffice with the grave exception of devaluing its role. The implicit danger of failing to



Two long-range ground-based interceptors launched from Vandenberg Air Force Base, California, March 25, 2019, in first-ever salvo engagement test of threat-representative intercontinental ballistic missile target successfully intercept target launched from Ronald Reagan Ballistic Missile Defense Test Site on Kwajalein Atoll (Defense Missile Agency/Lisa Simunaci)

rethink doctrinal concepts is the assumption that they will continue to work in the future. Per strategist and theorist Colin Gray, correlation is not causality, and the greatest non-event in history is not necessarily proof that our previous deterrence concepts worked.¹⁴

The Competitive Space

What academic circles have termed the “Second Nuclear Age” largely describes

the nuclear power vacuum created by continued U.S. deemphasis of nuclear operations. Among the numerous actors of concern, Russia, China, and North Korea stole the opportunity and advanced their nuclear operational concepts and capabilities.¹⁵ Since 2010, despite decades of U.S. leadership to reduce the number and role of nuclear weapons on the geopolitical stage, other international actors moved in the oppo-

site direction, presenting an “unprecedented range and mix of threats” that left the United States in an operational nuclear lurch.¹⁶ While the Nation identified the need to recapitalize its strategic nuclear forces, a critical gap exists at the operational level with limited numbers of low-yield nuclear weapons intended for use on the battlefield. Figure 2 illustrates this disparity.

Russia. Russia poses the greatest near-term and existential threat to America.¹⁷ Moscow capitalized on the last 15 years, modernizing nuclear operations and equipment for achieving its aims through a variety of methods, including nuclear coercion. It violated the Intermediate-Range Nuclear Forces Treaty in 2014 by fielding a new road-mobile missile and recently began fielding its most capable missile, the RS-28 Sarmat, which Western analysts call the Satan-2. President Vladimir Putin boasted that Russian advances in nuclear technology were unmatched and unprecedented in world history.¹⁸

The 2018 NPR clearly highlights the challenge posed by Russia: “Most concerning are Russia’s national security policies, strategy, and doctrine [emphasizing] the threat of limited nuclear escalation, and its continuing development and fielding of increasingly diverse and expanding nuclear capabilities.”¹⁹ This concept is called “escalate to deescalate,” whereby Russia would seek to employ a low-yield nuclear attack in such a fashion as to make a proportional U.S./North Atlantic Treaty Organization (NATO) response politically unacceptable or impractical.²⁰ In this sense, the deescalation would be the result of Western “capitulation on terms favorable to Moscow.”²¹

In turn, U.S. and NATO reliance on the air-delivered B61 gravity bomb for in-theater (operational level) nonstrategic nuclear deterrence highlights the dilemma posed by the potential lower nuclear first-use threshold. In order to deter and respond to the potential use of nonstrategic nuclear weapons by Russia, the United States and NATO can only counter with fourth-generation Western fighter aircraft against highly capable

Russian integrated air defense systems.²² In short, Russia clearly understands and exploits this existing gap.²³

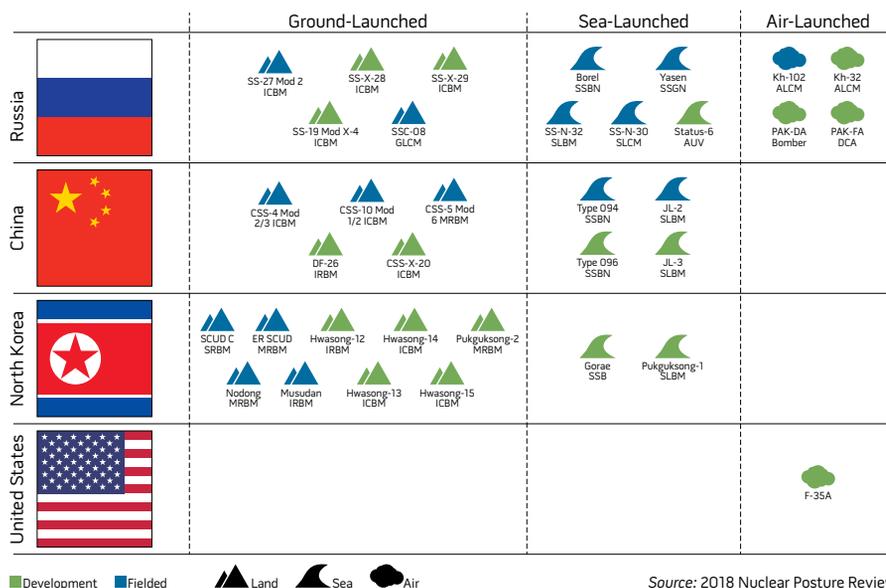
China. Largely shrouded in ambiguity, China’s expanding nuclear deterrence doctrines and capabilities pose a serious strategic challenge for how the United States conducts nuclear deterrence. In 2016, President Xi Jinping elevated China’s Second Artillery Corps, in charge of land-based nuclear forces, to become its own service, the People’s Liberation Army Rocket Force, which consolidated command and control over all nuclear forces. This is problematic for several reasons.

Coupled with its newly streamlined command and control structure, China’s lack of transparency regarding the “scope and scale of its nuclear modernization program raises questions regarding its future intent.”²⁴ In broad terms, “it is developing and testing several new classes and variants of offensive missiles, forming additional missile units, upgrading older missile systems, and developing methods to counter ballistic missile defenses.”²⁵ The quantity of these new weapons systems is also ambiguous, with estimates ranging from a few hundred to a few thousand.²⁶ It raises the question of why a country with a “no first use” policy would seek to place greater emphasis on creating a shorter kill chain with more advanced weaponry.

Uncertainty concerning Chinese nuclear capabilities, doctrine, and concepts also creates further concern when viewed in context with its other geopolitical actions. These include the claims on, creation of, and militarization of man-made islands in the South China Sea, the broader coercion by diplomatic and economic means of its neighbors, and the aggressive intellectual property theft of American/Western military-industrial knowledge.

North Korea. At the June 12, 2018, summit between the United States and North Korea, the heads of state reaffirmed the April 27, 2018, Panmunjom Declaration that committed North Korea to work toward complete denuclearization of the Korean Peninsula. As long as North Korea continues to possess nuclear

Figure 2. Nuclear Delivery Systems Employed or in Development since 2010



weapons in any number, a very real and present danger still persists.²⁷ With its economy largely dependent on its relationship with China, the much more impoverished North Korea views its possession and pursuit of nuclear weapons capabilities as existential to the preservation of the Kim Jong-un regime.²⁸

Assuming that North Korea does not dismantle its nuclear enterprise in the near future, there are inherent difficulties in shaping its behavior. The United States spent the better part of the last two decades attempting to end North Korea’s nuclear weapons program through sanctions, frameworks/agreements, and United Nations Security Council resolutions, which all sought to coax or coerce North Korea into arms reduction in exchange for goods, energy, and food. In each instance, North Korea balked and restarted its programs with limited repercussions. If left unchecked, North Korea will continue to threaten the East Asia region and perhaps one day the United States itself.

In response to North Korean missile testing, Japan and South Korea reportedly considered “the nuclear option, driven by worry that the United States might hesitate to defend the countries if doing so might provoke a missile

launched from the North at Los Angeles or Washington.”²⁹ Former Secretary of State Henry Kissinger echoed this sentiment of potential proliferation: “If they continue to have nuclear weapons, nuclear weapons must spread in the rest of Asia.”

Operationalizing the 2018 NPR

The United States must act quickly if it seeks to regain and maintain a qualitative conceptual edge over its adversaries. A sober appraisal of past nuclear thinking combined with deliberate U.S. neglect of its nuclear forces serve as the catalyst for the 2018 NPR’s admission that “the United States now faces a more diverse and advanced nuclear-threat environment than ever before, with considerable dynamism in potential adversaries’ development and deployment programs for nuclear weapons and delivery systems.”³⁰ As such, the United States must develop tailored and flexible operational concepts to ensure effective deterrence against a range of potential 21st-century actors of concern. Failure to act decisively and formulate the necessary concepts and associated capabilities to operationalize this strategy will create gaps in the U.S. extended deterrence

umbrella, which will leave allies vulnerable to coercion and increase the likelihood of a nuclear exchange. Bold action now will not only mitigate political and military risk but also present the United States with opportunities to engage with actors of concern from a position of strength to reduce the risk of miscalculation and escalation.

Russia. Russia is the only true existential threat to the United States and perceives it has advantages in nuclear posture due to its large, varied nuclear forces and escalate-to-deescalate doctrine. As such, it remains the principal actor of concern over the near- to mid-term. To overcome this challenge, the United States and NATO must incorporate the conceptual use of nuclear weapons into a broader variety and scale of exercises, while developing additional capabilities to offset Russia's numerical advantage in low-yield nuclear weapons.

The United States and NATO must demonstrate the capability to react proportionally to potential Russian first use. The advantage of integrating nuclear weapons planning into a broader variety of exercises will ensure proficiency within the force and equip U.S. and NATO leaders with a better understanding of escalation dynamics. In addition, the expansion of exercises would signal to Russia that NATO maintains the broad resolve required to employ nonstrategic nuclear weapons to protect collective interests. Incorporating dual-capable aircraft as nonstrategic nuclear weapons platforms into traditionally land-centric marquee exercises such as Atlantic Resolve will build readiness and reassure allies.

Additionally, the United States must develop or enhance capabilities that force the Russians to reconsider the validity and acceptability of adopting its "escalate to de-escalate" strategy. New delivery methods for nonstrategic nuclear weapons, such as the submarine-launched cruise missile described in the 2018 NPR, would provide additional dilemmas for Russian military and political leaders contemplating a limited nuclear strike.³¹ The United States should also consider the ability to rapidly deploy ballistic missile defenses and traditional

air defense capabilities to mitigate the Russian numerical advantage in nonstrategic nuclear weapons.

China. The 2018 NPR expresses the Nation's tailored strategy for China in broad terms. In essence, the mere possession of nuclear weapons with multiple options should allow for flexibility and therefore suffices as effective deterrence.³² However, what should be antecedent to, or at the very least concurrent with, this approach seems to be mentioned only in passing.³³ Because of China's deliberate opacity regarding its nuclear weapons programs, a lion's share of effort must be dedicated to penetrating this lack of transparency, which will provide higher fidelity for U.S. options while also mitigating the increasingly intense geopolitical dynamic in East Asia.

Remarking on the 2018 NPR, Chinese government spokesmen derided the idea that its nuclear weapons program should cause any concern for U.S. interests.³⁴ However, this discord may be born from a lack of mutual understanding as speculated in the following:

*As far as China is concerned, what is important is ensuring that it has the technological leeway to avoid being caught off guard by new innovations. Yet U.S. scholars cannot fully comprehend this way of thinking, and China and the United States have almost never engaged in any serious dialogue about it.*³⁵

In any case, the United States must close this gap and stabilize its relationship with China. In lieu of any progress made on the political front, more fully incorporating and advancing U.S. ballistic missile defenses and exploiting new strategic intelligence capabilities may prove to be an effective stopgap measure against China's nuclear weapons modernization.

North Korea. Developing operational concepts to deter North Korea poses unique challenges for the United States and its regional partners. One weakness that can be exploited is North Korea's limited number of nuclear-capable theater and intercontinental ballistic missiles. In this nontraditional view of deterrence,

the United States should seek to employ a sufficient number of ballistic missile defenses in the region not only to reduce the risk from North Korean nuclear attack but also to visibly demonstrate to the Kim regime that the United States has a sufficient number of interceptors to neutralize North Korea's nuclear threat.

Furthermore, the United States should strongly consider a potentially controversial new concept involving custodial sharing of nonstrategic nuclear capabilities during times of crisis with select Asia-Pacific partners, specifically Japan and the Republic of Korea. As with NATO, the United States would maintain ownership of these weapons, ensuring that the stipulations in the Non-Proliferation Treaty signatories remain in effect. Also, the construct will not mirror the NATO model for nonstrategic nuclear employ due to politico-military restrictions. This would have an added deterrent effect on North Korea, but perhaps the greatest advantage would be the increased pressure put on China to constrain North Korea's aggression.

The forward presence of nonstrategic nuclear capabilities in East Asia provides an additional advantage through demonstrating greater assurance to U.S. regional allies. Considering North Korea's history of aggressive nuclear rhetoric and recent missile tests, combined with the deliberate U.S. deemphasis of nuclear deterrence in national policy, this course of action would provide renewed physical evidence of U.S. resolve. It would also provide another avenue for collaboration and strengthening military partnerships through joint-regional exercises, all of which are necessary to deter potential adversaries and reassure allies.

Conclusion

On the surface it may seem that U.S. leadership in nuclear arms control and nonproliferation is altogether positive, but there have been several costly side effects. As each NPR demonstrated, the diminished U.S. nuclear posture also served to marginalize its nuclear forces, resulting in several scandals that could have ended with catastrophic conse-

quences.³⁶ Meanwhile, the operational environment changed drastically, where several actors of concern took advantage of the permissive U.S. attitude as an opportunity to advance their nuclear arsenal, thereby lessening the effectiveness of U.S. nuclear deterrence. As outlined in the 2018 NPR, however, the United States seems to recognize that it is at an inflection point.

Critics of these recommendations may likely take issue with some of the specific proposals advocated herein. A potential criticism involves the perceived moral aversion to development and integration of new nonstrategic nuclear weapons into a broader deterrence framework. Regardless of the perceived morality attached to nuclear weapons, the threat of nonstrategic nuclear weapons must be real and credible to ensure robust deterrence.³⁷ Concerning the potential criticism of including these weapons in exercises, the United States regularly integrated them into large-scale exercises during the Cold War. Only the perception of the benign strategic environment described in previous NPRs induced the United States to cease broader incorporation of nonstrategic nuclear weapons, as well as to stop developing new capabilities that would fill the current gap.³⁸ Finally, a criticism that adopting the assertive posture advocated by the 2018 NPR is destabilizing fails to provide an alternative solution to lower the risk of nuclear exchange during a conflict.

In order to defend its vital interests and reassure its allies, all while hedging against an uncertain future, the United States must maintain a credible nuclear deterrent capability and the ability to convince potential adversaries of its resolve to employ those capabilities when required. The United States must eliminate its nuclear deterrence “say-do” gap by operationalizing the 2018 NPR. As such, the development of operational concepts tailored to these specific threats rather than a generic and irrelevant capabilities-based doctrine will enable the United States to truly operationalize the 2018 NPR. JFQ

Notes

¹ Eliot A. Cohen and John Gooch, *Military Misfortunes* (New York: Free Press, 1990), 213–215.

² *Nuclear Posture Review* (Washington, DC: Office of the Secretary of Defense, February 2018), vi, available at <<https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>>.

³ *Joint Operation Environment 2035: The Joint Force in a Contested and Disordered World* (Washington, DC: The Joint Staff, July 14, 2016), 6.

⁴ *Nuclear Posture Review 2018*, 2–3.

⁵ U.S. Senate Committee on Armed Services, *Briefing on the Results of the Nuclear Posture Review* (Washington, DC: Government Printing Office, September 22, 1994).

⁶ U.S. Senate Committee on Foreign Relations, *Examining the Nuclear Posture Review* (Washington, DC: U.S. Government Printing Office, May 16, 2002).

⁷ Amy Woolf, *The Nuclear Posture Review: Overview and Emerging Issues*, RS21133 (Washington, DC: Congressional Research Service, January 31, 2002), available at <www.fas.org/wp-content/uploads/media/The-Nuclear-Posture-Review-Overview-and-Emerging-Issues.pdf>.

⁸ *Nuclear Posture Review Report Excerpts to Congress* (Washington, DC: Department of Defense, January 8, 2001), 2.

⁹ *Joint Defense Capabilities Study: Improving DOD Planning, Resourcing and Execution to Satisfy Joint Capabilities* (Washington, DC: Department of Defense, January 2004), 1-1-1-2.

¹⁰ *Nuclear Posture Review* (Washington, DC: Department of Defense, 2010), 2.

¹¹ *Ibid.*, 13.

¹² *Nuclear Posture Review 2018*, 7.

¹³ Joint Publication 3-12, *Nuclear Operations*, was rescinded in 2006 and renamed *Cyberspace Operations*. There is no current joint publication for nuclear operations.

¹⁴ Colin S. Gray, *Modern Strategy* (New York: Oxford University Press, 1999), 299.

¹⁵ *Nuclear Posture Review 2018*, v.

¹⁶ *Ibid.*, 2.

¹⁷ Gordon Lubold, “Joint Chiefs Chairman Nominee Says Russia Is Top Military Threat,” *Wall Street Journal*, July 9, 2015, available at <www.wsj.com/articles/joint-chiefs-chairman-nominee-says-russia-is-top-military-threat1436463896>.

¹⁸ “Presidential Address to the Federal Assembly,” Manezh Central Exhibition Hall, March 18, 2018, available at <<http://en.kremlin.ru/events/president/news/56957>>.

¹⁹ *Nuclear Posture Review 2018*, 30.

²⁰ James Quinlivan and Olga Olikier, *Nuclear Deterrence in Europe* (Santa Monica,

CA: RAND, 2011), 36.

²¹ *Nuclear Posture Review 2018*, 30.

²² Thomas McCabe, “The Russian Perception of the NATO Aerospace Threat,” *Air & Space Power Journal* 30, no. 3 (2016), 64–77.

²³ “Presidential Address to the Federal Assembly.”

²⁴ *Nuclear Posture Review 2018*, 11.

²⁵ *Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2016* (Washington, DC: Office of the Secretary of Defense, 2016), 67.

²⁶ U.S.-China Economic and Security Review Commission, *2012 Report to Congress of the U.S. China Economic and Security Review Commission* (Washington, DC: U.S. Government Printing Office, November 2012), 176, available at <www.uscc.gov/Annual_Reports/2012-annual-report-congress>.

²⁷ “Joint Statement of President Donald J. Trump of the United States of America,” Singapore, June 12, 2018, available at <www.whitehouse.gov/briefings-statements/joint-statement-president-donald-j-trump-united-states-america-chairman-kim-jong-un-democratic-peoples-republic-korea-singapore-summit/>.

²⁸ Paul Bracken, *The Second Nuclear Age* (New York: Henry Holt and Company, 2012), 191–192.

²⁹ David E. Sanger, Choe Sang-Hun, and Motoko Rich, “North Korea Rouses Neighbors to Reconsider Nuclear Weapons,” *New York Times*, October 28, 2017.

³⁰ *Nuclear Posture Review 2018*, v.

³¹ *Ibid.*, 55.

³² *Ibid.*, 32.

³³ *Ibid.*

³⁴ Mike Yeo, “China to U.S: Don’t Use Us as an Excuse to Alter your Nuclear Strategy,” *Defense News*, February 21, 2018, available at <www.defensenews.com/smr/nuclear-triad/2018/02/21/china-to-us-dont-use-us-as-an-excuse-to-alter-your-nuclear-strategy/>.

³⁵ Li Bin and Tong Zhao, *Understanding Chinese Nuclear Thinking* (Washington, DC: Carnegie Endowment for International Peace, 2016), 8.

³⁶ Nina Burleigh, “Are We on the Verge of a Nuclear Breakdown?” *Rolling Stone*, June 18, 2015, available at <www.rollingstone.com/politics/politics-news/are-we-on-the-verge-of-a-nuclear-breakdown-52975/>.

³⁷ John T. Cappello, Gwendolyn M. Hall, and Stephen P. Lambert, *Tactical Nuclear Weapons: Debunking the Mythology* (Colorado Springs: USAFA Institute for National Security Studies, August 2002), 24.

³⁸ Eliot A. Cohen, *The Big Stick: The Limits of Soft Power and the Necessity of Military Force* (New York: Basic Books, 2016), 68.

Fire controlman (left) and gunner's mate maintain Mark 38 25mm machine gun aboard USS *Porter* in Atlantic Ocean, March 5, 2019 (U.S. Navy/James R. Turner)



Global Risks and Opportunities

The Great Power Competition Paradigm

By Mark D. Miles and Charles R. Miller

When studying today's emerging great power competition paradigm, it is edifying to recall the most recent historical antecedents: the zenith of Europe's imperial period and the Cold War. From 1815 to 1914, it was rare for competition between the great powers of Europe to manifest militarily (the Crimean War being the notable exception), limited

at least in part by Great Britain's global reach and near-hegemonic power. Instead, Europe's great powers sought other domains of national power and geographic locations outside of the European core in which to compete—for example, the Russian and Austro-Hungarian empires in the Balkans or the British, Belgian, French, and later German empires in Africa. In some

geographies, the competition narrowed to a bipolar contest, as in the "Great Game" between the British and Russian empires in Central Asia. In that contest, information operations, economic diplomacy, and espionage were the primary weapons of statecraft, as was typical for a century when military force was rarely a first resort in inter-state competition and was never employed without accompanying diplomatic and economic levers of power.

Another historical era to which some compare the present great power competition paradigm is the Cold War between

Mark D. Miles is a Strategic Analyst, U.S. Central Command, J5, Strategy, Plans, and Policy Directorate. Brigadier General Charles R. Miller, USA, Ph.D., is Deputy Director of U.S. Central Command, J5, Strategy, Plans, and Policy.

the United States and the Soviet Union. The coldest part of the Cold War was felt in Europe and northeast Asia where the North Atlantic Treaty Organization alliance, along with U.S. security guarantees, shared ideological perspectives, and relatively stable political arenas left little room for direct competition. But elsewhere—in Southeast Asia, Latin America, and Africa—the struggle between the West and the Soviet bloc was anything but “cold,” as the two superpowers, their allies, and proxies competed across all elements of national power to gain sway with emerging or transitioning countries amid the unwinding of colonialist systems. Nowhere was the superpower competition more dynamic or more pivotal to the Cold War’s final outcome than in the Middle East and Central Asia.

Great Power Competition Today

The shift in emphasis in the National Defense Strategy and other guiding documents toward a transregional and inter-state competition conceptual framework reflects the reality of China’s rapid rise to the first rank of economic and military powers, Russia’s reassertion—by word and deed—that it deserves great power status after the perceived humiliations of the 1990s, and an openness to alternative economic and political models within the regions hosting the competition. This openness is both a result of internal trends emboldening national leaders to seek opportunities to protect their interests, and a perception that the United States—and the West in general—is retrenching, introspective, and capricious.

Amid these real and perceived changes, the United States is actively shifting its resources—military and otherwise—toward Europe and East Asia to ensure that we are poised to protect ourselves and our allies from our rivals’ revisionism. However, a look back to the 19th century or the more recent Cold War reveals that, as the frontiers nearest our competitors harden, inter-state competition will displace to those geographies that offer space and provide broader economic opportunities. Following

this model, we should expect that great power competition in the 21st century will encompass not only the Middle East and Central Asia, but also Latin America and Caribbean (LAC) regions and Africa.

The 2018 National Defense Strategy prioritizes competition with China and Russia and seeks to expand the competitive space while strengthening alliances and partnerships.¹ Formulating an effective response to China and Russia’s global activism will be challenging. To accomplish this in terms of great power competition, we must ensure a clear understanding of both powers’ strategic concept for these regions. Next, we must examine the available political, economic, information, and security “space” in which competition could occur and allocate resources against them according to national priorities. Finally, we must work with our strategic allies to promote efficiency of our combined efforts and find areas of mutual interest to build bridges with our rivals, ultimately reinforcing global institutions and avoiding the escalation of tensions into open hostilities.

China. Chinese President Xi Jinping amplified existing trends when he came to power in 2012 and adopted policies to accelerate the growth of China’s comprehensive national power in support of the country’s “great rejuvenation” by 2049 through the assertive use of all instruments of national power, including economic and military.² The Belt and Road Initiative (BRI), which joins a continental economic belt and a maritime road to promote cooperation and interconnectivity from Eurasia to Africa and into Latin America, is the central foreign policy tenet in support of this goal and aims to ensure China’s continued economic growth and connectivity to needed resources and global markets.³ Across Central Asia, China has invested in energy and transit infrastructure under the BRI umbrella to create the China-Pakistan Economic Corridor, which includes the creation of economic zones and investment in Gwadar port and is the “flagship” component of BRI. The Middle East is important to BRI as well, as the region is one of China’s more important sources of crude oil

and has attracted billions in Chinese investment, including the Persian Gulf and Iran. Likewise, China has become a pivotal economic partner for Latin American countries through access to natural resources, foreign markets, and the diversification of Chinese firms, and it is fostering additional ties via a regular China–Latin America forum that includes 33 countries. China has invested billions in the LAC and sub-Saharan African countries, making Africa the second largest source of crude imports for China after the Middle East.⁴

Also associated with the BRI are China’s investments into regional commercial port infrastructure. This includes a joint venture with Egypt to develop the China-Egypt Suez Economic and Trade Cooperation Zone, the Shanghai International Port Group’s development of a commercial port in Khalifa (Abu Dhabi), potential future investment in Omani ports, the port development project turned military base in Djibouti, and economic support to the Panama Canal.⁵ Many observers believe the Chinese People’s Liberation Army Navy (PLAN) support base in Djibouti is a model for China to establish additional support bases and military facilities in its “string of pearls” strategy intended to underpin the security of Chinese economic interests and citizens. The location of China’s first overseas base and the other ports with concerted Chinese investment provides significant advantages that will affect the decision calculus and potentially the access of all actors in the region to key thoroughfares and infrastructure.⁶

As China rises as a global military power, its economic and domestic security interests have begun to require Beijing to adopt a limited security role outside of its traditionally claimed sphere of influence in the South China Sea. The base in Djibouti supports China’s long-standing counterpiracy efforts in the Gulf of Aden.⁷ In Central Asia, China created the Quadrilateral Cooperation and Coordination Mechanism in 2016 as a counterterrorism effort that includes joint patrols of the Afghanistan-China-Tajikistan border region and a military facility with People’s Liberation Army



Sailors man rails aboard guided-missile destroyer USS Zumwalt as ship pulls into Joint Base Pearl Harbor–Hickam, Pearl Harbor, April 2, 2019 (U.S. Navy/ Holly L. Herline)

presence in Tajikistan.⁸ China's comprehensive policy toward the LAC has included important elements of military and security cooperation to include bilateral and multilateral military-to-military engagements and exercises, trainings, forums, and humanitarian missions.⁹ In the private sector, China has leveraged private security companies to protect some of its BRI-related projects in unstable areas and its commercial fleet to support the PLAN for use as an asset to support military operations abroad.¹⁰

China has adopted several key messaging themes in an effort to enhance its influence within the regions. Beijing's narratives are designed to portray China as a nonthreatening, reliable economic partner that can provide countries in the region with the capital, technology, infrastructure, and equipment needed for greater prosperity and stability. Conversely, Chinese narratives cast the United States as a destabilizing and predatory influence.¹¹ Despite promises for

win-win development, China's predatory economic practices, tensions emanating from its preferential use of Chinese materials and labor, and infringements on host nation sovereignty often undermine these narratives and may impede implementation of key Chinese projects.

Ultimately, the lack of an overt political or ideological agenda, the availability of capital, and Beijing's willingness to invest in riskier projects with fewer restrictions make China particularly attractive to regional governments. Beijing largely employs a noninterference policy diplomatically and is nonconfrontational in international forums on topics regarding the Middle East.

Russia. The election of Vladimir Putin in 2012 and his return to the Russian presidency marked the beginning of a significant expansion in Russia's global reach. To enable this expansion, Moscow has relied on a wide array of diplomatic, intelligence, military, and economic tools to include cyber, trade,

energy, and finances to influence decisionmakers, political systems, and public attitudes in the Middle East, Central Asia, Latin America, and Africa. The Middle East reemerged as a priority for Russia in 2012 due to the region's economic potential to prop up Russia's lagging economy, domestic security concerns (especially terrorism) related to the region's geographical proximity, and the Kremlin's political objectives to create leverage to affect Western behavior, change the international order to avoid isolation, and shape domestic public opinion.¹² Russia's military intervention in Syria in September 2015 and subsequent perceived successes in this theater have motivated a more proactive and assertive Russian approach to the Middle East, exemplified by the Kremlin's attempts to affect the domestic political dynamics of the region as in Syria and Libya, defense of Iran in international forums, and offers to mediate talks for various regional conflicts and tensions. Thus far,

the Kremlin has reestablished itself as a regional power broker and cultivated relations with regional rivals with minimal backlash. As Moscow takes on a greater role in the region's internal dynamics, it is unclear if Russia will be able to maintain this diversity or support all of its efforts unilaterally.

Economically, the Middle East and Central Asia regions are critical for Moscow's interests due to the importance of hydrocarbons to the Russian economy and opportunities to circumvent or ease the impact of Western sanctions.¹³ Russia is building relations with its potential rivals in the energy sphere, particularly Iran and Saudi Arabia, and is competing for influence over resources that are also critically important to China in the Middle East, Central Asia, Africa, and Latin America.¹⁴ These economically important regions in the Middle East and North Africa are also essential to Russia's security calculus. The extended lease of Tartus Naval Base in Syria and investment in the Suez Canal area provide Russia with access to critical lanes of maritime communication leading to the Atlantic and Indian oceans and a platform to project naval power and monitor the flow of Middle Eastern oil and gas to Europe and the Far East. From this position, Russia can restrict Western flexibility in the region.

Russia's intervention in Syria and posturing with respect to Afghanistan highlight another security concern motivating its reemergence as a player: the threat to Russia and its claimed sphere of influence by the presence and participation of Russian-speaking and former Soviet state citizens in violent extremist organizations in these regions. Prior to Syria and the rise of the so-called Islamic state, jihadists from former Soviet states were more scattered, had more narrow objectives, and did not have the size and diversity currently represented. Syria provided the ground for networking among these entities and enhanced ties with international terrorist organizations.¹⁵ Moscow's concern for this threat is long term, although it is an area where Russia seems to be reluctant to directly intervene at this time. Instead, Russia is capitalizing

on the counterterrorism activities of the United States and its allies, while focusing its resources to achieve short-term goals to include securing a Moscow-friendly regime in Syria and reinforcing its hard power in Central Asia.

Politically, since 2015, Russian actions in the Middle East have demonstrated to regional regimes that Russia is a reliable, decisive partner devoid of the West's ideological restrictions and a diplomatic and military force to be reckoned with. This is especially true for Iran. Russia positioned itself as a key mediator in the Iranian nuclear issue and as a viable alternative to the West's perceived capriciousness with the Kremlin's backing of Iran through the reimposition of U.S. sanctions. The Kremlin responded quickly to partner requests for military equipment in the face of internal unrest and used its position in international forums to defend its partners. While Moscow has not sought to directly compete with the United States economically or politically in the region, the Kremlin is poised to capitalize on geopolitical space created by either U.S. policies or changes within the domestic spheres of partner countries. In this way, Putin casts doubt on the existing international order and casts himself as the defender of sovereignty and "traditional" values.

Although Russia has largely not sought to directly challenge the United States, Moscow uses the information space to reinforce regional narratives, cast Russia as a responsible actor, question the reliability of the West, and promote falsities that undermine the United States, such as emphasizing U.S. responsibility for regional instability and supporting terrorist organizations. Russia's information operations in the Middle East and Latin America utilize the state media RT, Sputnik Arabic, and Sputnik Mundo services, which maintain an online presence, utilize social media as a force multiplier and engagement mechanism, and encourage local authors with the requisite language and cultural familiarity to appeal to a wide audience.¹⁶ The Kremlin's narratives are generally most effective in uncontrolled media environments and among populations favorable to Russia,

to a Russian ally, or to groups in search of alternative explanations. In the Middle East, the largely state-controlled media restrict the effectiveness of Russian information operations, and the Kremlin's narratives are best received in populations with preexisting positive sentiment toward Russia, including Syria, Egypt, and Iraq. In Latin America, RT and Sputnik Mundo programming is readily available and often cited as main sources by official media. Moscow's propaganda outlets work to stoke anti-U.S. sentiment and support populist figures in Latin American elections.¹⁷

What's Next for Great Power Competition in the Regions?

The expanding need driven by the global reach of China's diplomatic, information, military, and economic initiatives, as well as Russia's objective to weaken or subvert Western security structures in the Middle East, Central Asia, Latin America, and Africa will challenge U.S. prosperity, security, and critical relationships in the respective regions. Deterring or defeating great power aggression is a fundamentally different challenge than the regional conflicts that have plagued these areas and formed the basis of U.S. planning constructs over the past quarter-century.

In an era of constrained resources and in the context of an evolving global dynamism, the United States is facing a multitude of questions, not least of which are: How do China and Russia's actions affect U.S. interests and foreign policy goals? What are the costs and benefits to the United States, and what role does it want to play? What roles in great power competition for Russia and China are acceptable to the United States? Finally, how can the United States compete against Russia and China in these key regions, and what are we willing to sacrifice, especially when the demands of buttressing our positions in Europe and East Asia compel a reallocation of forces away from some great competition areas?

While not exhaustive, some combination of the following lines of effort may help posture the United States to counter adverse Chinese and Russian activity and



Army AH-64 Apache attack helicopter assigned to 2-6 Cavalry Regiment, 25th Combat Aviation Brigade, sits on flightline under night sky on FARP 17, Pōhakuloa Training Area, Island of Hawaii, Hawaii, April 13, 2019 (U.S. Army/Keith Kraker)

present opportunities to U.S. security interests and alliances relative to great power competition.

Reassure Partners of our Commitment. Through our continued military presence, even amid a reallocation of resources that reduces our footprint, we demonstrate to our allies and partners our commitment to regional security and stability. Task-specific combined joint task forces, continual senior defense official–defense attaché engagement, international military education and training exchanges, and coordinated high-level visits all contribute to military presence. Continued long-standing military exercises signal our commitment and increase our readiness and capacity to cooperate with partners. In demonstrating our commitment, we must also be honest and forthright about our limitations and priorities within these relationships and understand that security, economic, diplomatic, and information space unclaimed

by the West is a potential opportunity for a competitor. Simultaneously, U.S. and host nation resources are not infinite, and competitor engagement in some sectors may be beneficial to U.S. goals.

Encourage Regional Integration and Military Interoperability. We should continue our diplomatic efforts to buttress existing regional coordination mechanisms, such as the Gulf Cooperation Council, and to advance deeper formal military and economic regional coordination, as with the Middle East Strategic Alliance, especially in light of China’s whole-of-government approach. Regional integration will help our partners resist hostile powers’ efforts to subvert their sovereignty.

Reinforce Regional Understanding of the Dangers of Chinese or Russian Practices. We must engage both diplomatic and informational means to spotlight the dangers of Chinese and Russian practices to partner governments

and publics. To that end, there are multiple instances of the Chinese debt trap and data theft, and the loss of sovereignty and freedom they bring. Likewise, we should increase awareness of how Russia uses disinformation to sow political discord and instability and should inoculate the public and governments against this threat. We should also ensure that Chinese and Russian human rights violations as well as repressive domestic policies toward Muslim populations (such as Chechens and Uighurs) are well understood by regional governments and publics.

Expose Areas Where Chinese and Russian Interests Diverge. Chinese and Russian goals for the region are largely aligned only in the short term and, in some areas (such as arms sales), they are already competing. We should remain alert to examples of divergence between Beijing and Moscow and seek opportunities to capitalize on these using diplomatic or informational levers. In

areas where U.S. interests converge with those of China or Russia, but not both, we should strive to cooperate within existing U.S. law and international institutions, promoting the mechanism and the bilateral relationship.

Seek Areas of Mutual Interest or Deconfliction with China and Russia.

Despite an overarching goal of deterring expanded Chinese or Russian influence damaging to U.S. interests, we must seek opportunities to capitalize on areas of mutual interest where we can and deconflict where we must. We share a goal with China and Russia to ensure the free flow of commerce and to deter piracy, so the potential remains for supporting efforts in these areas. With both countries, we also share a goal of defeating terrorism, although we must tread carefully given different views of both the targets and means for counterterrorism efforts. In Afghanistan, one could imagine China and/or Russia playing a positive role in the medium to long term.

The great power competition paradigm outlined in the National Defense Strategy provides a way to think strategically about inter-state competition in a multipolar world. Both history and a survey of current events demonstrate that the Middle East, Central Asia, Latin America, and Africa will be pivotal spaces for great power competition between the United States, China, and Russia. Military power will reassure our partners and allies, and military cooperation can catalyze greater regional integration. In a contest where diplomatic, informational, and economic power will be the decisive means, we must ensure our military power is fully postured to support our whole-of-government efforts. JFQ

Notes

¹ *National Defense Strategy* (Washington, DC: Department of Defense, 2018).
² Aaron L. Friedberg, “Competing with China,” *Survival: Global Politics and Strategy* 60, no. 3 (June 2018), 7–64.
³ Paul Stronski and Nicole Ng, *Cooperation and Competition: Russia and China in Central Asia, the Russian Far East, and the*

Arctic (Washington, DC: Carnegie Endowment for International Peace, 2018); Eleanor Albert, “China in Africa,” Council on Foreign Relations Backgrounder, July 12, 2017, available at <www.cfr.org/backgrounder/china-africa>; and Niall Walsh, “China’s Strategic Influence Is Growing in the Americas,” *Global Risk Insights*, April 2018, available at <globalriskinsights.com/2018/04/chinas-strategic-influence-growing-americas/>.

⁴ Albert, “China in Africa”; and Walsh, “China’s Strategic Influence Is Growing in the Americas.”

⁵ Alice Vanni, “China’s Global Ambitions and the MENA Region: A Focus on the Energy Sector,” *Instituto Affari Internazionali* 18, no. 54 (September 2018), 1–5; Jeffrey Becker and Erica Downs, *China’s Presence in the Middle East and Western Indian Ocean: Beyond Belt and Road* (Arlington, VA: CNA Analysis and Solutions, 2018); and Ted Piccone, *The Geopolitics of China’s Rise in Latin America* (Washington, DC: The Brookings Institution, 2016).

⁶ Becker and Downs, *China’s Presence in the Middle East and Western Indian Ocean*.

⁷ Jerome Henry, “China’s Military Deployments in the Gulf of Aden: Anti-piracy and Beyond,” *Asie. Visions*, no. 89 (November 2016).

⁸ Stronski and Ng, *Cooperation and Competition*.

⁹ Piccone, *The Geopolitics of China’s Rise in Latin America*.

¹⁰ Alessandro Arduino, “China’s Belt and Road Initiative Security Needs: The Evolution of Chinese Private Security Companies,” *Rajaratnam School of International Studies Working Paper* no. 306, August 2017; and Becker and Downs, *China’s Presence in the Middle East and Western Indian Ocean*.

¹¹ Becker and Downs, *China’s Presence in the Middle East and Western Indian Ocean*.

¹² Nikolay Kozhanov, *Russian Policy Across the Middle East: Motivations and Methods* (London: Chatham House, February 2018); and Andrew Radin and Clint Reach, *Russian Views of the International Order* (Washington, DC: RAND Corporation, May 2018).

¹³ Kozhanov, *Russian Policy Across the Middle East*.

¹⁴ Paul Stronski and Richard Sokolsky, *The Return of Global Russia: An Analytical Framework* (Washington, DC: Carnegie Endowment for International Peace, 2017).

¹⁵ Kozhanov, *Russian Policy Across the Middle East*.

¹⁶ Donald N. Jensen, “Russia in the Middle East: A New Front in the Information War?” *Jamestown Foundation*, December 2017; and Jamie Gurganus, *Russia: Playing a Geopolitical Game in Latin America* (Washington, DC: Carnegie Endowment for International Peace, 2018).

¹⁷ Gurganus, *Russia: Playing a Geopolitical Game in Latin America*.



From NDU Press

Women on the Frontlines of Peace and Security

Foreword by Hillary Rodham Clinton and Leon Panetta
 NDU Press, 2015 • 218 pp.

This book reflects President Barack Obama’s commitment to advancing women’s participation in preventing conflict and keeping peace. It is inspired by the countless women and girls on the frontlines who make a difference every day in their communities and societies by creating opportunities and building peace.

When women are involved in peace negotiations, they raise important issues that might be otherwise overlooked. When women are educated and enabled to participate in every aspect of their societies—from growing the economy to strengthening the security sector—communities are more stable and less prone to conflict.

The goal of this book is to bring together these diverse voices. As leaders in every region of the world recognize, no country can reach its full potential without the participation of all its citizens.

Available at ndupress.ndu.edu/Books/WomenontheFrontlinesofPeaceandSecurity.aspx





Civil War veterans of 57th Massachusetts Infantry Regiment pose with Confederate General William Mahone on May 3, 1887, at crater caused by Union Soldiers exploding mine at Petersburg, Virginia (Library of Congress/William H. Tipton)

Flanking the Crater

By John K. DiEugenio and Aubry J. Eaton

The 2018 National Defense Strategy envisions a rapidly innovating joint force as fundamental to military dominance in the 21st century. In pursuit of this transformation, the strategy charges Service leadership to partner with private industry and academia to incorporate entrepreneurial management techniques into military organizations. This collaboration has

identified the Defense Department's need to provide operators with a platform to share their ideas directly with decisionmakers. In response, commanders have founded venues to hear directly from the tactical edge and established processes to personally sponsor promising ideas. However, emulating a "startup" mentality has unintentionally introduced the misper-

ception that middle management's resistance to change is the primary impediment to innovation. Commanders who bypass middle echelons to fast-track creative ideas risk alienating important sources of domain expertise. This article turns to history to demonstrate that, far from being the greatest roadblock, empowered mid-level leaders are critical to translating innovation success into military victory.

The Battle of the Crater in the U.S. Civil War stands out as an example of innovation success. The impetus for the battle arose out of an idea from the field to alter the battlespace by tunneling

First Lieutenant John K. DiEugenio, USAF, is assigned to the 27th Intelligence Squadron at Langley Air Force Base (AFB), Virginia, as the Chief of Training. First Lieutenant Aubry J. Eaton, USAF, is assigned to the 480th Intelligence, Surveillance, and Reconnaissance Wing at Langley AFB as the Officer in Command, Innovation Project Development and Integration.

under the enemy's fortifications. Echoing the contemporary innovation process, the local commander quickly evaluated the idea's feasibility and leveraged his Soldiers' unique skillsets as civilian miners. A senior leader sponsored the idea, providing time, space, and resources to the innovators. Despite this momentum, the military staff system's perceived inability to recognize the potential of the project frustrated innovators and threatened the project's success.

These frustrations are familiar to modern innovators who express the need to bypass an organization's *frozen middle*, a phrase popularized in business theory to describe the apparent resistance of a company's middle management to implementing senior executives' initiatives.¹ Early research concluded that this echelon rejects change out of self-interest or ignorance, perpetuating misuse of this term.² However, contemporary management scholarship squarely addresses mid-level leadership's indispensable role in ensuring the success of strategic transformation.³ Missing from the literature is a demonstration that isolating these members risks military defeat.

The Union Army's experience in the Battle of the Crater illuminates the critical role of middle echelons in planning, communicating, and ultimately executing creative ideas. Commanders must first reject the term *frozen middle*. On the contrary, a far more accurate description of mid-level leaders is the *neglected middle*—individuals in an organization responsible for understanding, executing, and integrating an innovation into operations. This simple shift in language reflects a larger paradigm shift that empowers, rather than isolates, mid-level Servicemembers. The neglected middle's value is best realized when a commander includes its members early in the development of an innovation. Connecting these leaders with idea generators and sponsors allows the Armed Forces to fully realize the potential of military innovation. Achieving the 2018 National Defense Strategy's vision requires the creation of a Joint Innovation Framework and appointment of a lead integrator to the commander's staff.⁴

The Battle of the Crater

The need to integrate ideas from the tactical edge to increase lethality is not unique to the present day. Ulysses S. Grant, the commanding general of all Union Armies, felt a similar pain in June 1864. Grant understood the timeless imperative to translate innovation success into military victory. Entering the Civil War's fourth year, staggering battlefield casualties placed tremendous political pressure on President Abraham Lincoln to end the conflict with a negotiated settlement.⁵ The Northern press billed the impending election as a referendum on the war, and without tangible battlefield results the fates of both Lincoln and the Union Army remained uncertain.⁶ Five armies in the field operated in concert against Confederate forces near Atlanta, Mobile, the Shenandoah Valley, and Richmond. Lincoln and Grant understood that the Confederate Army of Northern Virginia, commanded by General Robert E. Lee, must be destroyed to end the war.⁷

Throughout the brutal Overland Campaign in the spring of 1864, Grant aggressively pursued battle with Lee. However, technical advances in field fortifications and the rifled musket's increased effective range amplified the tactical defense's advantage.⁸ At the Battle of Cold Harbor, Grant sustained 7,000 casualties in a single assault on Confederate earthworks.⁹ Facing mounting public criticism that labeled him as "Grant the Butcher," he executed a bold movement to outfox his opponent and fight a battle in the open field on his own terms.¹⁰

The Union advance targeted Petersburg due to its importance as a supply hub. Despite the Union Army of the Potomac's numerical superiority, the Confederate's desperate defense prevented Petersburg's fall. Consequently, the opposing forces constructed miles of trenches, resulting in a stalemate. Entrenched regiments suffered from daily bombardments, intense sniper fire, oppressive Virginia heat, and limited rations.¹¹ Frustrated across all levels of war, Grant faced immense strategic pressure to regain the initiative. Rather than launching a costly frontal assault as at Cold

Harbor, he empowered Soldiers in the Union Army to offer innovative solutions to break the siege.

At the nearest point between the opposing forces, an enlisted Soldier from the 48th Pennsylvania Infantry, whose name is lost to history, remarked, "We could blow that damned fort out of existence if we could run a mine shaft under it!"¹² Lieutenant Colonel Henry Pleasants, the regimental commander, overheard the statement and immediately understood the idea's power. Pleasants, a former mining engineer, commanded a regiment partially composed of prior coal miners from Schuylkill County, Pennsylvania.¹³ Pleasants gathered his staff officers and enlisted men to work through the mechanics of the mineshaft's construction.¹⁴ The regimental staff estimated they would need to dig a 500-foot tunnel to reach the Confederate lines. While mining enemy fortifications at short distance was common practice, the Union tunnel's length was well beyond all others attempted in military history.¹⁵ The proposed distance raised concerns about structural support and ventilation in the tunnel. Pleasants, however, was confident in the skills of his troops and pressed forward with the idea.¹⁶

Within hours, Pleasants honed the enlisted Soldier's idea into a feasible proposal to submit to his chain of command. General Ambrose E. Burnside, Pleasants' Corps commander, embraced the proposal and enthusiastically became the idea's senior sponsor.¹⁷ Burnside authorized Pleasants' regiment to dedicate time and space to the project.¹⁸ In addition, Burnside earned Grant's approval to allocate resources for the mine's construction, arguing that the mine's explosion, coupled with a follow-on attack, would yield a "more than even chance of success."¹⁹

Fresh from receiving senior sponsorship, Pleasants set his men to work solving problems at the tactical level. Pleasants appointed Sergeant Henry Reese as the mine boss to organize shift work for the project.²⁰ Demonstrating ingenuity, Pleasants ordered his regiment to modify their standard-issue entrenching tools to act as mining picks in the tight confines of the tunnel.²¹ To discretely



Major General Ambrose Burnside, 1st Rhode Island Infantry Regiment and General Staff U.S. Volunteers Infantry Regiment, in uniform, 1863 (Library of Congress/Mathew Brady)

remove dirt, the regiment modified their hard tack boxes with iron from pork barrels to carry away the spoil to a location out of view of Confederate pickets, thus preserving operational security.²² In addition, instead of waiting for the bureaucracy to provide timber, Pleasants' men dismantled an old bridge and earned Burnside's authorization to operate an abandoned sawmill in the Army's rear.²³ With the necessary materials to ensure the mine's stability, Pleasants next devised

an ingenious tunnel ventilation method utilizing the chimney effect to supply the miners with fresh air.²⁴ Although the Soldiers of the 48th Pennsylvania were organized, trained, and equipped to execute this innovation project at the regimental level, they required Corps support to ensure the mine's completion.

Support to Pleasants' regiment demonstrated the power of an energetic sponsor. In addition to championing the idea at headquarters, Burnside

provided direct assistance at the tactical level. He used his personal connections in Washington, DC, to obtain surveying instruments for Pleasants that were required to measure the distance to the Confederate positions accurately.²⁵ Allowing Pleasants to use the chimney effect to ventilate the mine, Burnside subsequently ordered campfires lit all along his Corps' front lines to prevent drawing Confederate attention to the mine's location.²⁶ Burnside's engagement with senior leaders and political colleagues ensured Pleasants' men had access to resources that would otherwise have been unattainable. Nevertheless, despite the momentum behind the mine's construction, Burnside unintentionally neglected the majority of his Corps.

Organizational seams emerged between the 48th Pennsylvania and Union Army engineers. For instance, the chief engineer of the Army of the Potomac was the author of the authoritative manual on military mining and countermining. Pleasants shut the engineer out from construction and did not consult his manual.²⁷ When word of the project spread among the Union Army's engineers, many were openly cynical. At first, the chief engineer of the Army of the Potomac, General John G. Barnard, praised the project as "exceptionable, so unprecedented."²⁸ He sent a list of questions to Pleasants concerning the likely impact of the mine.²⁹ Pleasants mistakenly perceived Barnard's interest as openly hostile. When the two met, Pleasants defended his tunnel design while stating that West Point cadets like Barnard forgot their surveying skills soon after graduation.³⁰ When Barnard requested recommendations on additional locations to mine, Pleasants curtly ended the interview stating, "I'll see you in hell first!"³¹ This meeting set the tone for the interactions between the innovators and the integrators in the Army of the Potomac. Burnside, unaware or unconcerned, did not offer to mediate the contentious relationship.

Another source of personal friction arose when Burnside removed Pleasants' regiment from their positions to focus on mining and filled the vacant

trenches with war-weary troops. The 48th Pennsylvania, proud of their charge to dig the longest mineshaft in military history, reaped benefits from their senior sponsorship.³² Burnside twice visited the mine with state governors, giving Pleasants' men an opportunity to showcase their historic efforts.³³ In addition, Burnside promised to reward Pleasants' men for their grueling labor with whiskey rations, drawn at the expense of other regiments.³⁴ Consequently, neighboring units chafed at Burnside's treatment of the 48th Pennsylvania. For more than a month, the bulk of Ninth Corps endured the squalor of trench warfare while they observed the 48th Pennsylvania operating from the relative safety of the mineshaft where the miners enjoyed the Corps' whiskey rations.

Further increasing the divide between the 48th Pennsylvania and the rest of the Corps, Burnside devised an attack plan with significant contributions from just one of his four division commanders.³⁵ Burnside excluded the three divisions because he feared their troops were exhausted from trench warfare and were likely to "take cover immediately once they were exposed to heavy fire."³⁶ His decision to exclude three quarters of his Corps from planning and training for the impending assault allowed few troops to understand the mine's purpose. In this atmosphere of uncertainty, cynical attitudes about the mine's potential spread across the Union lines. Seasoned engineers dismissed the mine as "claptrap and nonsense," while other brigade commanders concluded the "mine causes a good deal of talk and is generally laughed at."³⁷ Thus, Burnside inadvertently created a schism between the innovators digging the mine and the Soldiers charged with attacking the Confederate positions following the mine's explosion. Burnside further exacerbated the divide through the expectation that "the men who dug the shaft would not have to join the charge after the mine blew."³⁸ Simultaneously, Burnside estranged the divisional, brigade, and regimental commanders responsible for executing the attack orders they had little input crafting.

Despite rifts between innovators and operators, it is incumbent not only on senior leaders but also on commanders within the neglected middle to bridge gaps in innovation integration. Neglected middle leaders must voice their concerns to senior commanders early in the innovation integration process, while remaining open to new ideas. In the Union Army, Burnside's division commanders, despite their knowledge of the mine's progress, neither raised concerns to Burnside directly nor advocated for inclusion in devising attack plans to exploit the mine's demolition.³⁹ Senior commanders can manage the division between operators and innovators through the creation of innovation demonstrations, neglected middle representation during assault preparation, and a well-established feedback loop.

Neglected middle representation during the formulation of innovative operational concepts is essential to bridge the innovator-operator gap. If the neglected middle has a degree of input in the process, they are more likely to share ownership of the project's planning, as well as its ultimate outcome. At Petersburg, while Pleasants regularly represented innovators' concerns in Burnside's headquarters, there was no cohesive voice to represent the neglected middle. In the weeks before the battle, several regimental commanders—unaware of Burnside's plans—identified potential pitfalls for any operation in their sector. Divisional commanders, absent from planning at Corps Headquarters, were not able to articulate these concerns to Burnside. For example, a dense line of trees troubled commanders of an artillery battery assembled for Burnside's attack as the trees prevented their pieces from attaining a clear field of fire on the opposing Confederate batteries. Burnside dismissed their concerns and did not make sufficient provisions to clear the woods prior to the assault.⁴⁰ In addition to the artillery miscues, regimental commanders identified their own earthworks, consisting of 6-foot-deep trenches, sandbags, abatis, and *chevaux-de-frise* as major obstacles to any offensive maneuver.⁴¹ The Union Army failed to remove

these obstacles before the battle, thereby obstructing units' ability to maneuver cohesively and in mass.⁴² Thus, the tactical concerns of the neglected middle fell on deaf ears and jeopardized Burnside's grand assault. Without neglected middle representation at Burnside's headquarters, the innovators' considerations outweighed the operators' tactical concerns.

Neglected middle representation among senior decisionmakers also prevents friction from derailing innovation integration. To consistently respond with ingenuity to changing battlefield conditions, the neglected middle must share an understanding of the desired outcomes when integrating an innovation. Frequent communication of commander's intent provides subordinates with freedom of action to pursue opportunities and overcome obstacles. In today's military it is imperative that senior leaders expose the neglected middle to innovations before the tools become operational. At Petersburg, Burnside ordered just one of his four divisions, a fresh unit consisting of U.S. Colored Troops (USCT), to rehearse complex maneuvers for the mine attack.⁴³ Hours prior to the offensive, however, the commander of the Union Army of the Potomac, Major General George G. Meade, refused to authorize Burnside's use of the trained division of USCT to lead the attack. While Meade approved the mine's construction, he doubted the innovation's promised effects on the battlespace.⁴⁴ Subsequently, Meade feared the political repercussions from the possible Confederate slaughter of a USCT division.⁴⁵ Meade's order forced Burnside to insert an ill-prepared and battle-weary division to lead the assault. Burnside, reeling from Meade's directive, poorly articulated to his division commanders their orders for the follow-up attack.⁴⁶ Regimental officers pointedly complained, "little information filtered down the ranks as to the details of the plan, and most men knew little of what to expect."⁴⁷ In addition to this critical miscommunication, Burnside abdicated the selection of a replacement division to chance, asking his division commanders to draw lots for the assignment.⁴⁸ Those

in the neglected middle in Burnside's Corps were not only ignorant of the impending mine explosion, but also of their role in exploiting the tactical surprise for strategic value.

An innovation's success does not guarantee battlefield advantage. On the contrary, a successful innovation may increase the risk to operators with little conception of the tool's intended use. In the early morning hours of July 30, 1864, Pleasants' regiment successfully exploded the mine, blowing a mushroom cloud of dirt, debris, and approximately 300 Confederate Soldiers hundreds of feet into the air.⁴⁹ The mine's explosion left a crater where the Confederate trench lines once stood and sent stupefied Confederates scrambling for the rear, leaving their positions undefended.⁵⁰ As a result of miscommunication, however, Union engineers failed to provide axemen to clear Confederate obstacles or to level Union trenches prior to the attack. Follow-on Union waves began to clog the only covered ways, preventing rapid movement and impeding communications to Corps Headquarters.⁵¹ Burnside's neglected middle was thus unprepared to advance in the immediate aftermath of the mine's explosion.

After a delay, the first Union troops reached the crest of the crater untested and stared in awe at the sight. Rather than flanking the crater, as Burnside instructed, they began to pour into it.⁵² During this critical period, troops did not advance toward the ridge behind the Crater, which was in the rear of the entire Confederate line. The divisional commander, Brigadier General James Ledlie, remained behind the lines, where his staff observed him drinking rather than rallying his division.⁵³ Each neglected middle commander had a different conception of where the attack needed to go next. Many individual Soldiers simply assumed that their assignment was to hold the breach, rather than to capture the ridge. Lacking knowledge of the strategic goal of the innovation, the opportunity to march into Petersburg unopposed had escaped the Union's grasp. As these shortfalls compounded, Union forces experienced

effective fire from all directions. After the initial shock from the blast, General Lee rushed troops to the battle, and Confederate Brigadier General William Mahone organized forces for a counterattack. The advancing Confederates found Burnside's troops chaotically trapped in the crater and engaged "as if shooting fish in a barrel."⁵⁴ At a cost of 3,798 casualties (504 killed, 1,881 wounded, 1,413 missing or captured), the Union retreated from the crater. Grant described the battle as "the saddest affair I have witnessed in the war."⁵⁵

Conclusion and Recommendations

The Union Army's innovators demonstrated great competence and bravery in accomplishing their task. Their ingenuity created, in Grant's words, such an opportunity as "I have never seen and do not expect to have again" for the Army of the Potomac to defeat the Army of Northern Virginia.⁵⁶ To achieve victory, the Union Army needed to capitalize on its tactical surprise and rapidly flank the explosion's crater, occupying the heights beyond the Confederate positions. The Union Army did not meet these ends due to degraded mobility, ineffective fires, and inefficient mission command. Burnside failed to articulate a clear vision of how the innovation would affect the battlespace, sowing confusion among the attacking troops. There were many causes for the disaster at the crater, including poor command decisions at the Army, Corps, and Division levels. These command failures were compounded in the extreme because the isolation of mid-level leaders resulted in inadequate planning, miscommunication up and down the chain of command, and abysmal execution. Ultimately, Union forces were unable to concentrate decisive combat power to exploit the opportunity their innovators created.

The Union Army's defeat at the Battle of the Crater illustrates that successful innovations can lead to disaster if they are not effectively integrated into operations. While literature and operators conclude the biggest barrier to

innovation is the reluctance of mid-level leaders to adopt new ideas, this event in military history indicates the opposite is true. The neglected middle is integral to translating innovation success into military victory. A commander's end-state should not circumvent mid-level management, but rather incorporate the neglected middle as part of the team.

Change starts small. Reference to mid-level leaders as the frozen middle exacerbates personal friction. The term *neglected middle* is inherently temporary and consistently relative. Commanders should not accept that a Servicemember is resistant to change until they have made a sincere personal effort to understand their concerns. This shift in language encourages leaders to view integration functions such as finance or security as key members of the innovation team, rather than barriers or roadblocks. Commanders must also ensure they are creating a climate in which their mid-level leaders are open to new ideas. In 1864, the innovators, for various reasons, became alienated from the neglected middle, and from one another. Today, commanders can establish policies and processes to allow the military to deliberately include the neglected middle.

In order to integrate at the speed of relevance, mid-level leaders must be involved as soon as commanders identify an innovation as critical for the organization. Early inclusion allows members across the organization to understand why senior leaders are pursuing an innovation and how it will benefit their team. In 1864, early involvement of the neglected middle may have elevated the concerns of fires and mobility experts, thus increasing the lethality and organization of the Union Army's initial assault. Leveraging the neglected middle allows for the organization to achieve synchronized operations that fully exploit the opportunities an innovation provides.

Unlike their predecessors in the Civil War, modern commanders benefit from an established staff system, the joint planning process, and standard order formats.⁵⁷ However, the Armed Forces lack a joint framework, foundational methodology, and defined relationships

to address the unique challenges of innovation integration. A dedicated staff component would clarify liaison relationships and provide guidance to innovators and integrators alike. Professionalizing this function would introduce a common language and measures of performance for commanders to hold their innovation teams accountable for providing results on the battlefield. Staff members trained in entrepreneurial management techniques help the commander identify functions that require early representation on an innovation project. Integration as a staff function allows leaders to exercise mission command for innovations, providing intent while allowing subordinates flexibility in tactical execution.

Reflecting on the Union Army's failure at the Battle of the Crater, a Soldier aptly observed that the innovation was a "perfect success except that it did not succeed."⁵⁸ When commanders reward and resource experimentation but exclude middle leaders, the Armed Forces risk defeat. Rather, an organization must value mid-level leadership as critical to achieving results on the battlefield. To become a rapidly adapting joint force, the Department of Defense must establish a reliable framework for innovation that is driven by a lead integrator on the commander's staff. When commanders, the neglected middle, and the tactical edge operate in harmony, innovation attains operational relevance. These actions will magnify the strengths of the neglected middle and recognize the group as innovators themselves. With such a culture it will be second nature for joint warfighters to flank the crater, translating tactical opportunities into operational and strategic victories. JFQ

Notes

¹ Jonathan Byrnes, "Middle Management Excellence," *Harvard Business School Working Knowledge*, December 5, 2005.

² William Guth and Ian MacMillan, "Strategy Implementation Versus Middle Management Self-Interest," *Strategic Management Journal* 7, no. 4 (1986).

³ Eric Ries, *The Startup Way: How Modern Companies Use Entrepreneurial Management*

to *Transform Culture and Drive Long-Term Growth* (New York: Currency, 2017), 195.

⁴ This staff component would reside at the lowest formation capable of independent combined arms operations. During the Civil War it was the Corps; in modern times it is the Brigade Combat Team.

⁵ Doris Kearns Goodwin, *Team of Rivals: The Political Genius of Abraham Lincoln* (New York: Simon and Schuster, 2005), 648.

⁶ James M. McPherson and James K. Hogue, *Ordeal by Fire: The Civil War and Reconstruction*, 4th ed. (Boston: McGraw Hill Companies, Inc., 2010), 458.

⁷ Curtis S. King, William G. Robertson, and Steven E. Clay, *Staff Ride Handbook for the Overland Campaign, Virginia, 4 May to 15 June 1864: A Study in Operational-Level Command* (Fort Leavenworth, KS: Combat Studies Institute Press, 2009), 41; and Earl J. Hess, *The Rifle Musket in Civil War Combat: Reality and Myth* (Lawrence: University Press of Kansas, 2008), 7–8.

⁸ *Ibid.*, 20–21.

⁹ *Ibid.*, 85.

¹⁰ *Ibid.*, 86–87.

¹¹ John F. Schmutz, *The Battle of the Crater: A Complete History* (Jefferson, NC: McFarland and Company, Inc., 2009), 19–20.

¹² Bruce Catton, *A Stillness at Appomattox* (New York: Doubleday, 1953), 220.

¹³ Earl J. Hess, *Into the Crater: The Mine Attack at Petersburg* (Columbia: University of South Carolina Press, 2010), 2.

¹⁴ Schmutz, *The Battle of the Crater*, 52.

¹⁵ Jim Corrigan, *The 48th Pennsylvania in the Battle of the Crater: A Regiment of Coal Miners Who Tunneled under the Enemy* (Jefferson: McFarland and Company, Inc., 2006), 44.

¹⁶ Hess, *Into the Crater*, 2.

¹⁷ *Ibid.*, 53.

¹⁸ Corrigan, *The 48th Pennsylvania in the Battle of the Crater*, 22–24.

¹⁹ War Department, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, ser. 1, vol. 40, pt. 2 (Washington, DC: Government Printing Office, 1892), 608.

²⁰ Hess, *Into the Crater*, 11.

²¹ In order to discreetly remove dirt, the miners built crates from their hard tack cracker boxes, reinforced with iron bands from the barrels that held their salted pork. See *The War of the Rebellion*, ser. 1, vol. 40, pt. 2, 397.

²² Hess, *Into the Crater*, 11.

²³ Corrigan, *The 48th Pennsylvania in the Battle of the Crater*, 39.

²⁴ The miners built a wooden duct that ran from the opening down the length of the mine. The troops dug a ventilation shaft upward and lit a fire underneath. When a canvas partition sealed the tunnel, the fire's chimney effect drew good air to the mine face. See *ibid.*, 36–37.

²⁵ Schmutz, *The Battle of the Crater*, 58.

²⁶ Hess, *Into the Crater*, 15.

²⁷ *Ibid.*

²⁸ *Ibid.*, 27.

²⁹ *The War of the Rebellion*, ser. 1, vol. 40, pt. 2, 611.

³⁰ Hess, *Into the Crater*, 27.

³¹ *Ibid.*, 27.

³² Richard Slotkin, *No Quarter: The Battle of the Crater, 1864* (New York: Random House, 2009), 33.

³³ Hess, *Into the Crater*, 29.

³⁴ *Ibid.*

³⁵ Schmutz, *The Battle of the Crater*, 90.

³⁶ *Ibid.*, 98.

³⁷ U.S. Senate, *Report of the Joint Committee on the Conduct of the War: Battle of Petersburg*, 38th Cong., 2nd sess. (Washington, DC: Government Printing Office, 1865), 113.

³⁸ Slotkin, *No Quarter*, 33.

³⁹ *Ibid.*, 73.

⁴⁰ Corrigan, *The 48th Pennsylvania in the Battle of the Crater*, 61.

⁴¹ Abatis consist of felled trees positioned with branches facing the enemy. A cheval-de-frise features a log with sharpened stakes inserted into all sides. See Catton, *A Stillness at Appomattox*, 202.

⁴² *Ibid.*, 245.

⁴³ Scholars have exhaustively analyzed the controversy around Burnside selecting a USCT division to lead the assault during the Battle of the Crater. See Richard Slotkin's *No Quarter*, 73, for the most wholesome analysis of the USCT controversy.

⁴⁴ Catton, *A Stillness at Appomattox*, 238.

⁴⁵ McPherson and Hogue, *Ordeal by Fire*, 461.

⁴⁶ Hess, *Into the Crater*, 62.

⁴⁷ *Ibid.*, 59.

⁴⁸ Catton, *A Stillness at Appomattox*, 239.

⁴⁹ *Ibid.*, 80.

⁵⁰ McPherson and Hogue, *Ordeal by Fire*, 461.

⁵¹ Catton, *A Stillness at Appomattox*, 244–246.

⁵² Schmutz, *The Battle of the Crater*, 152.

⁵³ Catton, *A Stillness at Appomattox*, 246.

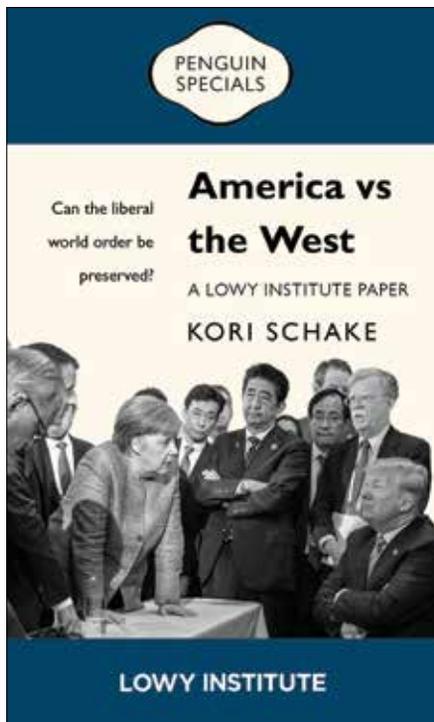
⁵⁴ McPherson and Hogue, *Ordeal by Fire*, 461.

⁵⁵ Quoted in McPherson and Hogue, *Ordeal by Fire*, 462.

⁵⁶ Hess, *Into the Crater*, xi.

⁵⁷ King, Robertson, and Clay, *Staff Ride Handbook for the Overland Campaign, Virginia, 4 May to 15 June 1864*, 7.

⁵⁸ Quoted in Schmutz, *The Battle of the Crater*, 340.



America vs. the West: Can the Liberal World Order Be Preserved?

By Kori Schake

Penguin Random House Australia,
2018

192 pp. \$13.95

ISBN: 978-0143795360

Reviewed by Brittany Bounds

They say a picture is worth a thousand words. The photo from the 2018 G7 summit on the cover of Kori Schake's *America vs. the West: Can the Liberal World Order Be Preserved?* sets the tone for the scathing review to follow. Schake is well known in the fields of national and strategic studies and is currently the Deputy Director General of the International Institute of Strategic Studies after spending time at the conservative Hoover Institute of War and Peace at Stanford University. Most tellingly, however, is that she is a "serenely unrepentant signatory of the Never Trump letters," as her short biography lauds in the introduction. Schake's background and tenuous relationship with President Donald Trump

are wise to keep in mind while evaluating her arguments, which are strong. In this book, Schake does not sugarcoat her opinions about the negative direction in which Trump has taken U.S. foreign policy.

Schake sets out to answer the question about President Trump's threat to the liberal international order and what could replace it should it collapse. She defines three elements of the order that the United States constructed at the end of World War II: security relationships, economic prosperity, and liberal political values. Because all of these are inextricably linked, Schake is pessimistic about the current role of the United States in the international order: "Donald Trump is destroying the presumption of an engaged America as the rule-setter and enforcer of the liberal international order." Yet Schake makes three important admissions: the United States has always had an uncomfortable acceptance with holding the role of the global hegemon; the liberal international order is more durable than the contingencies that the country has endured over the last 70 years; and Trump (or at least his rhetoric) represents some important continuities in U.S. foreign policy. In fact, she states that U.S. policy toward Russia is even better than under the Barack Obama administration, and Trump's policy has been "better than anticipated" on China.

Schake gives an efficient summation of the great power competition with China and Russia, two rising authoritarian capitalist countries. She conveys little concern about Russia's ability to dominate or reshape the global order in its image due to its low economic growth rates, overreliance on oil, lack of innovation, weak military strength, and widespread corruption both at home and abroad. China, however, poses more of a threat to the international order; it opted into the liberal order without liberalizing, which challenges the Western belief that as countries grow more prosperous, they become more liberal. One facet of this risk concerns China's willingness to replace dollar dominance with the yuan, which would weaken the U.S. economic foreign policy tool of sanctions. Yet she

shows how China is a long way from achieving global dominance with its low per capita gross domestic product, dependence on foreign markets, and beligerence toward its regional neighbors.

In the shortest chapter, Schake explains her perspective on the rise of populism in the United States and Western countries. Its growth is precisely a result of the success of the liberal international order, which has allowed for security and ultimately complacency. It is not yet clear if the current political illiberalism is generated by economic stagnation or cultural malaise—nor do we know if this is a permanent political realignment or part of the cyclical revitalizations the United States has experienced before. Schake's fear is that a second Trump term without alterations in policy approach would provide the time to set new patterns, prompting allies to find ways around the United States and giving adversaries a window to take advantage of the lack of unity.

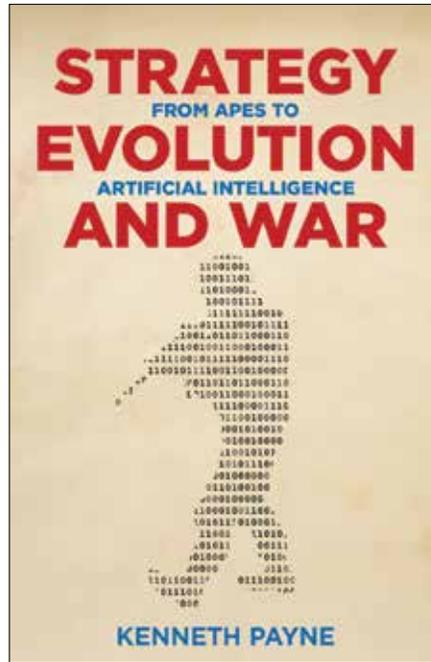
In the book's conclusion, Schake works out several possible scenarios for an alternative to the liberal international order if the United States continues to disengage. This serves not as a warning to the United States but as a caution mostly to other countries—the Western middle powers—for the next 10 to 15 years as China tests its authoritarian capitalism. One model for other countries is constructive engagement, whether through personal relationships with the Trump family (as prime ministers Emmanuel Macron, Shinzo Abe, and Theresa May have tried) or quiet, practical cooperation, as seen through Sweden and Finland's new defense agreements with the Department of Defense without White House involvement. Yet these approaches have been problematic in the past, as they have been unable to influence Trump's choices and, in some cases, Trump has vetoed decisions made around him, such as at the 2018 North Atlantic Treaty Organization summit.

A second method to get around the Trump administration is estrangement, by which Schake means the European Union (EU) stepping in for the United States: a "rise of the rest." For some,

this would be ideal, for it would signal the sturdiness of the international rules and norms that no longer rely on U.S. politics. But she repudiates this proposal of a concert of nations with a list of complications around the fallacy of liberalism. In her pessimism about Trump, she does not include the option that the President will alter his behavior or his approach to foreign relations, stating that it would be “unlikely in the extreme.” Her final suggestion is a passive one: wait. Buying time may allow the United States to “come to its senses,” China to stumble, Russia to envision a better country, and the EU to strengthen. In the meantime, she advocates for educating our societies on the value of international norms and institutions. Ultimately, Schake is optimistic that the liberal order will be sustained, even though it will have to be fought for and rejuvenated by either the United States or a concert of nations.

Schake weaves other themes through the narrative as well—democratizing technologies, globalization, partnerships, Hegelian liberalism, economics, and almost every region of the world. This short read is a perfect way to join the conversation on the great power competition and the future of the international order. JFQ

Dr. Brittany Bounds is an Associate Professor in the Institute for National Strategic Studies at the National Defense University.



Strategy, Evolution, and War: From Apes to Artificial Intelligence

By Kenneth Payne
Georgetown University Press, 2018
269 pp. \$32.95
ISBN: 978-1626165809

Reviewed by Ryan Shaffer

One of the major issues facing the future of technology and defense is how artificial intelligence will reshape military strategy. Though artificial intelligence is not a new concept, advances in technology are rapidly expanding artificial intelligence’s potential capabilities. Exploring prospects for the future of war and strategy, Kenneth Payne examines the development of military strategy with two revolutions he identifies as early human cognitive transformation from 100,000 years ago, and the present changes in cognition from artificial intelligence. Payne concludes that strategy will be transformed in the future because machines are going to make key decisions for war without human cognition. Describing how strategy is a psychological activity shaped by human biology and development, he admits the speculative nature

of his argument and notes that it draws from other authors on evolutionary psychology. Payne warns that one significant change for military strategy caused by artificial intelligence is that machines will make decisions based on principles that are not exclusively human.

In the first of the book’s three parts, Payne explores human strategy’s origins in evolutionary history. He describes how human evolution has a significant role in understanding strategic interests, such as the need to belong to a group rather than just to dominate physically. Warfare is a significant part of human evolution, and thus we have developed psychologically for the challenge. As for behaviors imbedded in human psychology, Payne explains conscious and unconscious biases and notes that decisionmaking processes are not always rational because emotion shapes strategies, which are justified afterward.

In the second part, Payne looks at culture’s relationship with war and technology to understand the effects they have on human strategic behavior. Discussing case studies from ancient Greece with attention to the hoplite panoply (a weapons system of infantrymen with body armor, shields, and spears), Payne concludes that strategy maintains a deep-seated psychological basis throughout history, across countries and cultures. Even with revolutionary technological advances from the Napoleonic to the nuclear eras, Payne also finds that technology does not alter strategy’s innate psychological foundation.

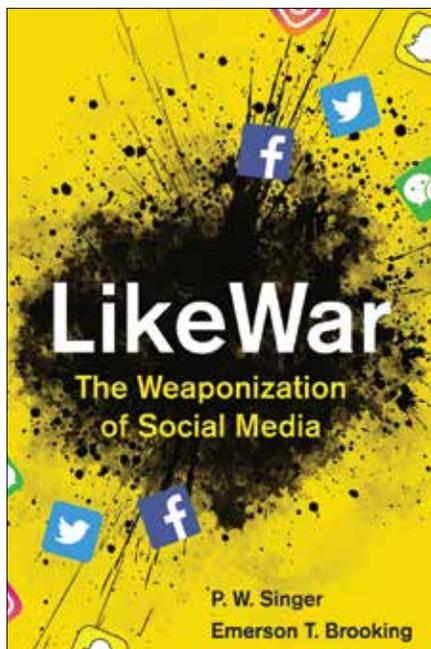
The final part focuses on artificial intelligence’s potential influence on military strategy. Payne explores what is feasible with tactical artificial intelligence, citing examples such as combat flight simulators and machine learning, and argues that artificial intelligence will shift the balance in conflict to favor the attacker and accelerate the initial steps to war. He believes these changes will affect strategic thinking by reshaping attitudes about risk and leaving decisionmakers removed from some decisions. Looking to the future, Payne offers three aspects of a hypothetical artificial general intelligence—a more

powerful and advanced artificial intelligence than what is possible now—and argues that military strategy will change as machines become more flexible and autonomous. In particular, issues of friction and uncertainty will continue to be part of human conflict, but machines acquire increasingly higher decision roles without human cognition.

Payne concludes the book by putting artificial intelligence into broad historical context with the advent of the written word, which altered the psychological basis of strategy. Because artificial intelligence is not just information-processing technology but also decisionmaking technology, advances in artificial intelligence will mark a significant departure for strategy as decisions are made without human motivations. Payne recommends that one way to protect against artificial intelligence making decisions devoid of human goals is to inject it with biological intelligences wherein a human–artificial intelligence hybrid would offer human motivations and heuristics.

Although *Strategy, Evolution, and War* is highly speculative, this book provides valuable insights about the trajectory of military strategy shaped by artificial intelligence. Payne is upfront about the book's limitations, including the notional aspects of his argument, the broad themes, and the oversimplification of the complex evolutionary processes. Indeed, readers wanting more empirical research and detailed scientific discussion will be disappointed. Payne's theories raise important questions about the future of artificial intelligence and strategy in broad terms, but they sometimes neglect ethical issues. Nonetheless, even if aspects of Payne's argument are hypothetical, his book offers valuable ideas about how artificial intelligence could change military strategy in the future. JFQ

Dr. Ryan Shaffer is a historian who researches terrorism and political violence.



LikeWar: The Weaponization of Social Media

By Peter W. Singer and Emerson T. Brooking
Houghton Mifflin Harcourt, 2018
416 pp. \$28.00
ISBN: 978-1328695741

Reviewed by Brett Swaney

There is a battlefield you cannot see, a digital ocean of social media, news feeds, botnets, sock puppets, neural nets, and trolls. In *LikeWar*, defense analysts Peter W. Singer and Emerson T. Brooking examine the role of social media in reshaping the character of war and politics. The result is a thematic and insightful overview of the weaponization of social media and the power of narrative in conflict.

The authors frame the discussion by tracing the development of communications and information technologies through the telegraph, radio, television, the Internet, Web 2.0, and social media. At each phase, new communications technology subverts some powers and people while crowning new ones in their place. Each new evolution of information and communications technology has revolutionized tactics, strategy, and

the discourse around war. This makes the utopian vision of the Internet and social media often espoused by Silicon Valley tycoons feel naïve in hindsight—a reckoning that is already well under way.

Social media was founded on the optimistic premise that the closer knit and communal world would be a better one. Yet that same openness and connection of social media platforms has also made these spaces the perfect place for continual and global conflict. The so-called Islamic State advanced on Mosul riding a wave of social media that broke the Iraqi defenders before they even arrived. A World of Warcraft gamer used geolocation and crowdsourced social media to reveal the truth behind the downing of Malaysia Airlines Flight 17, and Harry Potter character Albus Dumbledore used his army to foster community to combat violent extremists. These fascinating vignettes reinforce the reality that social media has empowered new actors and individuals in conflict with tremendous reach. Conflict is global, and we are all connected to the virtual battlefield, seamlessly able to participate in the narrative battlespace.

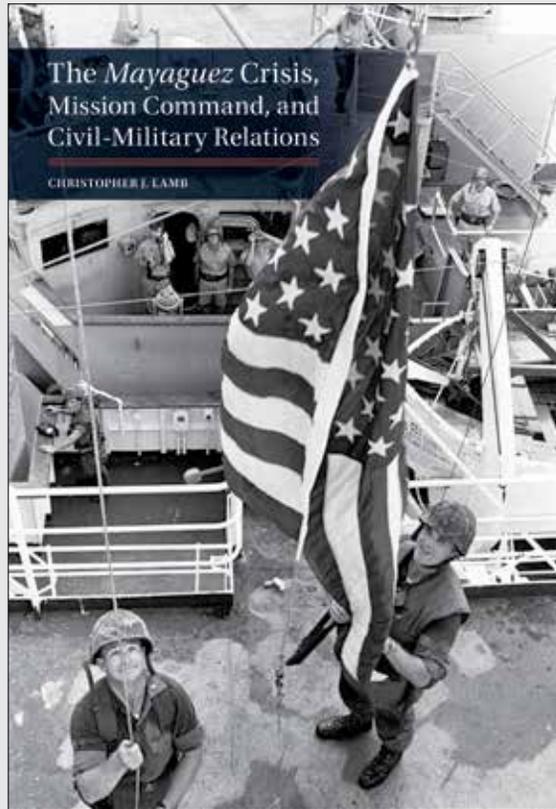
In modern wars, Singer and Brooking remind us, the online fight is for attention and influence; the ability to shape the narrative in and around conflict is just as important as the physical conflict. Rupert Smith in *The Utility of Force* (Knopf, 2007) and Lawrence Freedman in *The Future of War* (PublicAffairs, 2017) have noted the importance of narrative, and governments around the world have been busy adapting. The Israel Defense Forces have pioneered the development of specialized units and tactics dedicated to social media and the recruitment to man those units. Russia too has rapidly embraced the new battlespace with an army of social media “trolls,” a panoply of state media, and relentless botnets. China is also singled out for its disturbing model of social media–enabled, state-managed systems of mass control. Unfortunately, there is a noticeable lack of discussion regarding U.S. military efforts to grapple with social media in conflict, especially in the counterinsurgency space where there has been significant effort.

Where Singer and Brooking break new ground is in their observation that even as national militaries reorient themselves to fight global information conflicts, the domestic politics of nations have not remained in splendid isolation. Singer and Brooking suggest that the two spheres of war and politics have become more tightly linked. Just as states and conflict actors use the Internet to manipulate, so too do political candidates and activists. Online there is little difference between the tactics required to “win” either a violent conflict or a peaceful campaign. Singer and Brooking are not afraid to challenge the level of preparedness or even the seriousness with which the national security establishment, Congress, and social media companies take these issues. However, there is curiously little discussion regarding the implications of national governments attempting to combat “dangerous speech” in free societies, or the regulatory efforts concerning personal data already underway in many Western nations.

Nonetheless, social media is a seismic shift for military strategy. As Singer and Brooking point out, Carl von Clausewitz would have understood the nature of social media in conflict today. It fits entirely within his articulation of war as politics by other means. At the time, this continuum of conflict was revolutionary and flew in the face of those who believed that war and politics were separate worlds governed by distinct rules. Despite these solid philosophical underpinnings, Singer and Brooking fail to convince that social media has fundamentally changed the nature of war itself.

Smartly researched, engaging, and technically astute, *Like War* is a worthwhile primer on the new information battlespace for national security professionals. The authors argue convincingly that war and politics have never been more intertwined. With colorful and engaging prose, the authors implore us to treat this new virtual battleground with the gravity it deserves. JFQ

Brett Swaney is a Research Analyst in the Institute for National Strategic Studies at the National Defense University.



New from the Office of Joint History

The Mayaguez Crisis, Mission Command, and Civil-Military Relations

By Christopher J. Lamb
2018 • xxiv + 284 pp.

President Gerald R. Ford’s 1975 decision to use force after the Cambodians seized the USS *Mayaguez* merchant ship is one of the best documented but least understood crises in U.S. history. U.S. behavior is still explained as a rescue mission, a defense of freedom of the seas, an exercise in realpolitik, a political gambit to enhance Ford’s domestic political fortunes, and a national spasm of violence from frustration over losing Vietnam. Widespread confusion about what happened and why it did contribute to equally confused explanations for U.S. behavior.

Now, with new sources and penetrating analysis, Christopher J. Lamb’s *The Mayaguez Crisis, Mission Command, and Civil-Military Relations* demonstrates how three decades of scholarship mischaracterized U.S. motives and why the common allegation of civilian micromanagement during the crisis is wrong. He then extracts lessons for current issues such as mission command philosophy, civil-military relations, and national security reform. In closing he makes the argument that the incredible sacrifices made by U.S. Servicemen during the crisis might have been avoided but were not in vain.

2K12 Kub mobile surface-to-air missile system fires during multinational live-fire training exercise Shabla 19, in Shabla, Bulgaria, June 12, 2019 (U.S. Army/Thomas Mort)



Getting the Joint Functions Right

By Thomas Crosbie

In July 2017, the Chairman of the Joint Chiefs of Staff announced a special out-of-cycle revision to joint doctrine, adding information to the joint functions. The significance of this policy change was highlighted by the Secretary of Defense in a September 2017 endorsement, where he stressed that inclusion in the joint functions signaled an “elevation” of information throughout Department

of Defense (DOD) thinking and practice.¹ A 2018 article by Alexis G. Grynkewich in this journal elaborated on why this matters to the national security community.² Nevertheless, despite these clear signals that DOD takes the joint functions seriously, and despite their centrality in military doctrine, the joint functions remain little understood by those who have not served in an operational staff role.

This article provides the first organizational history of the joint functions in order to better understand why differences persist in how this concept is implemented in the United States versus its North Atlantic Treaty Organization (NATO) partners. Doing so allows us to better understand enduring challenges in interoperability and persistent cultural clashes within the Alliance. The history reveals that today’s joint functions are built around a core of four kinetic principles (leadership or command and control [C2], maneuver, firepower, and protection), to which subsequent revisions have attempted to add a range of “softer” military fields (intelligence, information, sustainment, and civil-military cooperation), sometimes successfully, sometimes not.

The history of the joint functions is a history of overcoming the resistance in U.S. military thought to placing soft and hard elements of the contemporary battlefield on an equal footing. Viewed from this perspective, another set of questions is raised concerning the persistence

Dr. Thomas Crosbie is an Assistant Professor in the Centre of Joint Operations, Institute of Military Operations, at the Royal Danish Defence College.

of U.S. vulnerabilities to foreign military powers focused on exploiting the gray zone between hard and soft power.

Combining Arms and Domains

Jointness is not easy, but it is good—that has been the clear consensus from scholars and practitioners for decades, amply demonstrated in the pages of this journal.³ What makes it difficult is the clash of cultures, command structures, and egos that inevitably occurs when two or more distinct organizations are tasked with working hand-in-glove.⁴ In this sense, the challenges of jointness are not unique to the military and are faced by any complex organization that needs levels of coordination. The benefits are, however, unique, as Robert Leonhard and others have argued.⁵ All else being equal, we expect a force that is better at combining arms and crossing domains will win out over its competitors because jointness enables commanders to compensate for the weaknesses in one weapons system with the strengths of another and to exploit a wider array of vulnerabilities in one's opponent while minimizing one's own exposure to risk. Axiomatically, then, jointness provides benefits in efficiency, freedom of action, and flexibility.⁶

The spirit of combining instruments of power informs policy development at virtually every level and is shared by most, if not all, of America's allied militaries. By contrast, the failure to combine is routinely disparaged as evidence of Service parochialism or even corruption. While critics can be found, the weight of historical evidence and of informed opinion is clearly on the side of jointness.

What does this mean in practice? Most important during times of conflict, instruments of power are combined and integrated through the joint force commander and his or her staff. Officially, a joint force *is* joint when it includes elements from more than one Service. However, it only *does* jointness when it actively combines instruments of power in some productive way. The term *joint functions* has emerged in doctrine as a shorthand way of expressing those dimensions of conflict where combining

Table. The Joint Staff Directorates and Joint Functions

Joint Staff Directorates	Joint Functions
J1, Manpower and Personnel	No equivalent
J2, Intelligence	Intelligence
J3, Operations	Movement and maneuver + fires + protection
J4, Logistics	Sustainment
J5, Strategy, Plans and Policy	No equivalent
J6, Command, Control, Communications and Computers/Cyber	Command and control
J7, Joint Force Development	No equivalent
J8, Force Structure, Resources and Assessment	No equivalent

instruments of power is particularly useful. They are in this sense a sort of checklist to ensure that the latent potential of jointness is in fact being realized.

In U.S. doctrine there are today seven joint functions: intelligence, movement and maneuver, fires, information, protection, sustainment, and C2. For the rest of the NATO community, there are eight, since NATO doctrine also includes civil-military cooperation (CIMIC). Despite their importance doctrinally and organizationally, the joint functions are little known and rarely discussed in the national security community and are often poorly understood by officers entering joint staffs. This is not entirely surprising. The joint functions are a paradox of stability and change. On one hand, they are the pillars of operational doctrine, establishing a coherent framework for what a joint staff can and should do at the operational level of war. On the other hand, the list has undergone significant revision over the years, reflecting deep disagreements on which concepts merit inclusion—and even what each concept means. And while the term itself is fairly new, having only entered common usage with its inclusion in Joint Publication 3-0, *Joint Operations*, in 2006 (and adopted into NATO doctrine in 2011), it reflects ideas that have appeared off and on in U.S. Army doctrine for well over a hundred years.

The challenge facing doctrine writers is how to realize the latent benefits of jointness given real-world limitations in time, attention, and resources. That is where the joint functions come in. By focusing on a delimited set of prioritized areas where joint effects can be achieved,

a joint staff can give structure to the enormous complexity of contemporary military operations.

While a joint staff is designed to organize its work around the joint functions, the joint functions should not be confused with the Joint Staff Directorates (J1–J8), which they superficially resemble (see table). The relationship is clearly accounted for in doctrine. The purpose behind the staff directorates is to ensure that a joint staff has the right mix of expertise across key areas. The doctrine makes clear that an actual staff needs to break up the silos that can be created by the directorates, and instead the experts should mix together in a number of subgroups (listed in the doctrine as “centers, groups, bureaus, cells, offices, elements, working groups, and planning teams”⁷). Once reassigned to their subgroup, staffers need to achieve certain types of effects. The most important effects are sorted into six categories and are the joint functions mentioned above: C2, intelligence, fires, movement and maneuver, protection, and sustainment. More recently, as described below, U.S. and NATO doctrine have both changed to include information to this list, while NATO doctrine also includes CIMIC. Thus, while staffs are commonly divided into eight directorates and are expected to achieve effects through seven or eight functions, the two things are ultimately quite different.

The joint functions, then, were never intended to be another level of organization. Rather, they are a heuristic model for understanding descriptively the way power can be directed to achieve ends on the battlefield.

Figure 1. Elements of Combined Arms in FM 100-5 (1914–1962)

	1914	1923	1939	1941	1944	1949	1954	1962
Infantry	■	■	■	■	■	■	■	■
Engineers	■	■	■	■	■	■	■	■
Artillery*	■	■	■	■	■	■	■	■
Cavalry (Armor)**	■	■	■	■	■	■	■	■
Air Corps***	■	■	■	■	■	■	■	■
Signal Corps	■	■	■	■	■	■	■	■
Chemical Warfare	■	■	■	■	■	■	■	■
Medical	■	■	■	■	■	■	■	■
Quartermaster	■	■	■	■	■	■	■	■
Ordnance	■	■	■	■	■	■	■	■
Transportation	■	■	■	■	■	■	■	■
Military Police	■	■	■	■	■	■	■	■

Key:

* Until 1949, artillery was divided between normal and heavy field artillery.

** Until 1944, cavalry included both armored and horse cavalry.

*** In 1944, air power was discussed in a separate chapter.

Figure 2. Joint Functions in FM 100-5 (1968–1993), FM 3-0 (2001–2017), AJP 3 (2002–2019) and JP 3-0 (2006–2018)

	1968	1982–1993	2001	2008–2017	2002	2011–2019	2006–2010	2011–2017	2018
Command and Control	■	■	■	■	■	■	■	■	■
Movement and Maneuver	■	■	■	■	■	■	■	■	■
Fires	■	■	■	■	■	■	■	■	■
Protection	■	■	■	■	■	■	■	■	■
Intelligence	■	■	■	■	■	■	■	■	■
Sustainment	■	■	■	■	■	■	■	■	■
Information	■	■	■	■	■*	■	■**	■	■
CIMIC	■	■	■	■	■	■	■	■	■
Planning	■	■	■	■	■	■	■	■	■
Targeting	■	■	■	■	■	■	■	■	■

Key:

Green indicates U.S. Army doctrine, purple indicates U.S. joint doctrine, and blue indicates NATO doctrine.

* NATO doctrine in 2002 splits the Information function into “Public Information” and “Information Operations”

** U.S. JP 3-0 in 2006 (revised in 2008 and 2010) lists information tasks under the heading “Other Activities and Capabilities”

Joint Functions in Army Doctrine, 1905–1954

But why these particular functions, and what does it mean for the integrity of the list that this has changed and remains contested? To answer these questions, it is necessary to briefly look

back over the history of the doctrine. The starting point is 1905 with the publication of the U.S. Army’s first combined arms manual, Field Manual (FM) 100-5, *Field Service Regulations*.⁸ Surprisingly, the first extended discussion of what combining arms actually

entails would not arrive until the fourth edition (1914), where combined arms are described as the effective balancing of the Infantry, Artillery, Cavalry, Special Troops (mostly Engineers), and Heavy Field Artillery.⁹

In these early days, manual writers focused on what made up the combined arms. The 1923 edition adds the Signal Corps and Air Service and renames “Special Troops” as “Engineers.” It also states clearly the value of combining arms: “No one arm wins battles. The combined employment of all arms is equal to success.”¹⁰ Five more editions followed (in 1939, 1941, 1944, 1949, and 1954), with each adding elements to the list. By 1954, the list had grown to include 10 components: Infantry, Armor, Artillery, the Corps of Engineers, Signal Corps, Chemical Corps, Army Medical Corps, Quartermaster Corps, Transportation Corps, and Military Police Corps. So unwieldy was this list that the 1962 edition cut back to the original 1923 list: Infantry, Engineers, Artillery, and Armor. Notably, information and intelligence elements are entirely absent throughout, since these were viewed as separate from the combined arms.

What we can conclude is that Army doctrine writers have long been committed to the idea that the combining of land power elements enables gains on the battlefield. This belief has tended toward a kitchen-sink effect, with more and more elements highlighted as standing to benefit from combination until order is restored by a return to first principles—clearly visible in figure 1. Prodigality balances against parsimony.

A quirk of the doctrine up to this point is that the writers never quite got around to explaining how a commander should manage all of this complexity. The doctrine exhorted combined effects and described the elements that needed to be combined, but it failed to specify how the elements should be balanced. In hindsight, then, FM 100-5 from 1905 through 1954 had fairly modest aims, ensuring only that future leaders, when called on to lead a campaign, would at least know what arrows were in their quiver.

Joint Functions in Army, Joint, and Alliance Doctrine, 1968–2019

The major intellectual breakthrough came with the doctrine revisions of the 1960s, when the doctrine writers finally began to nail down the specific ways combining arms can lead to better outcomes (see figure 2). In the 1968 revision of FM 100-5, the writers switched from presenting a laundry list of functional elements that can be combined to identifying the types of needs that these elements can address. The doctrine now described the need for “multicapable forces” that combine their elements to achieve better outcomes in five fields: intelligence, mobility, firepower, combat service support, and C3 (command, control, and computers).¹¹

For a time, this insight was forgotten. When General William E. DePuy drafted the famous “Active Defense” edition of FM 100-5 (1976), he dispensed with much of the verbiage and most of the concepts of earlier manuals, preferring a livelier style, with vivid examples drawn from recent experience. Dissatisfaction with DePuy’s manual led General Donn A. Starry to oversee the publication of the equally renowned “AirLand Battle” edition (1982).¹² Here, DePuy’s ideas about active defense were blended with Starry’s ideas about AirLand Battle and with the 1968 manual’s ideas of multicapable forces. In the 1982, 1986, and 1993 editions, this intuition was refined through discussion of the so-called elements of combat power, now listed as maneuver, firepower, protection, and leadership, which replaced C3. This tighter focus—dropping intelligence and combat service support from the discussion—perfectly reflects what has been described as the Army’s cultural shift toward preparing for high-tempo, conventional force engagements.¹³

Despite the prominent place given to these “elements of combat power” in the Army manuals of 1982, 1986 and 1993, the first joint publication on the topic, Joint Publication (JP) 3-0, *Doctrine for Joint Operations*, 1993, makes no mention of these principles. Nor do they appear in the 1995 or 2001

editions. Nevertheless, Army doctrine writers were still very much committed to these concepts, and in the 2001 edition of Army operational doctrine (redesignated from FM 100-5 to FM 3-0), a new element of combat power was added to the list: information. This was not to last. Interestingly, the next edition, released in 2008, drops information and brings back intelligence, which had been missing since the 1968 edition, and defines these elements of combat power as “warfighting functions.” This remains, as of 2018, the current state of Army thought, which builds its description of the Army’s capabilities around six warfighting functions: mission command (the new name for C2), movement and maneuver, intelligence, fires, sustainment, and protection.

Looking at the joint and Alliance levels, the idiosyncrasies of Army thought come into focus. In 2002, NATO published its first joint operations doctrine, Allied Joint Publication (AJP) 3, *Allied Joint Operations*.¹⁴ The imprint of U.S. Army doctrine is plain to see in this document, with the elements of combat power now renamed “Joint Capabilities,” which included most of the persistent elements of the Army manuals (C2, maneuver, fires, intelligence, and sustainment, renamed logistics), dropped protection, and added a number of unfamiliar items: planning, targeting, and CIMIC. Also included were two information functions: information operations and public information. Where Army doctrine downgraded the role of information in this period, NATO emphasized it.

Meanwhile, American joint doctrine was revised in 2006 to finally incorporate the Army’s elements of combat power, now named for the first time as *joint functions*. Where NATO doctrine split information between information operations and public information, U.S. joint doctrine included it in the vague category “Other Activities and Capabilities,” a seventh joint function encompassing psychological operations and deception. The 2011 and 2017 versions of JP 3-0 dispensed with information entirely but brought it back as a fully fledged joint function with much fanfare in 2018.¹⁵

NATO and U.S. joint doctrine were finally coordinated with the revision of NATO AJP-3, *Allied Joint Doctrine for the Conduct of Operations*, in 2011.¹⁶ NATO’s joint capabilities became joint functions. Public information was folded into information operations, and the outlier concepts planning and targeting were dropped entirely. In 2019, the doctrine underwent one last revision, with information operations renamed simply information to align it with the 2017–2018 U.S. doctrine. The current state of NATO doctrine thus defines eight joint functions: command and control, maneuver, intelligence, fires, sustainment, information, protection, and CIMIC. The current state of U.S. joint doctrine is identical, except it excludes CIMIC.

Joint Functions Doctrine: Lessons Learned

At the center of military innovation since World War II has been the promise of realizing tactical, operational, and strategic gains through combining arms and crossing domains. Combining, integrating, and making joint: these are the explicit goals of the joint force, DOD, and the unified combatant commands, and they are now routinely celebrated by the separate Services as well. The joint functions are the doctrinal culmination of taking jointness seriously, and the shifts we have traced in what constitutes the joint functions can be taken as a broader history of joint thought at the operational level of war.

What, then, should we make of this storied history? The most important lesson concerns the nature of doctrine itself. Although the joint functions may seem evolutionary, their history is filled with starts and stops, with detours and roadblocks, each signaling a shift in how the doctrine writers understood the nature of war. The impermanence and inconsistencies of the doctrine studied here can serve as a reminder that no doctrine is ever final, nor will it ever replace informed judgment.

Similarly, there is a lesson here in the false appearance of uniformity. As the doctrine has developed, the writers seek agreement in language and expression,

but this may mask deeper disagreements in the actual meanings of words. NATO joint functions are not exactly DOD joint functions—nor are they Army warfighting functions.

Finally, this brief history raises another set of questions that demand reflection. If the joint functions express the military's collective wisdom on how to best combine arms and cross domains—how to do jointness—then what should we conclude from the reluctance of the doctrine to put soft power concepts (information, most notably, but also intelligence and CIMIC) on equal footing as hard power concepts (fires, maneuver, protection)? Does the adoption of information as a joint function in 2017 resolve this problem, or do these same vulnerabilities persist? These and other questions about how to develop the right doctrine at the right time remain to be answered.

This historical understanding of the joint functions is intended to overcome the longstanding reluctance to place soft power elements of the modern battlefield on the same footing as hard power elements. Given that competitors are increasingly oriented toward exploiting our political vulnerabilities, getting the joint functions right—striking the right balance between hard and soft power—is more important than ever. JFQ

Notes

¹ James N. Mattis, memorandum, "Information as a Joint Function," September 15, 2017, available at <www.rmnda.army.mil/records-management/docs/SECDEF-Endorsement_Information_Joint%20Function_Clean.pdf>.

² Alexis G. Grynkeiwich, "Introducing Information as a Joint Function," *Joint Force Quarterly* 89 (2nd Quarter 2018), 6–7.

³ See, for example, John Gordon IV, "Joint Power Projection: Operation Torch," *Joint Force Quarterly* 3 (2nd Quarter 1994), 60–69; Williamson Murray, "The Evolution of Joint Warfare," *Joint Force Quarterly* 31 (3rd Quarter 2002), 30–37; and William O. Odom and Christopher D. Hayes, "Cross-Domain Synergy: Advancing Jointness," *Joint Force Quarterly* 73 (2nd Quarter 2014), 123–128.

⁴ Jan Angstrom and J.J. Widen, *Contemporary Military Theory: The Dynamics of War* (London: Routledge, 2015), 93–109.

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

JP 1, *Doctrine for the Armed Forces of the United States*

JP 2-0, *Joint Intelligence*

JP 3-10, *Joint Security Operations*

JP 3-31, *Command and Control for Joint Land Operations*

JP 5-0, *Joint Planning*

JP 6-0, *Joint Communications System*

JPs Revised (signed within last 6 months)

JP 3-02, *Amphibious Operations*

JP 3-07.4, *Joint Counterdrug Operations*

JP 3-09, *Joint Fire Support*

JP 3-16, *Multinational Operations*

JP 3-17, *Air Mobility Operations*

JP 3-30, *Command and Control of Joint Air Operations*

JP 4-0, *Joint Logistics*

JP 4-04, *Contingency Basing*

JP 4-09, *Distribution Operations*

JP 4-10, *Operational Contract Support*

⁵ Robert Leonhart, *The Art of Maneuver: Maneuver Warfare Theory and AirLand Battle* (New York: Ballantine Books, 1991), 93–94. See also Angstrom and Widen, *Contemporary Military Theory*, 95.

⁶ Angstrom and Widen, *Contemporary Military Theory*, 95.

⁷ Joint Publication (JP) 3-33, *Joint Task Force Headquarters* (Washington, DC: The Joint Staff, 2007).

⁸ Clinton J. Ancker III, "The Evolution of Mission Command in U.S. Army Doctrine, 1905 to the Present," *Military Review* (March–April 2013), 42–52. For a fuller history of U.S. Army doctrine, see Walter E. Kretchick, *U.S. Army Doctrine: From the American Revolution to the War on Terror* (Lawrence: University Press of Kansas, 2011).

⁹ Field Manual (FM) 100-5, *Field Service Regulations* (Washington, DC: Government Printing Office, 1914), 74–76.

¹⁰ FM 100-5, *Field Service Regulations* (Washington, DC: Government Printing Office, 1923), 11.

¹¹ FM 100-5, *Operations of the Army Forces in the Field* (Washington, DC: Headquarters Department of the Army, 1968), 1–5.

¹² The story of the 1976 and 1982 versions of FM 100-5 is recounted in Romie L.

Brownlee and William J. Mullen III, *Changing an Army: An Oral History of General William E. DePuy, USA Retired* (Washington, DC: U.S. Military History Institute and U.S. Army Center of Military History, 1986); and John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine, 1973–1982* (Fort Monroe, VA: Historical Office, U.S. Army Training and Doctrine Command, 1984).

¹³ Michael R. Melillo, "Outfitting a Big-War Military with Small-War Capabilities," *Parameters* (Autumn 2006), 22–35.

¹⁴ Allied Joint Publication (AJP) 3, *Allied Joint Operations* (Brussels: North Atlantic Treaty Organization [NATO], September 1, 2002).

¹⁵ Grynkeiwich, "Introducing Information as a Joint Function."

¹⁶ AJP-3(B), *Allied Joint Doctrine for the Conduct of Operations* (Brussels: NATO, March 16, 2011).

Chairman Xi Remakes the PLA

ASSESSING CHINESE MILITARY REFORMS



Edited by Phillip C. Saunders, Arthur S. Ding, Andrew Scobell,
Andrew N.D. Yang, and Joel Wuthnow

New from NDU Press

Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms

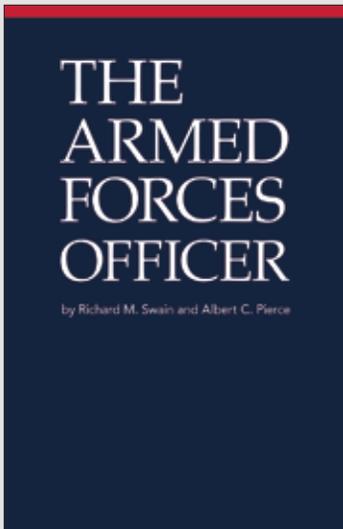
Edited by Phillip C. Saunders, Arthur S. Ding,
Andrew Scobell, Andrew N.D. Yang,
and Joel Wuthnow
2019 • 782 pp.

China's current military reforms are unprecedented in their ambition and in the scale and scope of the organizational changes. Virtually every part of the People's Liberation Army (PLA) now reports to different leaders, has had its mission and responsibilities changed, has lost or gained subordinate units, or has undergone a major internal reorganization. Drawing on papers presented at two conferences co-organized by the U.S. National Defense University, RAND, and Taiwan's Council of Advanced Policy Studies, this edited volume brings together some of the world's best experts on the Chinese military to analyze the various dimensions of the reforms in detail and assess their implications for the PLA's ability to conduct joint operations, for the Chinese Communist Party's control of the army, and for civil-military integration.

The contributors review the drivers and strategic context underpinning the reform effort, explore the various dimensions of PLA efforts to build a force capable of conducting joint operations, consider the implications for the PLA services, and examine Xi Jinping's role in driving the reforms through and using them to strengthen control over the military. The chapters chronicle successes and outstanding

problems in the reform effort, and consider what the net effect will be as the PLA strives to become a "worldclass" military by mid-century, if not much sooner.

Available at <<http://ndupress.ndu.edu/Publications/Books/Chairman-Xi-Remakes-the-PLA>>



New from NDU Press

The Armed Forces Officer

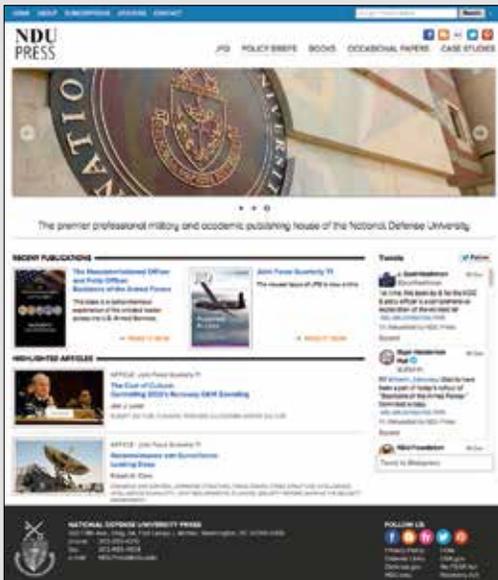
2017 • 212 pp.

From the Foreword by General Joseph F. Dunford, Jr., Chairman of the Joint Chiefs of Staff:
“In 1950, the great Soldier-Statesman George C. Marshall, then serving as the Secretary of Defense, signed a cover page for a new book titled *The Armed Forces Officer*. That original version of this book was written by none other than S.L.A. Marshall, who later explained that Secretary Marshall had ‘inspired the undertaking due to his personal conviction that American military officers, of whatever service, should share common ground ethically and morally.’ Written at the dawn of the nuclear age and the emergence of the Cold War, it addressed an officer corps tasked with developing a strategy of nuclear deterrence, facing unprecedented deployments, and adapting to the creation of the Department of Defense and other new organizations necessary to manage the threats of a new global order.

“This new edition of *The Armed Forces Officer* articulates the ethical and moral underpinnings at the core of our profession. The special trust and confidence placed in us by the Nation we protect is built upon this foundation. I commend members of our officer corps to embrace the principles of this important book and practice them daily in the performance of your duties. More importantly, I expect you to imbue these values in the next generation of leaders.”

Available at ndupress.ndu.edu/Media/News/Article/1159223/the-armed-forces-officer/

Have you checked out NDU Press online lately?



With 20,000 unique visitors each month, the NDU Press Web site is a great place to find information on new and upcoming articles, occasional papers, books, and other publications.

You can also find us on:



Facebook



Flickr



Twitter



Pinterest

Visit us online at: <https://ndupress.ndu.edu>



JOINT FORCE QUARTERLY

Published for the Chairman of the Joint Chiefs of Staff by National Defense University Press
National Defense University, Washington, DC

