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A Call to the Future

The New Air Force Strategic Framework

Gen Mark A. Welsh III, USAF

America's Airmen are amazing. Even after more than two decades of nonstop combat operations, they continue to rise to every challenge put before them. I wish I could say that things are about to get easier, but I cannot because the dominant trends point to a complex future that will challenge us in new and demanding ways. Adversaries are emerging in all shapes and sizes, and the pace of technological and societal change is increasing—with a corresponding increase in the demand for air, space, and cyber power. In this context, senior Air Force leaders realize we need a single, integrated strategy to focus the way our service organizes, trains, and equips the force to conduct future operations. We need a strategy that points the way forward and does not limit us to an intractable view of the future—one that is actionable, with clear goals and vectors that are implementable, assessable, and revisable. This article describes that strategy: the new Air Force strategic framework for strategy-driven resourcing.

Intellectual Preparation

In a 2014 *Air and Space Power Journal* article, I explained how Airmen contribute to the nation's defense by providing global vigilance, global reach, and global power for America.[1] The article introduced two key documents: *The World's Greatest Air Force: Powered by Airmen, Fueled by Innovation*, and *Global Vigilance, Global Reach, Global Power for America*.[2] For the US Air Force, they represent an aspirational future, assert the enduring importance of airpower, and define our core missions. These key documents represent the beginning of what I expect will be the reinvigoration of Air Force strategic thought for the coming decades.

For the next step in this journey, I want to discuss the Air Force's new strategic framework that will guide us as we move forward. We have recently released two important documents in our strategic document series—*America's Air Force: A Call to the Future*, which is the Air Force's strategic vision, and the *USAF Strategic Master Plan* (*SMP*), which translates that conceptual strategy into comprehensive guidance, goals, and objectives.[3] Together, these documents lead the Strategy, Planning, and Programming Process (SP3) that will arm and empower the Air Force, in collaboration with our partners, to defeat adversaries and defend the nation and our allies in a complex future. Additionally, an upcoming *Air Force Future Operating Concept* will add to the document series by describing how we will operate in the future and how new capabilities will fit together.

America's Air Force: A Call to the Future

> *The Air Force's ability to continue to adapt and respond faster than our potential adversaries is the greatest challenge we face over the next 30 years.*
>
> —*America's Air Force: A Call to the Future* (2014)

A Call to the Future provides the long-term imperatives and vectors for our service to ensure it is able to execute our core missions over the next several decades and is the lead document in our strategic document series. It builds upon "who we are" and "what we do" and provides a path to "where we need to go." That path is strategic in nature and extends beyond the budget horizon to ensure that our Air Force meets the nation's defense needs over the next 30 years. *A Call to the Future* is the natural companion to *The World's Greatest Air Force: Powered by Airmen, Fueled by Innovation* since the two together provide the broad vision of the Air Force.

Strategic Context and Challenge

Understanding that we cannot "see" into the future, four emerging trends provide a strategic context for the strategy. The Air Force will need to win in complex battlespaces characterized by rapidly changing technological breakthroughs, geopolitical instability, a wide range of operating environments, and an increasingly impor-

tant and vulnerable global commons. These trends will shape the operational environment and highlight the broader strategic issues for national defense.

Speed is a common thread between these trends. As *A Call to the Future* states, "We must commit to changing those things that stand between us and our ability to rapidly adapt."[4] Faster adaptation and response—what I call strategic agility—will sustain the Air Force's unique contributions that are critical to the nation. Our challenge is to develop and nurture a future Air Force that will excel in solving national security problems and that is appropriate for the rapid pace of change occurring throughout the world.

The Air Force We Need

A Call to the Future emphasizes two strategic imperatives—agility and inclusiveness—to position the Air Force for success in the coming decades.[5] Agility is the counterweight to the uncertainty of the future and its associated rate of change. More than a slogan, agility is a call for significant, measurable steps to enhance our ability to wield innovative concepts and advanced capabilities in unfamiliar, dynamic situations. By embracing strategic agility, the Air Force will be able to move past the twentieth century's industrial-era processes and paradigms and be ready for the globally connected, information-based world of the coming decades. We will become more agile in the ways we cultivate and educate Airmen and in how we develop and acquire capabilities. Our operational training, employment, organizational structures, and personnel interactions must also become more agile.

Inclusiveness recognizes that "none of us is as smart as all of us." The ability to harness diversity of thought within our Airmen and our partners is the key to developing a truly agile force because it ensures we are leveraging the broadest set of resources to produce the maximum number of options. To do this, we will focus on improving the structure of the Air Force team, evolving our culture to address emerging challenges, and strengthening our connections both external and internal to the service.

Strategic Vectors for the Future

A Call to the Future lays out five strategic vectors along which the Air Force will posture for the future, focus investments, implement institutional changes, and develop employment concepts.[6]

- *Provide effective twenty-first-century deterrence*. The nuclear mission remains the clear priority, and the Air Force will continue to ensure we have the capabilities necessary to sustain a credible ground-based and airborne nuclear deterrent. In addition, the Air Force must pursue a suite of options to deter a wide range of actors.
- *Maintain a robust and flexible global integrated intelligence, surveillance, and reconnaissance (ISR) capability*. To counter growing threats and meet expanding requirements, the Air Force will employ a robust and diverse network of sensors arrayed across the air, space, and cyber domains. ISR will become more timely,

efficient, flexible, and effective; it will also be a robust and survivable force multiplier for operators.

- *Ensure a full-spectrum-capable, high-end-focused force*. The Air Force must focus on capabilities that enable freedom of maneuver and decisive action in highly contested spaces. However, we must retain the skills and capabilities to succeed in conflict across the spectrum of intensity and range of military operations.
- *Pursue a multidomain approach to our five core missions*. Full integration of the air, space, and cyberspace domains is the next leap in the evolution of our service. Future Airmen will intuitively address problems with a multidomain mind-set.
- *Continue the pursuit of game-changing technologies*. The Air Force must maintain a technological edge over our adversaries by shrewdly seeking out, developing, and mastering cutting-edge technologies—wherever and whenever they emerge.

To Organize, Train, and Equip

A Call to the Future does not constitute an *airpower* employment strategy. It is a strategy that transcends multiple domains. The Air Force strategy is also *not* a road map focused solely on next year's budget or a "stay the course" mentality. These matters, important as they may be in the short term, are not critical to the institutional Air Force three decades from now. The strategy is about becoming more agile and adaptive. It is a framework to guide acquisition, science and technology, human capital, and other investments. It is also a broad strategic path for the next 30 years coupled with the recognition of an evolving environment that demands a new approach by the Air Force.

The Plan

The recently released *Strategic Master Plan* describes what we will do to implement the Air Force's strategic imperatives and vectors, making them reality. It translates strategic vision into action by providing authoritative direction for service-wide planning and prioritization. The *SMP* includes four annexes—"Human Capital," "Strategic Posture," "Capabilities," and "Science and Technology"—that provide more specific guidance and direction, further aligning the *SMP*'s goals and objectives to future resource decisions. Certain sections will remain classified to ensure that critical elements of the future force stay linked to the overall strategy. However, most of the *SMP* remains unclassified to ensure wide distribution and unambiguous direction for the Air Force. An ambitious and far-reaching undertaking, the base *SMP* will be updated every two years, with the annexes reviewed annually, to ensure a consistent and relevant connection between today's realities and tomorrow's potential.

Converting Conceptual Strategy into Programmatic Reality

The Strategy, Planning, and Programming Process places strategy at the head of the programming and budgeting process. Without the SP3, the strategy and *SMP* are merely words on paper. It connects the strategic document series to day-to-day operations and is the strategic road map. The process translates strategy into programs and capabilities that are budgeted and funded—and then become reality. This iterative process ensures that strategy and plans serve as the overarching framework for program development in a repeatable manner. It will also provide a unified, understandable, and consistent Air Force message, clearly linked to strategic guidance—one that senior leaders can focus on to provide direction.

The Air Force strategy and the *SMP* provide authoritative guidance to key planners across the Air Staff and major commands. These planners will align their supporting plans with the goals and objectives of the *SMP* as they apply their expertise to inform planning and resourcing. In particular, core function leads will produce core function support plans that further refine resource planning in support of national security and the joint force.[7] Other Air Force flight plans will address issues that are not fully covered by the core function support plans. These flight plans will provide additional guidance and specific direction for crosscutting issues and other functional areas throughout the Air Force. Together, these plans create a constellation of supporting and directive documents to ensure that the strategy becomes reality. The SP3's integration process enables Air Force senior leaders to make critical planning choices based on a comprehensive, unified portfolio of priorities, risks, and capabilities.

In this more robust, strategy-driven environment, commanders and staffs will have proper direction and the necessary authority to reach goals by working discrete but connected actions. The guidance and direction in the *SMP* are designed to enable better enterprise-wide solutions to challenges and close the gaps that can form in execution. Those ideas and concepts that are not linked to SP3 or are not relevant will be easily identifiable; thus, they can be terminated to make room for new ideas and initiatives. The greater Air Force enterprise will remain engaged and current, ready to resource and execute required programs to make progress on our strategic goals. Previously disconnected, these actions maintain vertical and lateral links across the force—epitomizing the balance of centralized control with decentralized execution.

A Concept of Operations for the Future

This summer, we plan to release a new *Air Force Future Operating Concept* that will further inform strategic planning by describing how Airmen will operate the capabilities wielded by the future Air Force and how those capabilities will fit together. A natural companion for *A Call to the Future*, this document will provide an innovative portrayal of how an agile, multidomain Air Force will operate in 20 years' time. It will describe future capabilities in broad terms and how these capabilities will fit into the future environment. The concept will depict a desired future Air Force that is the product of two decades of successful evolution in strategy-

informed planning and resourcing; furthermore, it will serve as a baseline for continued concept development, experimentation, and refinement.

Whether you are an Air Force leader, joint operator, government partner, or trusted ally, the *Future Operating Concept* will help articulate what role Airmen will assume in the future defense of the United States. It will frame the strategic picture of the Air Force and coalesce the imperatives, vectors, and goals present in *A Call to the Future* and instituted by the *SMP*.

A Call to Action

Because strategy is not prescient, it must be adaptive as it seeks to balance the present with the future. Some key decisions that will have lasting effects long into the future must be made now. We will make those decisions by connecting new concepts and plans to the strategic framework. To the operator in the field, it may be difficult to find your direct connection to the entire SP3 process—such a long-range strategy may seem divorced from today's reality. However, you are connected—our future will be built on your skills, experience, and insights. I am confident in you, and I trust your judgment. We will continue to organize, train, and equip you to win today's fights while we evolve to confront tomorrow's challenges. That is why we have created a broad strategic framework, which includes mission, vision, and strategic context, to answer our nation's call.

To all readers, I leave you with closing thoughts from *The World's Greatest Air Force: Powered by Airmen, Fueled by Innovation*: "The United States Air Force is a remarkable success story! Our history may be short, but our heritage is legendary. We truly stand on the shoulders of heroes. Those heroes expect us to make this Air Force even better. To do that, each of us must find new ways to win the fight, strengthen the team, and shape the future. Every Airman, every day, can make a difference—be that Airman!"[8] ✪

Notes

1. Gen Mark A. Welsh III, "Global Vigilance, Global Reach, Global Power for America," *Air and Space Power Journal* 28, no. 2 (March–April 2014): 4–10, http://www.airpower.maxwell.af.mil/digital/pdf/articles/2014-Mar-Apr/SLP-Welsh.pdf.
2. Headquarters US Air Force, *The World's Greatest Air Force: Powered by Airmen, Fueled by Innovation—A Vision for the United States Air Force* ([Washington, DC: Headquarters US Air Force, n.d.]), http://www.osi.af.mil/shared/media/document/AFD-130111-016.pdf; and Headquarters US Air Force, *Global Vigilance, Global Reach, Global Power for America* (Washington, DC: Headquarters US Air Force, n.d), http://www.af.mil/Portals/1/images/airpower/GV_GR_GP_300DPI.pdf.
3. Headquarters US Air Force, *America's Air Force: A Call to the Future* (Washington, DC: Headquarters US Air Force, July 2014), http://airman.dodlive.mil/files/2014/07/AF_30_Year_Strategy_2.pdf; and Headquarters US Air Force, *USAF Strategic Master Plan* (Washington, DC: Headquarters US Air Force, forthcoming).
4. Headquarters US Air Force, *Call to the Future*, 8.
5. Ibid., 9–13.
6. Ibid., 14–19.

7. Core functions refer to the Air Force's 12 service core functions: agile combat support, air superiority, building partnerships, command and control, cyberspace superiority, global integrated ISR, global precision attack, nuclear deterrence operations, personnel recovery, rapid global mobility, space superiority, and special operations. Core function leads are major commands designated to lead each of the core functions, a fact captured in core function support plans.

8. Headquarters US Air Force, *World's Greatest Air Force*, [4].

Gen Mark A. Welsh III, USAF

General Welsh (USAFA; MS, Webster University) is chief of staff of the US Air Force, Washington, DC. As chief, he serves as the senior uniformed Air Force officer responsible for the organization, training, and equipping of 690,000 active duty, Guard, Reserve, and civilian forces serving in the United States and overseas. As a member of the Joint Chiefs of Staff, the general and other service chiefs function as military advisers to the secretary of defense, National Security Council, and president. General Welsh is a graduate of Squadron Officer School, Air Command and Staff College, Army Command and General Staff College, Air War College, and National War College.

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De Plein Fouet: Is Strategy Dead?

Robert Cardillo
Richard Szafranski

Robert Cardillo (RC): We're going to discuss strategy. Judging by the title you chose, I assume you have a point of view.

Richard Szafranski (RS): Yes, sir. *Le tir de plein fouet* is one of the forms of artillery fire—direct fire—described by Lieutenant Gondry in the 1918 *French and English Artillery Technical Vocabulary* for "the use of French Artillery Instructors in the U.S. Army."[1] Let's fire directly at the idea of strategy.

The hypothesis is that strategy is dead, and that's the point of view I'll take. Specifically, the word has become meaningless in the diffusion of its use; the notion causes dilution of organizational effectiveness when any entity subordinate to the corporate parent asserts a strategy; and a much simpler framework is evident in

successful organizations, thus supplanting the idea of *strategy*. We'll discuss that simpler framework later.

Search on *strategy*, and the pointlessness of the word is quickly evident. There are dating strategies, lawn-care and pest-control strategies, child-rearing strategies, and strategies for every lofty and mundane human endeavor. Hundreds of millions of dollars—maybe billions—are spent annually on crafting visions and strategies as well as creating or updating strategic plans worldwide. Publicly traded corporate entities must have a corporate strategy to satisfy the oversight requirements of their board, and government entities have strategies "because." In government a subordinate-entity strategy is analogous to the battalion-company-platoon each having a strategy.

I suspect you may disagree since you lead and manage a large, complex global intelligence agency—the National Geospatial-Intelligence Agency (NGA)—with, according to the press, 9 or 10 legions of people and a multibillion-dollar budget. Doubtless, as is the practice, you have or you have inherited "a strategy."

RC: Suspicions confirmed. Even before I became the director in October 2014—during the transition period—I reaffirmed the NGA vision and the NGA strategy for 2013–17. Published in 2012, the NGA strategy aligns with the nation's strategic priorities, goals, and objectives as outlined in the *National Intelligence Strategy*, the *Defense Intelligence Strategy*, and the secretary of defense's strategic guidance—*Sustaining U.S. Global Leadership: Priorities for 21st Century Defense.* Our strategy specifies two strategic goals and seven strategic objectives. An unclassified version is on our public website. [2] I affirmed the vision and strategy for at least four reasons.

First, and above all else, tinkering with the vision initiates a chain of activities that sets everyone's hair on fire. The vision we have is good enough. We all have to make choices about how we spend finite time resources, so I choose not to spend time debating a fundamental statement. I prefer to use that time on implementation—how we will act within that strategic framework. Second, it would have been plain wrong to reject thousands of hours of thoughtful effort to tweak the strategy here or there. Third, I can't agree with your battalion-company-platoon analogy. Our strategy interprets and translates the guidance of our corporate parents within the context of the domain we command—the around-the-clock, moment-by-moment creation of geospatial and geotemporal intelligence to make our customers successful. My subordinate elements do not have separate strategies, but they do indeed have various approaches to achieve the strategy—some helpful, some not. Fourth, change is a constant. In February 2015, the president issued a new *National Security Strategy*.[3] Consequently, changes will be forthcoming to the *National Intelligence Strategy*, the *Defense Intelligence Strategy*, and the secretary of defense's strategic guidance. The NGA has to be aligned with all of those, so while the word *strategy* may be misused in some quarters, neither strategic thinking nor strategy is dead in the NGA.

RS: I'm not sure that what you're describing, sir, is a strategy as much as it is the "implementation plan"—the translation and interpretation, as you said, for the "guidance" that comes from the defense and intelligence hierarchy beneath the president. Isn't what you described really an implementation plan?

RC: Yes, exactly. All too often people equate the strategy with the result. To the contrary, the conversations that are required to land on a strategy can (and should) be a very beneficial exchange of views of the current state of the business and,

more importantly, where the business needs to go. The NGA is a large, complex outfit with a highly sophisticated mission that drives everything. We exist for one reason—to serve global customers whose operations don't allow for error. Our adversaries are agile and attempt to operate outside our sights. We have an integrated workforce that includes specialties and disciplines that others don't have. We use words like *geodesy* in sentences that make sense, for example. Consequently, although our strategy does help ensure that we implement the guidance we get from those above us, it also has unique and nonimitative components regarding our globally distributed workforce, our workplaces, and the way we will acquire, sustain, and modernize.

Should I be interpreting what you're suggesting as that there should be only a national security strategy and that everything cascading from that strategy is an implementation plan?

RS: If I were suggesting that, how would you respond?

RC: Right now, I would politely reject it. To move from national strategy to agency implementation is a bridge too far. By definition, everything and everyone on our national security team fits inside that umbrella document. Even though it's useful (and necessary) to ground our efforts in that document, it is insufficient to focus us on our discriminate value proposition. All large, complex organizations have to attend to matters of organizational maintenance and hygiene that must be thought of strategically—matters that no one else can think about. To me, that's a part of our strategy. My friend Gen Mark Welsh has an Air Force strategy that looks 30 years into the future.[4] It's difficult for me to envisage how one would focus 140,000 people on singular objectives without a strategy that aligns them. I visited the National Air and Space Intelligence Center (NASIC) in Dayton, Ohio, recently. Like the NGA, the NASIC is in the intelligence business. It gets the same guidance or strategy that all of us in intelligence receive; additionally, it supports the Air Force strategy. The NASIC requires its own corporate process to help implement the Air Force strategy and—through its boards, panels, and councils—to act strategically.[5] If your point is that one needn't have a formal, published strategy at every level of the organization to act strategically, then we agree.

RS: That was one point. Another comes from looking at wildly successful start-ups in Silicon Valley and elsewhere. I imagine that their "strategy" is something like "develop a really cool app and get acquired or go public."

RC: I imagine the same. I would also think from the outset that the start-ups have a laser-like focus on their discriminate value. In other words, they seek separation so as to show their unique business and customer value. I would argue that separation in the intelligence business is a dangerous proposition. Rather, the NGA seeks to convey contextualized content in a way that makes our partners in the intelligence community more valuable to our customers—which I prefer to call their consequence. Thus, the need for a strategy is a matter of scale, scope, standards, and sustainability. Three people in a garage working on the instantiation of a brilliant idea may not need a strategy beyond the one we both imagine. The NGA—the elegant integration of its predecessor organizations with the addition of some important new things—has been around a long time. Scale: we're large. Scope: we're everywhere. Standards: we're accountable to the American people, our overseers, our

customers, our partners, and our Team NGA. Sustainability: we're not going to be acquired or go away. We'll be around for a long time. Like General Welsh, I'm obligated to have the long-range optics which ensure that our enterprise can sustain and enhance the value we provide customers over the long, long term. So I don't think I'm persuaded that NGA doesn't—or organizations like ours don't—need a strategy.

RS: Then let me try another angle—millennials. According to the Bureau of Labor Statistics, millennials will comprise 75 percent of the workforce by 2030.[6] Few studies suggest that they're a homogeneous group, yet a number of studies cite similar attributes. Millennials are the most well educated generation in American history; they are unrealistic in their expectations for the workplace, including a desire for bosses who are friendly; and they disdain red tape and processes they consider superfluous.[7] Some data suggest that retaining them in an organization will be difficult; they'll come and go. How confident are you that the millennial generation will take the same view of the importance of strategy that you take?

RC: I agree with you that millennials have a particular worldview and their own set of expectations as they build their careers. Further, I would say that what's not changed is that everyone (and I mean everyone) has a certain demand, almost Maslowian, for a basic compact with any career—who are we, and how do I fit? To me, strategy is part of the answer to "Who are we?" The implementation of that strategy answers the question "How do I fit?"

As we attend to professional development, we should be educating the entire workforce on the value of planning, careful execution, performance metrics—all of the things that relate to maintaining standards and promoting sustainability for organizations of tremendous scale and a large scope of responsibilities. That said, I can't predict the future. Perhaps those who take our places will find some substitute for strategy, or maybe the Internet-of-Things will allow everything to become automatically self-correcting like a self-driving car. I don't see that coming, or coming very soon, though. Remember, we exist because we support people in harm's way and because the people capable of doing that harm—active, creative, and rarely perfectly predictable—are very cunning and inventive. It takes people to understand people.

RS: I wanted to fire at the notion of strategy—first, because the meaning of the word has been so polluted that it needs a good scrubbing, if only for millennial successors; second, because every layer in a hierarchy doesn't need a strategy to support the next higher layer; and third, because there may be a simpler way to think about strategy.

RC: What way would that be?

RS: Bear with me, please. As I reflect on what I know or have seen in great, successful organizations and those not so great, the outstanding ones have common attributes. Take the religious movements and their many adherents. It's difficult for me to believe that their founders had any notion of strategy. Yet these movements successfully became both global and durable.

RC: I believe that may be an unfair comparison. I am neither a religious scholar nor a historian, but the theological issues and influences associated with a religion

or a religious movement are far more involved. Do you have a better comparison you'd like to make?

RS: Yes, the common attributes of winners. The common attributes I've observed are world-changing objectives, inspirational leadership, a keen sense of priorities, and the ability to apply the right resources at the right time.

World-changing objectives are the big and audacious goals that are socially valuable and transformational because they stretch the organization to grow its contributions and its value to customers. Inspirational leadership is the kind of optimistic, never-flagging leadership that summons everyone's very best in moving as a team toward meeting those world-changing goals. A keen sense of priorities is the ability to use the goals as a touchstone and a filter to discern both what the organization needs to do and what it needs to stop doing or start doing in a dramatically different way. Finally, a winning organization manifests the ability to apply the right resources at the right time to secure the momentum and the forward movement by allocating and reallocating time, money, people, and energy consistently, even as the resource stream changes. If an organization has all of those, why would it need "a strategy"?

RC: I see that as a false choice. Let me rephrase the question or answer a different question. What if the question were, "If the inspired leaders of a large, complex organization had—and used—a strategy for changing the world by applying the right resources to the right priorities at the right time, would they be more or less likely to succeed and endure?" My answer is that they would be more likely to succeed and to continue to contribute than an organization without a strategy.

I don't know if I've persuaded you, and I thank you for helping me talk through this and conclude that strategy or the notion of strategy is not dead. Are we in the same place?

RS: We are, and thank you. Should we change the title to "*Ricochet*: Is Strategy Dead? Not"?

RC: Let's leave it as is. It's a catchy title, and *Journal* readers are smart enough to decide for themselves. ✪

Notes

1. Lieutenant Gondry, *French and English Artillery Technical Vocabulary* (Paris: Henri Charles-Lavauzelle, 1918), https://archive.org/details/frenchenglishart00gondrich.

2. National Geospatial-Intelligence Agency, *NGA Strategy, 2013–2017* (Springfield, VA: National Geospatial-Intelligence Agency, May 2012), https://www.nga.mil/about/NGAStrategy/Pages/default.aspx. See also Office of the Director of National Intelligence, *The National Intelligence Strategy of the United States of America, 2014* (Washington, DC: Office of the Director of National Intelligence, 2014), http://www.dni.gov/files/documents/2014_NIS_Publication.pdf; Office of the Secretary of Defense, *Defense Intelligence Strategy* (Washington, DC: Office of the Secretary of Defense, 2008), https://www.hsdl.org/?view&did=486157; and Department of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: Department of Defense, 2012), http://www.defense.gov/news/Defense_Strategic_Guidance.pdf.

3. President of the United States, *National Security Strategy* (Washington, DC: White House, February 2015), http://www.whitehouse.gov/sites/default/files/docs/2015_national_security_strategy.pdf. See

also Tanya Somanader, "President Obama's National Security Strategy in 2015: Strong and Sustainable American Leadership," *White House Blog*, 6 February 2015, http://www.whitehouse.gov/blog/2015/02/06/president-obamas-national-security-strategy-2015-strong-and-sustainable-american-lea.

4. Headquarters US Air Force, *America's Air Force: A Call to the Future* (Washington, DC: Headquarters US Air Force, July 2014), http://airman.dodlive.mil/files/2014/07/AF_30_Year_Strategy_2.pdf.

5. National Air and Space Intelligence Center Instruction 90-103, *NASIC Corporate Process*, 15 May 2014, http://static.e-publishing.af.mil/production/1/nasic/publication/nasici90-103/nasici90-103.pdf.

6. Alastair Mitchell, "The Rise of the Millennial Workforce," *Wired*, 15 August 2013, http://www.wired.com/2013/08/the-rise-of-the-millennial-workforce/.

7. Shama Hyder, "Study Reveals Surprising Facts about Millennials in the Workplace," *Forbes*, 5 December 2013, http://www.forbes.com/sites/shamahyder/2013/12/05/study-reveals-surprising-facts-about-millennials-in-the-workplace/; and Jacquelyn Smith, "8 Things You Need to Know about Millennials at Work," *Business Insider*, 18 November 2014, http://www.businessinsider.com/what -you-should-know-about-millennials-at-work-2014-11.

7. Shama Hyder, "Study Reveals Surprising Facts about Millennials in the Workplace," *Forbes*, 5 December 2013, http://www.forbes.com/sites/shamahyder/2013/12/05/study-reveals-surprising-facts-about-millennials-in-the-workplace/; and Jacquelyn Smith, "8 Things You Need to Know about Millennials at Work," *Business Insider*, 18 November 2014, http://www.businessinsider.com/what -you-should-know-about-millennials-at-work-2014-11.

Robert Cardillo

Mr. Cardillo (BA, Cornell University; MA, Georgetown University) became the sixth director of the National Geospatial-Intelligence Agency (NGA) on 3 October 2014. He leads and directs the NGA under the authorities of the secretary of defense and director of national intelligence. He previously served as the first deputy director for intelligence integration, Office of the Director of National Intelligence; deputy director of the Defense Intelligence Agency (DIA); and deputy director of analysis, DIA. He also served as the acting J2, a first for a civilian, in support of the chairman of the Joint Chiefs of Staff. Mr. Cardillo is the recipient of the Director of National Intelligence Distinguished Service Medal, the Presidential Rank of Distinguished Executive, the Presidential Rank of Meritorious Executive, and the Chairman of the Joint Chiefs of Staff Joint Meritorious Civilian Service Award.

Richard Szafranski

Mr. Szafranski (BA, Florida State University; MA, Central Michigan University) is a private adviser to the chief executives of new ventures and serves as an independent trustee on the board of trustees for Corporate Office Properties Trust. He was formerly the managing partner and senior fellow in a consulting firm from 1996 until retiring in 2012. An experienced leader, executive, and independent corporate director for publicly traded corporations, he served in various capacities for SBS Technologies, an embedded computer company, and for the Ceridian Corporation, a business services and benefits company. Mr. Szafranski has completed executive education at the Harvard Business School, the University of Maryland's Robert H. Smith Director's Institute, and the Wharton School of the University of Pennsylvania. In 2013 he was designated a Board Leadership Fellow by the National Association of Corporate Directors for his proven continuous commitment to excellence in corporate governance. Mr. Szafranski serves as a reviewer for the *Air and Space Power Journal*.

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Untethered Operations

Rapid Mobility and Forward Basing Are Keys to Airpower's Success in the Antiaccess/Area-Denial Environment

Maj Gen Charles Q. Brown, Jr., USAF
Brig Gen Bradley D. Spacy, USAF
Capt Charles G. Glover III, USAF

An operation incorporating "untethered" sortie generation can unleash the asymmetric advantage of US, allied, and coalition airpower. The unmatched flexibility and capacity of alliance and coalition C2, mobility, and logistic strengths can bring together the right aircraft, weapons, fuel, maintenance, and Airmen at the right place and time to create the combat power needed to win.

—Gen Frank Gorenc
Commander, USAFE-AFAFRICA

A lone C-17 landed smoothly in the predawn hours at Ämari Air Base, Estonia. The C-17 was from the Heavy Airlift Wing in Pápa, Hungary. Ämari had yet to experience the devastation of a Russian air attack. The sheer number of NATO basing options made targeting all of them impossible and had so far kept Ämari safe.

The cargo ramp was already lowering as the C-17 taxied to a stop and USAF Airmen piled out. The seemingly deserted base came alive as Airmen began organizing the ramp. There were aircraft maintainers, operations and intelligence personnel, and a squad of security forces. They went to work immediately, unlocking and organizing munitions, connecting fuel lines to hydrants, and setting up expeditionary defensive fighting positions. The operations and intelligence personnel set up a deployed ops center.

In less than an hour, four Dutch F-16s entered the traffic pattern and landed quickly. Like the C-17, the fighters had barely come to a stop before Airmen clambered over them, helping the pilots unstrap and egress. The aircrews were hustled to the waiting intelligence officers while the aircraft were reloaded with bombs and fuel. The operations update and intel briefings would last just as long as it took the Airmen to rearm and refuel the jets. They would then depart on their next combat mission—their third of the night.

In less than two hours, the F-16s were gone, and the C-17 was taxiing for takeoff. The next base was Łask in Poland where a flight of US F-16s was scheduled to join them. The C-17 could do this three more times before it had to return to Ramstein and refit. NATO forces were repeating this scene all over Eastern Europe. The war is going well; Russia simply doesn't have the capacity to fight across such a broad front.

This scenario is fictional, but it depicts the high end of a new concept called untethered operations (UTO), which leverages robust basing and North Atlantic Treaty Organization (NATO)/partner interoperability to complicate Russian targeting and create an arsenal of options for allied combat operations in Europe. The Russian annexation of Crimea in 2014 and continued aggression toward Ukraine provide both insight into Russia's intentions and a grim reminder of its lethal potential to accomplish its goals. As Russia reasserts itself in Eastern Europe and NATO gears up to respond rapidly, UTOs offer a glimpse of the future for allied air forces in the European antiaccess/area-denial (A2/AD) environment.

Antiaccess / Area Denial

Simply put, "*anti-access* (A2) challenges prevent or degrade the ability to enter an operational area. . . . *Area denial* (AD) refers to threats to forces within the operational area" (italics in original).[1] Although opposing forces throughout history have tried to deny each other freedom of movement around the battlefield, during recent conflicts in Iraq and Afghanistan, these actions occurred mostly at the tactical level. However, "just as Blitzkrieg changed combat in 1940, anti-access/area denial technologies and strategies have re-defined the character of modern warfare."[2] In this new environment, sophisticated adversaries will use asymmetric capabilities—including electronic and cyber warfare, ballistic and cruise missiles, advanced air defenses, mining, and other methods—to complicate our operational calculus.[3] US strategic guidance has been clear in noting that despite the challenges of operating in the

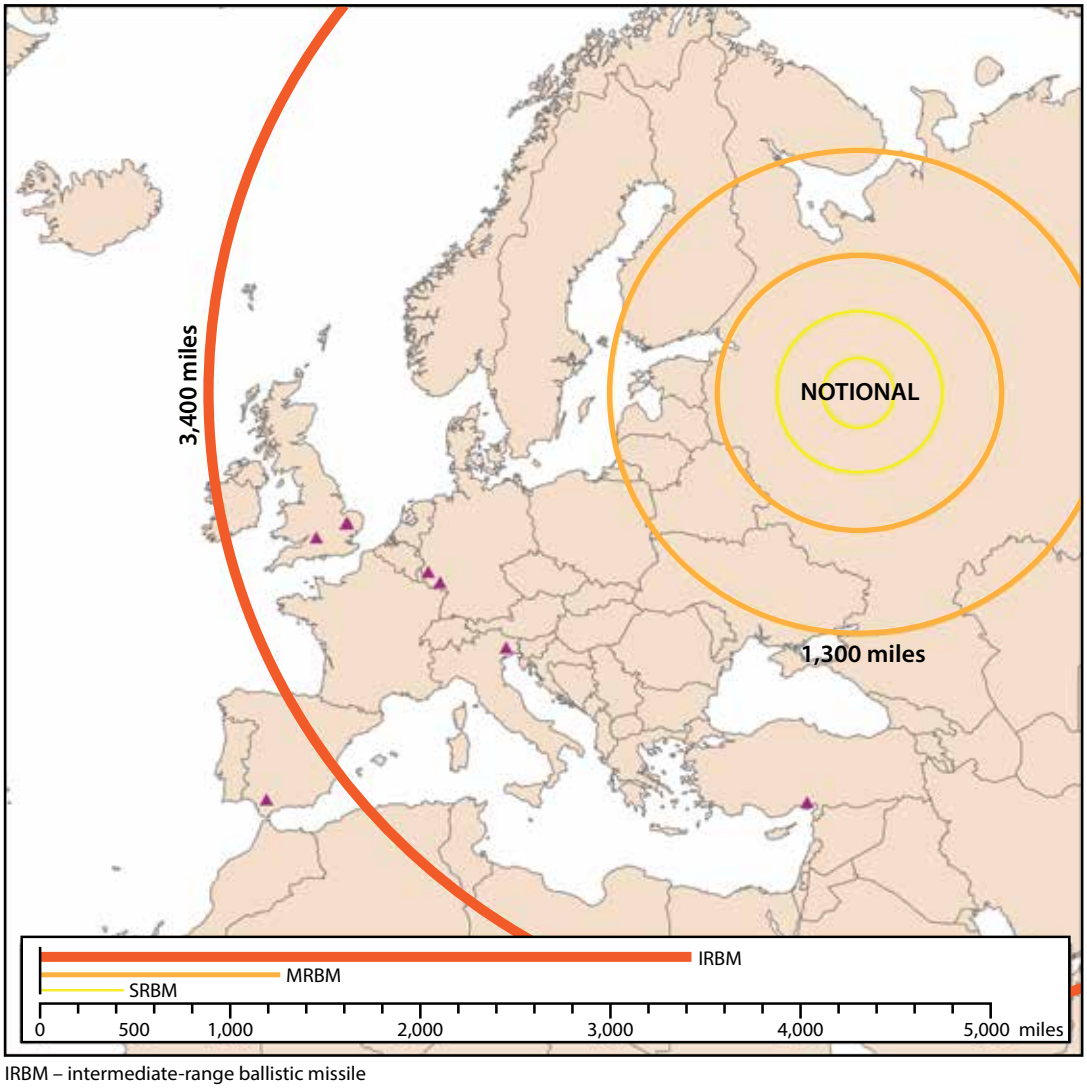
A2/AD environment, US forces must continue to project power to credibly deter potential adversaries and prevent them from attaining their objectives.[4]

Recent discussions of A2/AD have mostly focused on the Western Pacific theater of operations; however, Russia's aggression in Ukraine makes it clear that European security and the international rules and norms against territorial aggression cannot be taken for granted.[5] Given this backdrop, Russian A2/AD capabilities pose new issues for US and NATO/partner air forces.

Russian Threat

Russia's latest doctrinal revision lists NATO as its top national security threat. Russia's defense budget already accounts for 20 percent of all public spending, and it plans to spend an additional 20 trillion rubles (364 billion US dollars) on defense over the next five years. Eighty percent of those funds are targeted toward high-tech nuclear, space, reconnaissance, and communications weapons.[6] Adding quality to quantity, Russia's State Armament Plan calls for modernizing 70 percent of the armed forces by 2020, including upgrades to procurement and development, expansion of surface-to-air missiles and ballistic missiles, and at least 150 new airplanes and helicopters.[7] Advanced standoff weapons like Russia's pose major threats to US and allied air force operations, especially as that country increases the sophistication of its integrated air defense and invests in ballistic missile systems. Intermediate-range missiles that can travel between 300 and 3,400 miles could allow Russia to reach many NATO countries (see figure on the next page).[8]

Russian ballistic and cruise missiles with ranges far greater than 1,000 miles and accuracy measured in tens of meters reduce the options available for allied air forces, including (1) operating from greater distances, (2) dispersing operations to a larger number of bases, or (3) to the extent possible, increasing the defenses of all bases.[9] Most US main operating bases (MOB) are within 1,500 miles of Russia—too close to count on distance as a defense. Similarly, hardening these bases to withstand a determined attack by advanced weaponry has historically proven costly in terms of construction and maintenance, leaving the option of dispersing operations and decreasing dependency on MOBs.[10] European geography and the numerous NATO / partner nations offer unique opportunities to disperse operations by building on traditional forward arming and refueling point (FARP) concepts.



IRBM – intermediate-range ballistic missile
MRBM – medium-range ballistic missile
SRBM – short-range ballistic missile

Figure. US Air Forces in Europe main operating bases within footprint of notional intermediate-range ballistic missiles

Forward Arming and Refueling Point

The Department of Defense defines FARP as "a temporary facility, organized, equipped, and deployed to provide fuel and ammunition necessary for the employment of aviation maneuver units in combat."[11] According to Maj S. E. Mills, USMC,

> The advantages of forward aircraft basing have been recognized for almost as long as military aviation has existed. Hans Rudel, the most feared German Stuka pilot of WWII, relied on forward bases that had been cached with fuel and ammunition which allowed him to maneuver his aircraft wing along the entire Eastern Front. . . . The ability to resupply his aircraft virtually anywhere along the front gave Rudel the logistical support required for him to extend aviation's influence over a vast area. He was able to plug holes created by penetrating Russian armor forces located long distances away from his organic support base. Rudel could also strike deep to interdict reinforcing enemy units. The Germans had learned early that when logistically sustained near the target area, aviation was, more often than not, the decisive element in the outcome of a battle.[12]

FARP in the Air Force emerged from lessons learned in 1980 during Operation Eagle Claw, the attempt to rescue hostages held in Iran. During the operation, Air Forces planners realized they needed an efficient way to transfer fuel from aircraft to aircraft—helicopters in this case—in a hostile environment. The resulting use of FARP operations expanded the role of special operations forces around the world by providing a means to "hot" refuel (i.e., while the engine is running) from tanker aircraft to various types of fixed- and rotary-wing platforms.[13] Since then, US and NATO air forces have implemented elements of FARP through NATO cross-serving exercises designed to support the regeneration of combat aircraft should they divert to a NATO air base other than their home station.[14] The idea of conducting FARP operations to support fighter aircraft (fighter FARP) was revived in Pacific Air Forces' (PACAF) recently developed Rapid Raptor concept of operations.[15]

Rapid Raptor—Fighter FARP in Pacific Air Forces

Designed to operate aircraft in an A2/AD environment, Rapid Raptor uses the innovative concept known as fighter FARP, which combines sortie-generation capabilities and mobility support to enable more expeditionary and dispersed operations. It makes use of existing airfields throughout an area of responsibility to increase the range and tempo of fighter operations.[16] Conceived in 2008 by two pilots who were trying to figure out how to use a C-17 to deploy F-22s to any base that needed them, Rapid Raptor seeks to operate fighter aircraft in PACAF's contested environment and project combat power against China.[17] The concept calls for deploying fighters and employing a single C-17 to move all of the support required to refuel, rearm, and maintain the aircraft in an austere environment.[18] PACAF exercises Rapid Raptor annually, deploying from Joint Base Elmendorf–Richardson, Alaska, the most recent exercise having taken place at Andersen AFB, Guam. Although Rapid Raptor's goal was to load everything into a single C-17, the deploying unit had to borrow selected aircraft-generation equipment and material-handling equipment from the exercise location.[19] However, everything F-22 specific was transported via the single C-17 to the deployed location, including 36 support personnel for maintenance, munitions, weapons, and fuel.[20] Rapid Raptor demonstrated the potential value of fighter FARP and limited logistics support in the Western Pacific theater of operations.

Untethered Operations

The UTO operational concept depends upon light logistics and forward basing to offer increased agility to fighter operations in the A2/AD environment. It seeks to reduce or even eliminate the need to "tether" fighter aircraft to MOBs. In Europe, UTOs combine the benefits of the geographical distribution of European air bases, traditional FARP, and the fighter FARP exercised during PACAF's Rapid Raptor.[21]

Like Rapid Raptor, UTOs begin with the baseline requirement to fit all fighter-support needs into a single C-17; however, unlike Rapid Raptor, UTOs are not weapons-system specific. The basic package is designed to support four fighter aircraft in the most austere environment. The single C-17 template forces load planners to prioritize support demands to keep the logistics tail as lean as possible, thus increasing agility, reducing coordination requirements, but placing limits on the number and types of missions supported.

Producing fighter sorties from an austere location is largely a matter of logistics. Whether operating from a MOB or a forward operating location (FOL), fighters must have a runway, fuel, munitions, support equipment, spare parts, and the personnel to operate them. The logistics equation is basic: the more munitions and support equipment that can be stored at the forward location, the less the need to transport that materiel and the more flexible the options become. If enough support is pre-positioned, then the logistics load can be reduced to the point that a single C-17 (or even a C-130) load can support fighter operations almost indefinitely. Adding forward fuel storage to the capabilities virtually eliminates the need to refuel from transport aircraft; support aircraft could then hop from base to base, helping with multiple fighter packages each day. Selected FOLs could also be used as logistics "mini-hubs," and transport aircraft could remain overnight, refitting without returning to a MOB. Fighters could even recover at a mini-hub to make minor repairs or conduct periodic inspections. As FOLs mature, bases could be categorized by the level of support available. For example, at a level-one base, having nothing more than a suitable runway, aircraft would have to deliver all logistics, thereby significantly limiting the number and types of combat sorties available. A level-five base, however, might have munitions, fuel, and all material-handling equipment pre-positioned, resembling the base described in the fictitious scenario at the beginning of this article. It would take a fully loaded C-17 to support limited combat operations at a level-one base, but a minimally loaded C-17 could hop from one level-five base to another, supporting multiple combat sorties. Such a prospect is no longer purely theoretical but is rapidly becoming reality.

Forward basing is essential to the UTO concept. UTOs in Europe capitalize on US and NATO / partner nations to increase basing options dramatically and reduce logistics demands. Detailed site surveys already have been conducted at about 100 NATO/partner bases in US Air Forces in Europe (USAFE), and more than 400 bases in Europe are capable of supporting fighter operations.[22] A number of these bases are routinely used by allied forces, and many more are becoming available. By identifying minimal mission requirements for flight operations and selectively improving facilities throughout the theater, USAFE and NATO installation planners are rapidly increasing basing options. Some of the improvements to NATO/partner air-

fields include runways, munitions storage, fuel storage, and warehousing. Each of these enhancements directly supports flight operations and/or frees valuable pallet positions on transport aircraft, thus adding to the options for mission planners.

Developing NATO bases is a strategic plan with some tactical opportunities. Strategically, planners take advantage of US and NATO funding to devise long-term improvements. The NATO Security Investment Program offers approximately 800 million euros annually to the 28 member nations to spend on essential facilities and certain equipment within specific capability packages. Projects funded through that program are usually planned and executed in 5 to 20 years. The tactical aspect is offered by funding recently approved under the European Reassurance Initiative, which has enabled USAFE planners to accelerate the development of bases throughout the theater and has helped mature UTO capabilities.

USAFE logisticians also utilize the UTO factor of European geography to decrease airlift requirements. Unlike the Western Pacific theater of operations, Europe is a small area of responsibility well connected by a seasoned network of roads. Even the most austere bases have roads capable of supporting ground-resupply convoys, thus presenting mission planners with even more options. In a bare-base scenario as described in the level-one example, a single C-17 might carry the support load needed to launch initial combat sorties. Regardless of munitions expended or fuel consumed, it would still have to return to a MOB to refit after a relatively short time. Because most allied bases in Europe are only two to three days' ground travel apart, the option of resupply by convoy essentially eliminates the need to return to a MOB. In this scenario, fighter aircraft could continue to fly for weeks or even months before returning to a MOB. As UTOs in the theater develop, an unlimited number of possible basing scenarios will emerge.

The interoperability within NATO / partner nations offers yet another unique opportunity to further expand UTOs and reduce the logistics tail for allied planners. US and NATO / partner nations have long-standing relationships among their air forces and have historically leveraged each other's support. As mentioned above, NATO cross-servicing exercises designed to enable mutual support to fighter aircraft among allied nations were conducted in the Cold War and as recently as 2010.[23] Such exercises not only resemble a basic FARP operation but also offer an example of how interoperability can enhance capability. The next step is to identify the specific skill sets that enable NATO / partner nation forces to support combat-sortie generation and deliberately create training events through programs in building partnership capacity (BPC).

BPC training is not limited to skills directly tied to flight operations; rather, it includes other necessary support functions such as crash-fire rescue, security forces, and aerial port operations. Improved interoperability across the spectrum of flight operations and agile combat support functions both reduces the logistics problem for allied planners and enables countries with few or even no modern fighters to participate in defense efforts. This participation goes a long way toward solidifying relationships and gaining key participation in allied operations. With robust BPC efforts, one can easily foresee a time in the not-too-distant future when US aircraft could be fully serviced and launched by allied forces without US support.

Operations

Robust basing options and interoperability with NATO / partner nations create numerous operational ways of employing airpower in Europe. Airfield and pre-positioning improvements already in the works by USAFE and NATO planners are force multipliers in an A2/AD environment. As the threat evolves to deny access, the combined force air component commander (CFACC) can rapidly adjust to the environment, matching regeneration capabilities (pre-positioned, airlifted, or ground transported) at various locations with combat aircraft requiring refueling and rearming.

Reviving a NATO cross-servicing mind-set and BPC regime that maximizes the capabilities of our NATO allies / partner nations will facilitate execution of a scenario similar to the one described at the beginning of this article. Conceptually, during UTO execution the CFACC would maintain a living playbook of air base capabilities and capacity to expedite near-real-time decisions that shift regeneration capabilities and subsequently direct combat aircraft to the appropriate air base for refueling and rearming. Similar to targeting methodology during the development and execution of an air tasking order, UTOs could be deliberately planned and included in that order, directing the airlift of required regeneration capabilities and projected FARP timing at specific air bases. The deliberate planning capacity and tempo would take into account the air base categorization construct—level one (austere) to level five (robust). The higher the level, the greater the capacity and/or increased tempo the CFACC can expect in planning and execution. Should the threat environment change and/or regeneration capability fall below the minimums required, UTO regeneration capabilities and execution could be dynamically retasked to a more suitable air base.

Opportunities

UTOs are not constrained to an A2/AD environment. They can be applied across a spectrum of environments and scenarios both in and out of the European theater. Following the Wales Summit in September 2014, NATO began establishing a Very High Readiness Joint Task Force of a land component with appropriate air, maritime, and special operations components that will rapidly respond in a NATO contingency.[24] Considering the responsiveness needed, the UTO concept will be foundational to air component planning and execution as part of the task force. The limited capabilities and vast distances in Africa provide more opportunities to apply UTOs. Africa Command and its components are developing a hub-and-spoke concept of operations whereby forces would deploy to a MOB hub and then "spoke" to less-capable airfields for short-duration operations—a scenario for which UTOs have applicability.

These operations also present opportunities for functions across the agile combat support portfolio to rethink the delivery of capabilities. New strategies for the storage and distribution of war reserve materiel (WRM) could include the purchase of selected WRM for pre-positioning or possibly redistributing existing WRM assets by pre-positioning them at FOLs. Combat skills training for all Airmen should also be

reevaluated and perhaps expanded beyond current projected levels. Proficiency in basic "shoot, move, communicate" skills can reduce the necessity of security forces by enabling all Airmen to participate in FOL defense. Since an order to support UTOs can occur with little notice, Airmen should routinely practice their combat skills. Furthermore, at an austere location in the A2/AD environment, every Airman should have an assigned "battle station" in the event of a ground attack. These "fight-the-base" concepts have been developed and fielded in the past and could be revived. Unit type code packages might also need tailoring. As with combat skills, aircraft maintenance personnel should be cross-trained to the maximum extent possible, further reducing the demand for "boots on the ground." Moreover, most of the modern airfield damage repair capability is currently targeted for the Pacific theater. Given the urgency of the resurgent Russian threat, additional repair kits should be purchased and allocated to the European theater. As resources become available, these kits should eventually be pre-positioned along with WRM at FOLs across Europe. NATO and partner nations could fund these resources.

Conclusions

The foundational concepts of UTOs—FARP, NATO cross-servicing, and Rapid Raptor—have proven sound. UTOs offer a tremendous opportunity and options for decision makers across many fronts in both planning and execution. Resourcing, training and exercising, interoperability goals, associated guidance, and NATO / partner nation agreements as viewed through the lens of the UTO present many chances to gain synergy. As the UTO concept develops, these factors and others will sharpen our focus on the common goal of increasing combat capability to assure and deter.

As the four British F-35s touched down at Câmpia Turzii Air Base in Romania, Romanian Airmen poured from base operation buildings. The ramp came alive again as Airmen quickly began preparing to rearm and refuel the jets—their third flight of fighters for the night. The jets were back in the air within the hour, and the Airmen made sure the base was ready for the next planes. The war was going well; untethered sortie generation had unleashed the asymmetric advantage of US, allied, and coalition airpower. The Russians simply could not match the flexibility and capacity of alliance and coalition command and control, mobility, and logistics. ✪

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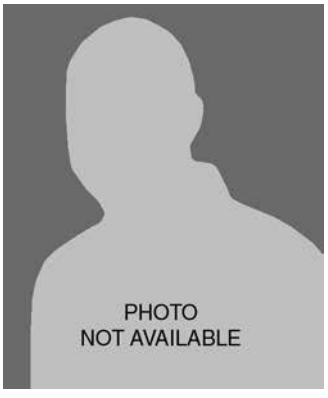

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The Quest for a New Airpower Strategy

Systemic Paralysis and Systemic Empowerment

Col John Andreas Olsen, Royal Norwegian Air Force*

*The opinions and conclusions expressed in this article are those of the author; they do not represent or reflect the official position of the Norwegian Ministry of Defence or any other agency.

Carl von Clausewitz (1780–1831) spent a large portion of his 51 years attempting to develop a coherent theory of warfare that linked strategy to tactics. He defined strategy as the use of the battle for the purposes of the war. Strategy formed the plan of the war, mapped out the proposed course of different campaigns that comprised the war, and regulated battles that had to be fought in each of the campaigns.[1]

Basil H. Liddell Hart (1895–1970) expanded the term beyond its military meaning by referring to "grand strategy" rather than the Clausewitzian "military strategy" or "pure strategy." According to Liddell Hart, Clausewitz's definition was too narrow

and battle-centric, implying that battle was the only means to a strategic end. Stated differently, while war bounded the horizon of strategy, grand strategy had to look beyond the war to the subsequent peace.[2]

Noted historian Alan Stephens offered a further refinement, defining strategy as the art of *winning* by purposely matching *ends*, *ways*, and *means*:

> First, [decision makers] must clearly understand what, in the prevailing circumstances, they mean by winning. And second, they must ensure that their desired ends are realistic, clearly defined, and consistent with political objectives; that the ways chosen to pursue those ends are feasible; and that the available means are suitable and sustainable. The importance of establishing and maintaining a logical relationship between winning and ends, ways and means cannot be overstated.[3]

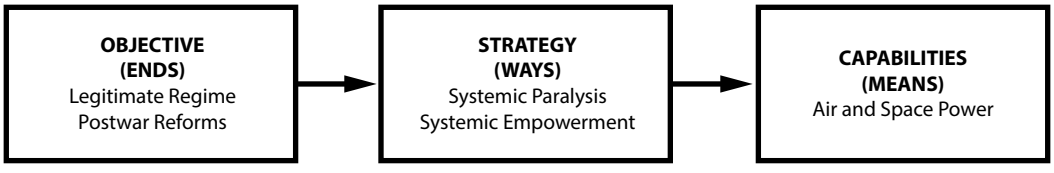
This definition is especially useful when assessing North Atlantic Treaty Organization (NATO) and US-led operations over the last 25 years. When examining the desired outcome of "crisis management" from the mid-1990s on, we see that operations in Bosnia-Herzegovina (Operation Deliberate Force), Kosovo (Operation Allied Force), Afghanistan (Operation Enduring Freedom), Iraq (Operation Iraqi Freedom), and Libya (Operation Unified Protector) have a common denominator: ultimately, the West has sought broad political, socioeconomic, and military reforms in these states. As soon as military objectives are met and the combat phase transitions into postconflict activities, NATO members and their partner nations focus on broader transformations, including security sector reform.[4]

The postmilitary goal of "winning the peace," as opposed to "winning the war," basically consists of establishing a functioning, legitimate government structure based on Western liberal values. That goal may not be formally acknowledged, but it would be logical, prudent, and pragmatic for NATO to acknowledge and plan for this desired outcome and thus avoid squandering initial military successes.[5]

Logically, therefore, when NATO members find it necessary to conduct military operations short of "collective defense," they should consider designing military campaigns with this objective in mind from the outset so that the transition between military combat and follow-on reform processes is as seamless as possible. This does not mean that NATO should engage directly in or be responsible for all aspects of nation building but that NATO should plan and conduct operations so that military engagement contributes to creating the conditions for attaining the desired end state of functioning, legitimate governance. Although that ideal may prove unattainable, it provides an overall framework in which NATO adapts its goals for postwar reform to the circumstances.

With those caveats in mind, this article suggests that NATO members develop military-strategic concepts that better link the application of force in general—and airpower specifically—to the ultimate objective of all NATO-led interventions: winning the peace through sustainable postconflict reform. Doing so requires a conceptual approach that views the nation of interest as a *system*, coupled with a strategy that seeks to combine *systemic paralysis* (of the opponent) with *systemic empowerment* (of the supported ally) using both lethal and nonlethal means in pursuit of *strategic effects*.[6] The article calls for improved linkage between statecraft and military power as well as between security sector reform and airpower through strengthening NATO centers of excellence. It proposes a generic, system-level ap-

proach to warfare and subsequent nation building that challenges traditional military planning, which usually centers on "the battle" and views nation building strictly as the domain of civil authorities. It also suggests that airmen can play key roles in building and sustaining local institutions as well as developing host nations' aviation capabilities. After proposing that NATO adopt the framework depicted in the figure below for its approach, the remainder of the article elaborates on these concepts.[7]



Winning: Safe and Secure Environment

Simply stated, "winning" consists of establishing a safe and secure environment that can sustain itself without external assistance and that fosters economic growth and eventual prosperity. The details of the desired end state will vary from one NATO-led intervention to another because each situation presents unique features and challenges. For the purposes of this article, it is useful to define three conditions that must be met to achieve "good governance." First, a regime must establish and maintain internal security as well as law and order. Second, it must enable people to earn a reasonable living, have access to education and social services, and practice their religion of choice. Finally, a regime must encourage trust and loyalty by instituting and supporting effective anticorruption policies, a credible justice system, integrity-building measures, professionalism, and merit-based selection in the civil service. If people feel safe in pursuing their daily activities, can provide for themselves and their families, and view their government as legitimate, then opposition groups will find it more difficult to garner levels of popular support that would endanger the basic level of security and stability sought by NATO and its allies.

Ends: Legitimate Regime

Efforts aimed at security sector reform seek to facilitate the development of effective structures with decision-making processes under democratic, civilian control. NATO's Partnership for Peace Program has proven itself an effective methodology for supporting and encouraging reforms, including the judicial, economic, and educational spheres.[8] NATO should not simply project a Western model into other social and cultural environments; rather, the partner government (or opposition movement) should respect and accept the basic principles of "good governance"—transparency, responsibility, accountability, participation, and responsiveness (to the needs of the people)—before Western states commit resources to supporting it.

Freeing a country from a regime that preys on its citizens and its neighbors is one thing, in which NATO's preponderance of military power can prove decisive; building up a nation on the basis of democracy, individual liberty, and the rule of law is quite another. The question therefore becomes, how can NATO shape a military campaign from the start to support the objective of sustainable peace? Such a campaign would help a benign government anticipate and avert rather than react to crisis, instill confidence among its population, increase legitimacy, and lay the foundation for a future relationship with NATO. All of this requires strong international cooperation and dedication. Most international organizations prefer to coordinate rather than be coordinated, but a credible international politico-military organization must take the lead. Such coordination has so far been the missing link in modern operations, and implementing it might help reduce the gap between successful military operations and confused, prolonged, and incomplete or ineffective peace-building efforts.

Ways: Systemic Paralysis and Systemic Empowerment

Although Western defense forces have achieved great success in modernizing their equipment, force structure, and training, that modernization has not extended into strategic thinking. Thus, current military doctrine governing regular and irregular warfare continues to emphasize war-fighting capabilities rather than the opponent's overall system and strategic effects. This practice stems largely from the still-pervasive belief that only ground forces can ensure military victory and that enemy leaders will capitulate only when they admit defeat on the "battlefield."[9]

Joint campaign plans favor physical destruction of the adversary's ground forces, and operations are designed to "seize and hold ground," "close with the enemy," and "search and destroy." Consequently, airmen are often constrained to use airpower only to support the ground commander's scheme of maneuver and to destroy targets directly related to the adversary's ability to engage in combat. Although airpower has proven itself highly effective at taking out tanks, artillery, and supplies, this line of thinking imposes severe limitations since defeating the enemy's armed forces removes only one aspect of the problem. Western strategists must overcome their obsession with "the battle," concentrating instead on comprehending both enemy and friendly systems and their leaderships, which represent not only the cause of the conflict but also the source of any sustainable solution. The systemic approach emphasizes that military force is but one of several political instruments for dealing with an opponent. The works of J. F. C. Fuller, Basil Liddell Hart, John R. Boyd, John A. Warden III, and others offer excellent points of departure in this regard although, admittedly, they tend to focus more on paralysis than empowerment.[10]

Systemic paralysis would prevent a nation, government, or key forces from executing the actions they favor while systemic empowerment would create better conditions for friendly actors to assume power. The former sets out to degrade, destroy, disrupt, and deny, but the latter seeks to encourage, enhance, establish, and educate. The duality at play is not easy but provides direction and perspective: paralysis and empowerment are partly complementary and partly subject to simulta-

neous and sequential actions, depending on the context. Moreover, this dual concept entails two lines of operations that should be conducted in parallel: one *process oriented* to achieve *psychological* impact and the other *form oriented* to achieve *physical* impact. Process concerns the intangible—mental and moral—aspects of warfare while form deals with the material sphere.

As an illustration, systemic paralysis sets out to weaken and freeze the opponent's leadership, its decision-making processes, and its mechanisms for command, control, management, and communication without permanently crippling large amounts of the nation's infrastructure. Disrupting an opponent's decision-making calculus renders it increasingly deaf, dumb, and blind—thus unable to act constructively and coherently. This approach uses incapacitation to neutralize key elements of the adversary temporarily, break his cohesion, disrupt his adaptability, and deprive him of timely reorientation. Unable to keep pace with the tempo of events, the adversary's decisions and actions become strategically irrelevant. When NATO also works with local friendly forces, this combination of psychological and physical effects can prove difficult to withstand.

Systemic empowerment sets out to enhance and encourage the local actors that NATO wishes to strengthen: the alternative to the unacceptable regime. If NATO members and partners decide to become involved in an "out-of-area" theater in which insurgents pose a threat to the government they seek to support, the preferred method should be to advise and support the host nation. NATO should concentrate on *advising, training, educating*, and *equipping* the local government and its military and security forces, avoiding direct combat unless absolutely necessary. This approach can deter potential insurgents and give indigenous forces the upper hand early if military confrontation does arise.

This concept ensures that strategy focuses on war ending rather than war fighting, thus eluding the pitfall of reducing strategy to tactics. The systemic approach views both friends and enemies as systems—with centers of gravity, critical vulnerabilities, and key linkages. Although "systems" are not necessarily mechanical and linear—and in fact may be highly complex and adaptive—even an agile and decentralized enemy can still be viewed as a system. An in-depth system-of-systems analysis allows for a broader and all-inclusive approach to affecting key political and physical nodes and connections. Actions that engage centers of gravity, target sets, and individual targets should contribute to attaining the predefined desired strategic effects and should set the conditions for follow-on activities such as establishing good governance and nation-building measures.

Means: Air and Space Power Capabilities

Airpower should play a central role in this approach since it can function as both a political tool and a strategic weapon. Modern fighter-bombers, with their unique combination of speed (maneuver), intensity of force application (precision), and ability to attack from beyond enemy range (stealth and standoff), give new meaning to the three classic elements of warfare: mobility, strike, and protection.[11] Similarly, space capabilities are redefining the concepts of reach and persistence, making

the extraordinary precision of today's weapons possible in the first place. Recent improvements in air and space technology open new paths to using resolute military force without deploying large numbers of troops, thus approaching the ideal of winning without extensive fighting on the ground and suffering the associated casualties. Why should combatants enter a tactical "red zone" if strategic and operational effects can be dictated from a safe distance? Why should they occupy territory if they can control events from afar?

Avoiding traditional wars with their perverse, long-lasting impacts—thus lessening the suffering and recovery time of the defeated party—can reduce postconflict resentment and make peaceful coexistence more likely in the future. Through its unique characteristics of responsiveness, scalability, lethality, and accuracy that minimizes risk to lives on both sides, airpower offers political decision makers and military commanders extraordinary flexibility and potential strategic impact. It creates significant advantages by using *tempo* as a strategic quality in its own right. Only recently has technology made it possible to attack *multiple centers of gravity* in parallel regardless of their locations, to strike them in very *compressed time frames*, and to control the degree of damage inflicted.[12]

Modern airpower can hit targets with great accuracy (precision of impact), but the higher level—*precision of effect*—makes the difference. Space capabilities extend that precision even further. However, the ability to strike anything must not translate into an approach of striking everything. Proper analysis is critical: choosing the right targets is not a technical exercise. Instead, it requires knowledge of and insight into opponents' culture, the inner workings of their power base, and their interior dynamics. Again, the concepts of systemic paralysis and systemic empowerment emphasize the importance of acting discriminately to increase the likelihood of desired effects and decrease the likelihood of unintended consequences.

By streamlining the winning-ends-ways-means nexus, airpower can play a pivotal role in linking the application of force (both lethal and nonlethal) to creating conditions that promote development of stable government. Military planners must first establish clear objectives for operations and a strategy for realizing those objectives based on systemic paralysis and systemic empowerment. In examining the potential contributions of each service, the strategic discussion must recognize what airpower can contribute either as an independent, offensive, and possibly decisive instrument or as an enabler and a facilitator for other operations and efforts. With the ends and ways established firmly, the leadership should then turn its attention to optimal use of the four main airpower roles: control of the air; intelligence, surveillance, and reconnaissance (ISR); strike; and maneuver.

To perform these roles and their associated missions effectively, NATO members need to improve capabilities in various areas. Traditional topics of discussion in the area of military technology include low observability (or stealth), improved fusion of systems to gain knowledge dominance, and similar advances in the ability to find, identify, track, and prosecute air and surface targets from a substantial distance. When combined, these technologies radically redefine mass, speed, maneuver, strike, and situational awareness.

This does not constitute an argument for "airpower alone" but for a shift away from deploying huge numbers of friendly troops on the ground "out of area." The

new precision airpower capabilities allow for novel forms of intervention in international crises. The old saying "If the enemy is within range, so are you" is no longer always true.

Operation Enduring Freedom saw the employment of small groups of special forces assisting indigenous ground units that, in combination with precision airpower, succeeded in toppling the Taliban. During Operation Iraqi Freedom, the United States employed a similar concept in the north of Iraq, this time pairing special forces with Kurdish Peshmerga. Combined with the support of precision strikes and ISR assets, 13 Iraqi divisions were fixed in the north and largely rendered ineffective. In 2011 during Operation Unified Protector, NATO to all intents and purposes employed the so-called Afghan Model in Libya. This time, after having blocked the advance of Libyan regular troops toward Benghazi, a small number of special forces of various nations trained the Libyan rebel forces. The combination of persistent air surveillance and air strikes was instrumental in bringing about the overthrow of the Gadhafi regime although this was never a NATO objective.[13] During Operation Serval (2013–14), small numbers of widely dispersed French ground troops, combined with aviation and fixed-wing air strikes, managed to block the advance of insurgents in Mali. All of these operations proved quite successful from a military perspective, but they were not connected to a postconflict order and thus failed to promote long-lasting stability.

Aviation advisors who are sufficiently culturally aware to work with host nations in the long term to build air and space capabilities can serve as key elements in a larger development and stabilization strategy. This approach demands skills and equipment that can be transferred to the host nation and calibrated to available resources. NATO would first have to determine what the host nation wants and needs in terms of airpower capabilities before establishing what both the recipient and NATO can afford; it would also have to place the emphasis on people, not technology. Because most conflicts now occur in the poorest countries of the world, even limited air and space power capabilities can make a significant difference. Some people argue that it is too expensive and too manpower-intensive to help other states build and maintain such capabilities, but the cost of becoming directly involved in combat is far greater.

Having studied 17 major counterinsurgency (COIN) campaigns, Dr. James S. Corum asserts that host nations can employ airpower with great effectiveness if they have some help. Small nations primarily need basic preparations and simple low-tech equipment, combined with instructions on how to plan, lead, and execute joint campaigns. Corum identifies six key areas in which airpower traditionally has made its mark during COIN operations: surveillance and presence, troop transportation (primarily helicopter transport of light infantry forces), armed strikes (primarily close air support), medical evacuation, liaison, and psychological operations.[14]

Successful campaigns combine military operations with government reforms, education and propaganda efforts, and economic programs that address the needs of the population; as a result, such campaigns win over the population.[15] In this sense, the military must engage in nation building. Supporting countries must acknowledge the actors and dynamics of the host society to facilitate a constructive working relationship among the *government*, its *people*, and its *military and security*

forces. They should therefore focus on enabling the supported nation to build capabilities and competencies in accordance with the principles of good governance; engage with the population in rural and urban areas to establish intentions, direction, determination, and confidence; and conduct comprehensive security sector reforms involving the military, police, and intelligence services. Developing air forces, both military and commercial, must be seen as part of this larger enterprise so that the effort does not detract from, but contributes to, the legitimacy of the supported government.

NATO's Partnership for Peace Program has a template that could serve as a generic point of departure for defense and security sector reform. Such a program could train selected *aviation advisors* who understand the profession of airmen; have technical, tactical, and organizational experience and skills; and possess a comprehensive understanding of COIN operations as well as the local conditions in which they will operate. Properly implemented advice and support will have a deterrent effect on insurgents, reducing casualties and cost if a situation escalates to violence and armed clashes. Air and space power has much to contribute; therefore, advising, training, and equipping partner air forces could form the major centerpiece of NATO's COIN policy and strategy.

Part of the solution consists of developing modern COIN theories and doctrines that take air and space power into account in two ways. On the one hand, air and space power can contribute to improving social and economic conditions, winning "hearts and minds" in accordance with the *soft power* principle. On the other hand, air and space power represents effective and efficient *hard power* because it can support policies such as "search and destroy," "containment," and "blockage" through precision targeting. NATO's Comprehensive Approach can serve as a viable point of departure for improving COIN theory and doctrine.[16] Although the strategy of systemic paralysis is clearly preferable to killing, destruction, and attrition, these parameters are also part of the equation; ideals and reality do not always match.

Augmenting airpower with space capabilities can supply precision effects in both deterring an opponent and enabling the subsequent development of sustainable good governance. Space as the ultimate high ground offers an ideal vantage point for observation over a wide area. Advances in both the resolution of images and the amount of information contained in those images now allow an astonishing number of previously unimagined applications. For example, *satellite crop monitoring* could enable a friendly government to recognize the signs of drought or blight and plan in advance to transport food and new seed supplies into affected areas, thereby preventing hardship and nurturing popular support. Alternatively, governments could identify areas growing crops such as opium poppies and take appropriate action. Such monitoring would help create a sustainable and robust society after the conflict. Civilian and commercial organizations might actually execute these missions, but NATO could help coordinate them so that they align with the larger reform strategy. Here, again, airmen associated with NATO could contribute valuable advice based on their understanding of how best to use these platforms.

A similar argument can be made for *monitoring natural disasters* from space. Detailed knowledge of local situations can help a government make effective plans to mitigate the effects of disasters as rapidly as possible. NATO could draw on many

civilian and commercial options to aid friendly governments, including the newly launched European Sentinel-1A satellite and even a European center of excellence. The same resources employed for monitoring natural disaster can be used to *observe refugee camps and movements* and to *detect and document genocide*.

As noted, the capabilities used for these activities may or may not be military; for example, in addition to military satellites usually optimized for intelligence purposes, many commercial satellites and drones monitor various phenomena. Coordinating the use of these many resources presents the key challenge—one well suited to an international organization such as NATO. Smaller nations in particular may be unable to afford complex, expensive military air and space systems, but with appropriate expert guidance, they could develop a cadre of expertise in how to utilize all of the various resources most effectively in activities that include both deliberate planning and crisis response. Centralized coordination would avoid duplication and enable optimal allocation of existing infrastructure and assets, enabling NATO and its members to obtain the greatest value from military and civilian capabilities and ensure a logical transition between them.

Prospects: The Winning-Ends-Ways-Means Nexus

It has long been a truism that military victories do not necessarily yield political success—to a large extent because military plans focus on "the battle" rather than on the actual end-state objective: a stable, benign government. Unfortunately, definition of an end state that is both legally and morally credible has been in many ways the missing ingredient in modern strategy and warfare. This article has proposed a conceptual approach that views the nation of interest as a system linked to a strategy that seeks systemic paralysis of opponents and systemic empowerment of legitimate forces through the use of air and space power in pursuit of strategic effects.

Fundamentally, NATO should envision a functioning state aligned with common NATO and Partnership for Peace values as the enduring legacy of any intervention. Existing bodies that plan and conduct air operations should take into account both the need to paralyze the enemy and the need to enable long-term good governance by the desired regime. To bring about this result, NATO members should consider creating planning cells in appropriate military institutions and organizations that would coordinate the use of all data made available through the new ISR systems to advise allied governments. Although some individuals might argue that such a cell would fit best in the foreign ministry rather than a ministry of defense, military officers have been trained and educated to devise complex, overarching plans. The key is to integrate the uses of airpower with other forms of military and political instruments of power to maximize both systemic paralysis and systemic empowerment.

Some individuals might suggest that NATO cannot bring about "good governance" in all nations where it decides to intervene militarily. Even so, such an objective gives NATO the necessary direction for establishing "a better state of peace" and a basis for prudent, deliberate, and comprehensive end-game planning. Others might argue that it is not NATO's place to take the lead in fostering government reform, but this article proposes that NATO conduct military operations in a way that en-

ables and supports a subsequent reform effort. No other organization is in a better position to do so. NATO leaders should always think through the entire winning-ends-ways-means nexus prior to deciding on military intervention. The grand end-game strategy cannot remain terra incognita. NATO must accept this responsibility if it is to prevail in future conflict.

This approach will not succeed in all circumstances; nevertheless, it offers a conceptual framework that challenges the notion that victory depends on force-on-force engagements and proposes a better use of air and space power to win the peace for which presumably the war is fought. NATO cannot and should not try to remedy all the ills of the world, but the organization does need to develop a conceptual framework that clearly defines end-state objectives before military operations begin.

As integral players in the process, airmen must understand, believe in, and teach end-game strategy as the foundation of airpower.[17] They must embrace a specifically air-minded approach. In other words, they must stop accepting the view of airpower as merely an adjunct to or substitute for ground-based operations. Instead, they should explore and define how to connect airpower directly to the desired end state of peace and stability. In doing so, they must develop a new vocabulary and terminology that helps them become effective advocates for a new conceptual approach. To bring this about, NATO member states should conduct in-depth studies that explain what joint air and space power can offer political and military leaders in the context of a strategy of *systemic paralysis* (of the opponent) and *systemic empowerment* (of the supported ally). These studies would remind NATO of previous lessons and set the conditions for improved outcomes in the future. In addition, NATO should consider the following recommendations:

- *Strengthen the Civil-Military Cooperation Centre of Excellence* (CCOE).[18] NATO should consider developing unified concepts that link the application of air and space power to security sector reform. The study could be considered "the Comprehensive Approach 2.0" and a reboot of "effects-based operations" but would emphasize turning theory into practice because the true value of theory is expressed in better action. Sponsoring nations must give the CCOE a clear mandate to produce deliverables and allocate a dedicated task force comprising both military and civilian members and including air and space experts; security sector reform analysts; political, judicial, and sociocultural advisors; nongovernmental organizations; and specialists knowledgeable about particular societies, countries, and regions. This task force could also develop a concept for ways of strengthening security sector reform in NATO's Partnership for Peace Program, focused on building capabilities and linking those capabilities to other sectors of governance. The CCOE could offer courses and seminars, possibly based on experience in Afghanistan, Iraq, and elsewhere, to educate officers (including foreign area officers) and political advisors who might become involved in future operations.
- *Strengthen the Joint Air and Space Power Competence Centre* (JAPCC).[19] NATO should ensure that the JAPCC becomes a dynamic and vibrant environment for mastering air and space history, theory, strategy, and doctrine; a milieu for cultivating broader knowledge of and insight into air and space; and a setting

in which such experts have the opportunity to communicate their narrative to politicians, the media, and fellow officers, and to interact for mutual benefit with experts from all sectors of governance. Their activities must have a strategic and conceptual focus—not a tactical and technological one. NATO members and partners need to dedicate the "best and brightest" to such assignments with the objective of producing a series of high-quality, RAND-like studies as well as a serious outreach plan for sharing the findings with politicians, officers, nondefense civil servants, and academics. In this way, the JAPCC could become an intellectual hub for new, forward-leaning, air-minded strategic thinking; furthermore, its sponsoring nations should consider upgrading the JAPCC's mandate, promoting participation, and making better use of the center's resources. The JAPCC should also consider taking the initiative to develop a new dictionary of airpower terminology that accurately captures today's airpower roles and missions, ensuring that this vocabulary makes sense when connecting national policy, reform, and airpower.[20]

- *Establish advisory and support teams for host nation air and space power capability and competence building*. As described above, NATO should consider revitalizing the concept of *air advisors* with allocated resources for air and space power capability building in partner states. Such an effort can build on burden-sharing principles in which some states may provide specialized capabilities. Advising, training, and equipping partner-nation police, intelligence services, and militaries, as well as applying mechanisms that strengthen state and government, will offer the most effective means of discouraging, deterring, undermining, and defeating insurgents. Such teams must be joint and combined; further, they must operate in concert with representatives of several agencies and departments within the umbrella of defense and security sector reform. The centers of excellence mentioned can serve as conceptual reachback institutions.

Although strengthening these two centers of excellence offers the key to developing new concepts based on *systemic paralysis* and *systemic empowerment*, NATO should also explore better ways to increase dialogue and cooperation among all its centers of excellence to make the most of NATO's resources and its ability to coordinate and conduct activities across the full spectrum of intervention.

The concepts and recommendations presented in this article are cost effective, build on established institutions and practices, and suggest directions for the environment after the International Security Assistance Force completes its mission. Ideally, NATO could build on this foundation to better match the application of force to the overall purpose of any military intervention: winning the peace. ✪

Notes

1. Basil H. Liddell Hart, *Strategy*, 2nd rev. ed. (London: Faber & Faber, 1967), 319.
2. John Andreas Olsen, "Introduction," in *The Practice of Strategy: From Alexander the Great to the Present*, ed. John Andreas Olsen and Colin S. Gray (Oxford, UK: Oxford University Press, 2011), 1–3.
3. Alan Stephens and Nicola Baker, *Making Sense of War: Strategy of the 21st Century* (Cambridge, UK: Cambridge University Press, 2006), 13.

4. For more detail on security sector reform (SSR) as a concept, see, for example, "Security Sector Reform," United Nations Peacekeeping, accessed 17 March 2015, http://www.un.org/en/peacekeeping/issues/security.shtml; Security Sector Reform Resource Centre, accessed 17 March 2015, http://www.ssrresourcecentre.org/; "Security Sector Reform," United Nations, accessed 17 March 2015, http://unssr.unlb.org/; and US Agency for International Development, US Department of Defense, and US Department of State, *Security Sector Reform* (Washington, DC: US Agency for International Development, US Department of Defense, and US Department of State, 2009), http://www.state.gov/documents/organization/115810.pdf. The concepts "security sector" and "security sector reform" first appeared in the late 1990s, and although these relatively new terms have become widely used, no single definition has been established. For the United Nations, and as outlined in the *Report of the Secretary-General on Security Sector Reform*, SSR describes a process of assessment, review, and implementation as well as monitoring and evaluation of the security sector. The goal of SSR, as stated in the mentioned report, is the "enhancement of effective and accountable security for the State and its peoples, without discrimination and with full respect of human rights and the rule of law." See General Assembly Security Council, *Security States and Societies: Strengthening the United Nations Comprehensive Support to Security Sector Reform; Report of the Secretary-General* (New York: General Assembly Security Council, 13 August 2013), 3, http://issat.dcaf.ch/content/download/35390/514513/file/Second%20Sec%20Gen%20Report%20on%20SSRSecuring_States_and_Societies_A%2067%20970_S%202013%20480.pdf.

5. See, for example, Fred Charles Iklé, *Every War Must End*, 2nd rev. ed. (New York: Columbia University Press, 2005); and Patricia L. Sullivan, *Who Wins? Predicting Strategic Success and Failure in Armed Conflict* (Oxford, UK: Oxford University Press, 2012).

6. It may be difficult to identify allies, but at some point, NATO must think about an acceptable leadership—and it makes sense to do so prior to an armed conflict.

7. This is a revision of "A New Air, Space and Cyber Concept," which the author submitted as part of JAPCC's *Future Vector Project* in 2014. I am grateful to my reviewers for significant contributions: Pete Engelmann, Richard P. Hallion, Peter Layton, Holger H. Mey, Margaret S. MacDonald, Rohan Maxwell, Phillip S. Meilinger, Richard T. Reynolds, Alan Stephens, and John A. Warden III.

8. See Rohan Maxwell and John Andreas Olsen, *Destination NATO: Defence Reform in Bosnia and Herzegovina, 2003–13*, RUSI Whitehall Paper 80 (Abingdon, England: Routledge Journals, 2013).

9. For details on this view, see Robert A. Pape, *Bombing to Win: Air Power and Coercion* (Ithaca, NY: Cornell University Press, 1996).

10. For strategic paralysis, see, for example, David S. Fadok, *John Warden and John Boyd: Air Power's Quest for Strategic Paralysis* (Maxwell AFB, AL: Air University Press, 1995). For further exploration, see John Andreas Olsen, ed., *Airpower Reborn: The Strategic Concepts of John Warden and John Boyd* (Annapolis, MD: Naval Institute Press, 2015).

11. Alan Stephens, "Fifth-Generation Strategy," in Olsen, *Airpower Reborn*, 128–55.

12. John A. Warden, "Smart Strategy, Smart Airpower," in Olsen, *Airpower Reborn*, 93–127.

13. For a detailed analysis of Operation Unified Protector, see Christopher S. Chivvis, *Toppling Qaddafi: Libya and the Limits of Liberal Intervention* (Cambridge, UK: Cambridge University Press, 2014); and Kjell Engelbrekt, Marcus Mohlin, and Charlotte Wagnsson, eds., *The NATO Intervention in Libya: Lessons Learned from the Campaign* (Abingdon, Oxon: Routledge, 2013). For the Afghan model, see, for instance, Erica D. Borghard and Constantino Pischedda, "Allies and Airpower in Libya," *Parameters* 42 (Spring 2012): 63–74.

14. James S. Corum, "The Right Airpower Doctrine for Unconventional Wars" (paper presented at the Turkish Air War College Conference, Istanbul, March 2013); and Corum, "The Role of Airpower in Current and Future Small Wars," in *Aerospace Power: Beyond 100 Years of Theory and Practice*, ed. James Fergusson (Manitoba: Centre for Defence Studies, University of Manitoba, 2005), 67–84.

15. See David Petraeus, "Learning Counterinsurgency: Observations from Soldiering in Iraq," *Military Review* 86, no. 1 (January–February 2006): 2–12. Petraeus lists 14 "observations." For further context, see Beatrice Heuser, *The Evolution of Strategy: Thinking War from Antiquity to the Present* (Cambridge, UK: Cambridge University Press, 2010), 419–37.

16. For more on the comprehensive approach, see "A 'Comprehensive Approach' to Crises," North Atlantic Treaty Organization, 13 November 2014, http://www.nato.int/cps/en/natolive/topics_51633.htm.

17. See Col John A. Warden III, "Strategy and Airpower," *Air and Space Power Journal* 24, no. 1 (Spring 2011): 64–77, http://www.airpower.maxwell.af.mil/airchronicles/apj/2011/2011-1/2011_1_04_warden.pdf.

18. See Civil-Military Cooperation Centre of Excellence, accessed 17 March 2015, http://www.cimic-coe.org.

19. See Joint Air Power Competence Centre, accessed 17 March 2015, http://www.japcc.org.

20. I am particularly grateful to Alan Stephens for the "dictionary" recommendation, made in correspondence of 11 March 2015.

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Airpower in Modern War

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American leaders and Western democratic governments in general have indisputably used airpower as the "go to" means to employ the military instrument of national power. Most conventional military actions since 1991 have begun with, or were entirely comprised of, airpower campaigns—at least on the friendly side. Given a 24-hour news cycle and an atrocity-hungry culture feeding multimedia misery to a craving public, one has to wonder if American airpower can still be effective.

This article asserts that we can use airpower proficiently in contemporary risk- and casualty-averse conflicts but that we must first understand the broad evolution and maturation of airpower theory as well as the state of the strategic environment in which we operate today. America needs further sensible investment in both people and equipment. To create successful strategies for tomorrow, we need to incorporate lessons learned from today's controversial conflicts.

This article examines the history of airpower and predominant airpower theories from the perspective of the contemporary strategic environment characterized by a 24-hour media cycle and high sensitivity to casualties. In light of recent conflicts, the article attempts to answer the question "So what?" regarding our likely strategy versus our adversary's. It introduces a mechanism called the "atrocity threshold" to assist in analyzing a conflict situation for future strategy development. Finally, the article offers recommendations for future airpower strategies.

A Century of Airpower Thinking

Since publication of Giulio Douhet's book *The Command of the Air*, airpower advocates have struggled to assert the strategy behind exploitation of the medium of flight to achieve national interests, and an elite cadre of warrior-scholars has promoted new uses of airpower to realize national ends.[1] In World War I, airpower demonstrated that it had greater potential for warfare in the air than merely artillery spotting. Douhet and Billy Mitchell argued that airpower could prevent wars of attrition—killing one another piecemeal. They believed that air warfare could reduce casualties and spare nations from wars of annihilation. The will of the enemy became the new target; toward that end, directly attacking civilians seemed the mechanism of choice. Of course, technology was a key factor leading the theorists to consider bombing cities—the new heavier-than-air aircraft represented cutting-edge technology; targeting and bombing were recent inventions and hardly precise. Early theorists flirted with the use of chemical warfare and bombardment of cities,

principally to affect morale and will. Moreover, they suggested that "command of the air," what we now call air dominance, was not only possible but necessary to enjoy success on future battlefields.[2]

During the period between the two world wars, airpower technology grew in starts and stops. Western democracies experimented with different organizational structures to control airpower. Great thinkers at Maxwell Field, Alabama, built on Mitchell's ideas during the later interwar years, devising a new and practical airpower concept: the industrial web theory.[3] Though debates among students and faculty at Maxwell's Air Corps Tactical School could be tactical in nature, their strategic underpinnings differed significantly from the US Army's concern with small wars.[4]

Industrial web theory was a key component that made airpower advocates in the interwar years quite different from their Army counterparts. The concept of attacking the enemy's capacity to fight went beyond close observation or direct support of ground troops. This truly new idea espoused using aviation to strike critical points deep inside the enemy's territory and thus collapse his resistance. This theory supplanted attacking an adversary's will by supporting systemic paralysis through the pragmatic removal of his ability to fight.

American airpower in World War II served many practical roles, including interdiction of supply lines and air support to Allied ground forces as well as air superiority, escort, intelligence, resupply, and delivery of troops and supplies. Approaches taken by the British and the American bomber fleets in the European theater demonstrated the difference between attacking the morale of the enemy populace and decimating his ability to make war. On the one hand, the British chose night saturation bombardment, burning down Nazi cities and urban military targets in an effort to impair the Germans' will and to influence their ability to fight—though the accuracy of their bombardment techniques made counterforce a rationalization. The Americans, on the other hand, chose daylight precision bombardment although it was a nascent capability at the time, and such flights over heavily guarded Nazi factories and industries posed a far greater threat to the aircrews than the British night approach. The Norden bombsight, B-17s, and B-25s enabled strategic bombardment in accordance with industrial web theory. Precision was certainly a relative term at the time, and even the American daylight approach involved punishing communities around targeted sites.

The Air Corps experimented with tactics and technology in both theaters. In Europe the Air Corps learned that drop tanks and long-range fighter escort of bombers throughout the bombing mission reduced losses to German fighters. In the East, after Gen Jimmy Doolittle's raid on Japan, the Army Air Corps escalated to firebombing Japanese cities. The campaign culminated with the dropping of the Little Boy and Fat Man atomic bombs, horrific weapons that made an invasion unnecessary by breaking the Japanese will and bringing World War II to a close. Although Hiroshima and Nagasaki included military-industrial targets, the message sent to and received by the Japanese was that America could annihilate them completely. The B-29 and the early atomic bombs verified Mitchell's prescient anticipation of total war and the use of airpower to end it.

The impact of airpower in World War II together with the rise of the Soviet menace gave weight to those leaders who promoted an independent, full-time Air Force. In 1947, the Air Force did in fact win its independence. The new service faced its first substantial test during the Korean War—the last time American forces fought without air superiority, which freed allied forces from attack from the air by controlling the airspace above them. Jet technology and more accurate weapons-delivery systems improved the effectiveness of airpower. In Korea and, later, Vietnam, airpower—other than the strategic bomber force—substantially followed Army dogma: provide interdiction and direct battlefield air support of ground forces. As the Cold War settled in, strategic bombardment mutated to the employment of nuclear weapons with bombers on alert and, later, missiles to carry those weapons.

The Korean War saw new technology, including jet combat and a tremendously high American kill ratio. Budget battles between the service chiefs grew heated during this time, the Air Force and its atomic bomber fleet now competing for limited dollars with the Army and Navy. Historians noted that "although President Truman's approval was only 'tentative,' the Secretary of Defense had decreed that one service—the Air Force—should get well over one-third of future defense budgets."[5] From 1956 on, Strategic Air Command maintained roughly one-third of its strategic bomber force on alert, prepared to respond if the Soviet Union launched a "first strike."[6] The Air Force refined its aerial-refueling technology, extending the bombers' range and making them a formidable, global Cold War nuclear deterrent.

During the Vietnam War, although the principal daily use of airpower resembled its employment in Korea and World War II, the line between strategic and tactical air forces began to blur. The September 1970 edition of Air Force Manual 11-1, *United States Air Force Glossary of Standardized Terms,* channeled the interwar Air Corps Tactical School in its definition of strategic air warfare:

> Air combat and support operations, designed to effect, through the systematic application of force to a selected series of vital targets, the progressive destruction and disintegration of the enemy's war-making capacity to a point where he no longer retains the ability or will to wage war. Vital targets may include key manufacturing systems, sources of raw material, critical material, stockpiles, power systems, transportation systems, communication facilities, concentrations of uncommitted elements of enemy armed forces, key agricultural areas, and other such target systems.[7]

By the late Cold War, AirLand Battle had come to dominate airpower strategy. Essentially, the concept suggested that airpower supplemented the Army's fight against the Soviets at the Fulda Gap.[8] According to US Army Field Manual 100-5, *Operations,* 1986,

> The design intent is for a numerically inferior force to be able to use its superior battlefield vision . . . to direct a massive interdiction effort. . . . These strikes would complement the main battle area commander's intent of using his more concentrated and synchronized firepower at the critical place and time against the enemy by limiting the quantitative advantage that enemy would enjoy.[9]

When the Soviet Union collapsed in 1991, the Cold War receded from America's collective consciousness, and some members of Congress felt that a "peace dividend" justified shrinking the American armed forces. Strategic Air Command and Tactical Air Command merged into Air Combat Command although few people

understood what that action portended. The Air Force's first strategic plan for a post–Cold War conflict was a product of the times: avoiding casualties, feeding a 24-hour news cycle, and using coercion to reach national goals. However, in this case, the chief national instrument of power was joint airpower supported by a large combined and joint surface force. The plan recognized the synergy of new technology, particularly precision weapons and long-range airpower projection, as well as the ability to attack fleeting, time-sensitive targets. In Operation Desert Storm, airpower brought down the fourth-largest military in the world through a six-week aerial-bombardment campaign followed by a 100-hour mop-up ground campaign with an astoundingly low casualty rate among coalition members.

Airpower revisited familiar roles in Desert Storm, but it departed from the past reliance on supporting a ground force. Bombardment of a number of strategic and battlefield targets in Operation Instant Thunder, the politically driven "Scud hunt," and a tremendously effective battlefield air interdiction effort called "tank plinking" set the conditions for a quick rout of the Iraqi military. They also led to a successful 12-year—mostly silent—air occupation of Iraq that contained the aggressive aspirations of Saddam Hussein until the overthrow of his regime during Operation Iraqi Freedom in 2003.[10] Desert Storm demonstrated new technology and thinking about the use of airpower in battle wherein ground forces supported air rather than vice versa.

Between the first and second Gulf wars, America used airpower to occupy terrain in enforcement of United Nations sanctions against Iraq. When a provocation occurred, the coalition—mostly America and Britain—responded with a token demonstration of force or a counterpunch—sometimes via cruise missiles, sometimes via fixed-wing aircraft. In 1999, in response to Iraqi provocations such as antiaircraft artillery firing on coalition fighters, Joint Task Force Operation Northern Watch, led by then–brigadier general Dave Deptula, changed strategy. Instead of tit-for-tat counterpunches limited to offending sites, his planners designed air strikes to target any element of the Iraqi air defense system when Iraq threatened any hostile action—not just the offending Iraqi military position. This procedure reduced the tit-for-tat provocations by increasing the enemy's uncertainty. Operation Southern Watch followed a similar doctrine under Gen Hal Hornburg, enforcing an aerial occupation with precision strikes and thus driving up the cost for Iraqi recalcitrance.

Adversary leaders learned from Northern and Southern watch, particularly Slobodan Milošević, the Serbian president who caused considerable destruction and enabled mass atrocities not seen in Europe since World War II. Concomitant with the aerial occupation of Iraq in the 1990s, Milošević became a key European actor responsible for widespread death and dislocation as well as North Atlantic Treaty Organization (NATO) reaction and airpower intervention. In 1995 NATO allies responded to provocation with Operation Deliberate Force.[11] Milošević and local Bosnian-Serb strongmen used civilians as human shields to protect military targets, a tactic that hamstrung the allies to some extent. The end state in Bosnia was a dramatic population shift that separated ethnic people who had lived together with minimal conflict under Josip Broz Tito when the area was known as Yugoslavia. As one Deliberate Force researcher noted, "The lesson of that conflict is that . . . strategic success in peace enforcement operations depends on the imposition of humanitarian constraints upon military operations."[12]

In 1999 the Balkans ignited again, and NATO responded with Operation Allied Force, which proved that airpower alone could win a major international conflict—doing so decisively after a three-month air campaign across Serbia and Kosovo. Although Desert Storm had demonstrated airpower's ability to crush an enemy's military and his ability to fight, Allied Force effectively sapped Serbian president Milošević's will to continue.[13] A combined air operation similar to Desert Storm although less intense, Allied Force saw fewer strike missions but more stealth and precision employed in a coercive campaign to force Milošević to withdraw from Kosovo. Unfortunately, this coercion occurred after the Serbian ethnic cleansing campaign had significantly affected the Kosovar populace. Even with the successful debut of the B-2 bomber, using airpower to coerce a recalcitrant adversary proved an imprecise art.

During this second interwar period of no-fly zones in Iraq and air war over the Balkans, airpower theory—aided by technological improvements—leaped ahead. In his seminal monograph *Effects-Based Operations: Change in the Nature of Warfare*, Deptula suggested that precision and speed create mass of their own. Airpower could now help "control" an adversary instead of simply destroy fielded forces or support an army:

> The first night of the Gulf War air campaign demonstrated that the conduct of war had changed. One hundred fifty-two discrete targets—plus regular Iraqi Army forces and SAM [surface-to-air missile] sites—made up the master attack plan for the opening 24-hour period of the Gulf air war. The Gulf War began with more targets in one day's attack plan than the total number of targets hit by the entire Eighth Air Force in all of 1942 and 1943—more separate target air attacks in 24 hours than ever before in the history of warfare.[14]

Deptula fostered the most significant change in the conduct of aerial warfare since Billy Mitchell. Just as they had opposed Mitchell, surface-force traditionalists fought Deptula's new ideas. His effects-based operations led to time-critical targeting—a methodical, deliberate form of "compellance": "Well beyond the activity of destroying an opposing force lies the ultimate purpose of war—to compel a positive political outcome."[15] Indeed, Deptula's framework influenced the successful air campaigns in Operations Allied Force, Iraqi Freedom, and Enduring Freedom. Today, joint targeting cells and Air Force doctrine reflect Deptula's theory of airpower and the changing nature of warfare.

After the terrorist attacks of 11 September 2001, airpower again was the instrument of national choice during Enduring Freedom in Afghanistan. That operation built upon the increased stature enjoyed by the US Air Force after the successful Allied Force endeavor over Serbia and Kosovo in European Command's theater. The Afghanistan operation sought "to overthrow the Taliban government of Afghanistan that was providing a safe haven for al Qaeda and its leader, Osama bin Laden, and in the process hopefully eliminate al Qaeda itself."[16] Over Afghanistan, airpower proved decisive when paired with ground controllers. This war saw the unlikely juxtaposition of Air Force combat controllers, embedded in Army special forces ground teams, riding on horses and using handheld Global Positioning System locators and radios to call in air strikes.[17] Destruction of time-critical targets proved devastating to the Taliban, again demonstrating American reliance on conducting operations while assured of overwhelming mastery of the air.

In 2003 the George W. Bush administration opened another front in the global war on terror. Iraqi Freedom was a relatively conventional application of airpower that supported a surface battle of maneuver. Yet, when the Army stalled because of a severe three-day sandstorm, aircraft continued to pound strategic and tactical targets day and night. The Public Broadcasting Service reported that on 25 March, "five days into the invasion, the American advance on Baghdad stalls. Back in Washington, retired generals have been appearing on television and commenting that the war is not going as well as it should because there are not enough combat forces on the ground."[18]

When the weather broke, the US Army's 173rd Airborne Brigade landed in northern Iraq to work with Kurdish forces, "calling in air strikes when Iraqi forces try to move forward."[19] When American forces entered Baghdad on 5 April 2003, they "encounter[ed] morning traffic and many Iraqi defenders . . . dressed in civilian clothes."[20]

Notably, when asked about civilian deaths during the war, military historian Frederick Kagan responded that

> When you're talking about civilian casualties in war, it's very important to understand that there will always be civilian casualties in war.
>
> The U.S military took extraordinary pains to avoid civilian casualties in a campaign in which an incredible amount of ordinance [*sic*] was dropped all across a country, including in extremely densely inhabited areas. Overall, America's success in avoiding large numbers of civilian casualties was astonishing.
>
> The problem is we're living in a world where the expected rate of success is 100 percent. We count up from zero how many civilian casualties there are, and every one is unacceptable. . . . In war, reality doesn't actually work that way.[21]

As US forces redeployed from Iraq and as part of the disastrous Arab Spring series of Arabian populist and often fundamentalist revolutions occurred in 2011, NATO intervened in Libya's civil war, using airpower alone to protect and support local opposition forces on the ground. The intervention, the American part of which was known as Operation Odyssey Dawn, was a success "in several important respects." Specifically, it helped topple Mu'ammar Gadhafi's regime without requiring "the deployment of [allied] ground forces, with very low levels of collateral damage, and no NATO casualties. . . . The cumulative attrition effect of precision airpower enabled a rebel victory on the ground."[22]

Although the Libyan campaign succeeded in removing Gadhafi, neither NATO nor the United States effectively fostered a workable follow-on government. In 2014 the Syrian civil war led to creation of the self-appointed Islamic State (ISIS), which took control of wide swaths of Syria and Iraq in a reign of terror unseen since the Rwandan genocide or the atrocities of Pol Pot and Hitler. Unstable conditions and the absence of a strong central government allowed ISIS to establish a franchise in Libya.[23] Moreover, Boko Haram in Nigeria has now aligned itself with ISIS.[24] Meanwhile, al-Qaeda, at least in part, has merged with the Islamic State. In Yemen, al-Qaeda overtook the formerly friendly government. Iran is actively supporting the Shia militias in Iraq and Yemen in addition to Hezbollah and Hamas, worldwide terrorist organizations, while simultaneously pursuing nuclear weapons. One might observe

that the United States won its recent post–Cold War battles but has not yet won the peace.

The Influence of Collateral Damage and the Perception of Risk on Strategy

In a democracy such as ours, the ability to fight depends upon the will of both the people and civilian leaders. Deliberate Force, Bosnia in 1995, and Enduring Freedom, as well as the 2009 and 2014 Israeli Gaza operations, demonstrated clearly that at some points, national will can balance upon collateral damage—principally when using airpower as the lowest-risk application of the military instrument. Enemies have blatantly used civilians as human shields, including families and children, in an attempt to affect the will of the democratic populace and leaders, deterring them from acting. Gaza in 2014 differed from Bosnia in 1995 in terms of existential risk. America itself was not fundamentally at risk in Deliberate Force, so human shields proved an effective deterrent. In Gaza, using human shields, placing rockets in United Nations schools, and launching rockets from inside densely populated residential areas failed to inhibit the Israelis because, by putting the entire population of Israel at risk from more than 3,000 rockets launched at population centers, Hamas only made the Israeli population more determined to act.[25]

Gaza offers a good example of the use of a modern poor man's air force or airpower. Third world countries or terrorist groups can employ unguided rockets, missiles, and perhaps even inexpensive drones because fighter or bomber aircraft are just too complex and expensive to operate. With these imprecise terror weapons, they may produce effects similar to those of traditional manned airborne platforms at a fraction of the cost.

By the time Desert Storm began in 1991, the Iraqi air defense system was formidable, and its surface-to-air missiles and Scuds provided the type of poorly guided, cheap airpower that the United States is reticent to use for fear of inflicting collateral damage. The American Patriot missile defense system and the Israeli Iron Dome, as well as the several strategic antiballistic missile systems funded by the Missile Defense Agency, are purely defensive means of countering similar threats. In an attempt to reduce unnecessary casualties, Western democracies refuse to use unguided ballistic missiles as offensive airpower as did Germany in World War II and Iraq, Hamas, and Hezbollah, armed by Iran, more recently.

Phenomenon of the "Atrocity Threshold"

An important mechanism, referred to here as the atrocity threshold, affects the conceptualization, planning, and conduct of postmodern military operations. The will of both the public and elected leadership is influenced by the number and type of casualties, depending upon a number of factors, including whether or not the casualties are civilian, children or adults, women or men, and documented by the media. Location of the conflict and its relationship to American national interests are also factors.

Faced with a recalcitrant threat to national interests, democratic leaders—with tacit agreement by the democratic populace—will first attempt to use the diplomatic and then the economic instruments of national power. If those fail to achieve the desired results—as they did with Hitler in the 1930s, communist regimes in Korea and Vietnam in the 1950s and 1960s–70s, Saddam in 1991 and 2003, Milošević in 1999, the Taliban in 2001, Libya in 2011, and the Islamic State in 2014—America can resort to the military instrument.

Typically, building a coalition is the first step—sometimes the only step—although it may occur concurrently with the use of diplomacy and economic sanctions. With some degree of multinational support, our next move is to employ airpower, which may be either land- or sea-based. However, to conduct surge operations for more than three days, America requires a full-time Air Force with land-based airpower. With or without the deployment of ground forces, we enter a softening phase, which can prove decisive in toppling an adversary's government, as in Serbia, Afghanistan, and Libya, or a prelude to a ground phase for stability or transition to peace operations, as in Afghanistan or Iraq.

Yet, our modern calculus stumbles, for we tend to use the same formula repeatedly without consciously considering the mechanism at play. Specifically, when the number and type of atrocities reach a certain level, popular opinion can compel democratically elected leaders to take or cease military action. During the Libyan civil war, America and some European partners employed airpower almost exclusively to tilt the balance to the side that desired to remove Gadhafi.[26] The casualties primarily occurred in a closed country, and few media outlets were on the ground to fill the 24-hour news cycle. Few Western casualties, low interest, and the use of only airpower made for limited media, no boots on the ground, few atrocities, and low popular democratic interest. Conversely, two years of civil war in Syria, media documentation, solid evidence of the use of chemical weapons against civilians, hundreds of thousands of civilians killed, and millions of people displaced combined with war weariness and domestic economic troubles to invoke outrage—although it proved insufficient to force America to commit in force.

In Gaza, when the Israelis faced thousands of rockets raining down on their cities, they rapidly moved from airpower coercion to the brute-force compellance of ground forces. It is noteworthy that the losses in combat in Gaza were less than 1 in 100 (roughly 2,000 dead, as controversially reported by Palestinian sources).[27] Casualties in the Syrian civil war amounted to over 200,000 dead (according to third-party reporting).[28] During the Gaza campaign, however, the media focused disproportionately on Israel.

The threat of rockets and tunnel-bound terrorists indiscriminately attacking Israeli civilians influenced Israel's atrocity threshold, reminiscent of the initial phases of Enduring Freedom when President Bush enjoyed popular support for his successful airpower-centered campaign in Afghanistan.[29] Humanitarian considerations remained important throughout Enduring Freedom. Later, however, as the operation dragged on, reports of civilian casualties caused by air attacks in Afghanistan slowly shaped the reduction in the coalition's use of airpower despite the fact that collateral damage was minimal compared to that of historic campaigns.[30]

Today we face the Islamic State's terrorist-led, terror-enforced occupation of a significant swath of the Fertile Crescent. More brutal than the members of Hamas, these Sunni Muslim terrorists expanded from Syria into Iraq. ISIS has routinely tortured and killed Syrian and Peshmerga military prisoners and brutally murdered and beheaded Western journalists, care workers, and others, uploading slick, professionally produced videos of the killings online. After numerous reports of mass atrocities by the Islamist terrorists, the United States committed to a small-scale coalition air campaign—Operation Inherent Resolve—principally aimed to degrade or destroy the Islamic State.[31] After half a year of dropping munitions on ISIS targets, the cumulative sortie rate is less than that of the first week flown during Desert Storm.[32]

Although our action against ISIS may grow, in the better part of a year there has been little public will to engage militarily beyond airpower and a quite limited ground support force. This attitude will not change unless the engagement is either low risk or the administration makes a stronger case that it is in the best interest of America to battle the terrorist state on its own territory instead of ours.

So What?

Will the United States see tactics from future adversaries similar to those the Israelis witnessed in Gaza or those from the Islamic State (i.e., human shields, overt manipulation of the media, and murder of civilians)? It is safe to assume that we will. More than two decades of war in and around the Muslim world have shown us that there are no boundaries, morals, or international standards of conduct inhibiting our enemies.

Manipulating international media by shamelessly using the atrocity threshold is a simple and easy method of influencing Western political power. Strategists should recognize it for what it is: that America is particularly susceptible, especially when we face no clear-cut state actor posing a well-defined or existential threat. ISIS has demonstrated an aptitude for highly stylized propaganda, the unabashed ability to murder people on film, and an affinity for attracting the world's most deranged psychopaths to join their ranks by the tens of thousands. When enemies fail to hold human life as dear as we do in Western democracies, we can expect disinformation, propaganda, and more deliberate and pervasive use of cyberspace as clear weapons of war. Therefore, sensitivity to collateral damage will hinder the use of airpower and may put leaders in a position where dramatically handcuffed airpower is insufficient to be decisive.

In Allied Force, we saw that Milošević learned from watching a decade of aerial occupation in Iraq. He knew that Saddam hunkered down and survived enforcement of the no-fly zones and that his war-fighting capability was only minimally affected by selected American air strikes. Ultimately, airpower weakened Milošević's grip on power and won the day, but other adversaries learned that tunneling and waiting for the media to grind allied operations to a halt by sapping the American and Western world's will are viable tactics. In Afghanistan, Iraq, and Gaza, potential adversaries demonstrated a keen learning curve, using Goebbels-like propaganda

techniques to reach millions—those whom America's enemies can depend on to follow well-established prejudices without debate—via a multitude of modern communications venues.

Stories or rumors of the air operations over Afghanistan killing civilians—or, at least, "reportedly" civilians—led to restrictions on the use of airpower. The trend is clearly to demand more precision with less collateral damage. Yet, in Afghanistan, in Gaza, and today in Iraq and Syria, even very good intelligence cannot guarantee safety for civilians collocated with weapons or enemy troops. In fact, distinguishing civilians from enemy combatants can prove impossible—our enemies dress as civilians on purpose, regardless of international laws of warfare.[33] Their goal is to disappear, melting into the civilian populace and remorselessly using them as camouflage and human shields. Therefore, our enemies clearly use our own atrocity threshold against us.

Terrorists are not the only adversaries we face today. In the Ukrainian-Russian crisis, we see poor man's airpower in the hands of the Russian-backed separatist rebels. Supplied by their sponsor with antiaircraft artillery and missiles, the rebels have little need of complex aircraft. The downing of Malaysia Airlines Flight 17, which killed 298 persons, was likely the result of a type of SA-11 surface-to-air missile battery supplied by Russia, perhaps even manned by Russians.[34] Fear of conflict with a freshly jingoistic Russia has left the European Union and United States mostly flatfooted. The Ukrainian rebels have destroyed several Ukrainian military aircraft, yet destruction of the civilian Malaysian flight finally approached the European atrocity threshold—at least to the point that the European Union was willing to support American-led economic sanctions against Russia. However, like the Syrian civil war, the Ukrainian war—even after the loss of Flight 17—has not proven sufficiently provocative for the United States to do more than supply nonweapon material support.

Strategic Planning Recommendations

Keeping in mind this discussion of history, modern factors such as the media, sensitivity to collateral damage, a 24-hour news cycle, the poor man's air force, and the atrocity threshold, we need to consider some elements more carefully as we craft future war-fighting strategies. These should include the end state, achievable effects, technology, operational intelligence, precision, and communication.

If we intend to employ the military instrument of power, we should know why and to what ends. If we do not define the perfect future we hope to create, then only luck alone will get us there. According to Joint Publication 5-0, *Joint Operation Planning*, "Joint planning is end state oriented."[35] That publication also presents a relatively simple diagram for operational planning that starts with "where we are" and ends with "where do we want to go?"[36] If we cannot answer these two simple questions, then we are destined to fail in any employment of any instrument of power, especially the most unforgiving one—the military instrument.

If we know that we want to end a crisis and do so with minimal loss of life and minimal investment of national treasure, then we understand that leaders will migrate

to the means of airpower. The history of modern airpower has proven this tendency. We must select our desired effects with care. We must be able to produce them with the tools permitted—namely, nonnuclear, precision airpower assets and perhaps a smattering of special forces or coalition operations with native forces. If airpower is insufficient to create the desired effects, then another tool may be a better choice.

Technology plays a key role, but it is becoming an ever-slimmer American asymmetric advantage. US technology offers a significant advantage, yet some of the aircraft used by our allies in the coalition against the Islamic State are newer than our regular Air Force and Navy platforms. Only about one-fifth of the Department of Defense's budget goes to the nation's full-time Air Force, down from one-third, and some goes to other services' parochial air forces. This ratio has been declining since the ground-centric second phases of US operations in Iraq and Afghanistan (see the figure below).

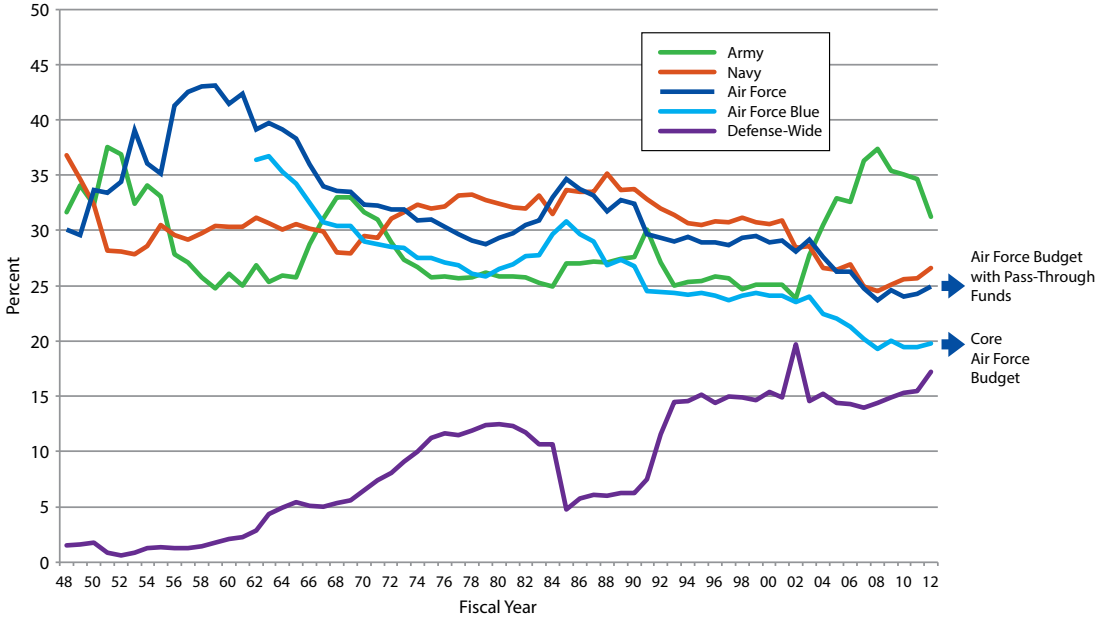

Figure. Realities of the Air Force Blue Budget. (Adapted from Douglas Birkley, "Realities of the AF Blue Budget," unpublished Air Staff chart, 9 September 2014.)

As leaders tend to turn to airpower first, we must ensure that we do not follow Germany's World War II production model. The Germans had good technology, but even with slave labor, there was simply not enough of it to compete with a higher-

production peer competitor. If we are forced to fight an enemy such as China or North Korea, even if an F-22 can kill eight planes on a perfect day, when the enemy launches 1,000 Vietnam-era MiGs, some will undoubtedly get through and either damage or kill overwhelmed defenders. We need the best technology, but we also need mass—more than a handful of silver bullets.

Intelligence has proven itself an operational capability. General Deptula and subsequent Air Staff deputy chiefs of staff for intelligence, surveillance, and reconnaissance made great strides in operationalizing intelligence. The most precise weapons in the world are only marginally useful without good coordinates. Data links and automated decision tools are important components of time-critical target prosecution. As we move to the Combat Cloud and as shooters become sensors themselves—a capability we have been moving toward since aircraft served as intelligence-collection vehicles in World War I—contemporary intelligence becomes an integral part of real-time operations.[37] We will never remove the fog of war—if properly invested, we will be able to see through it more clearly, and we have to be ready to share that information as fast and as accurately as possible.

Precision has a plethora of meanings to modern war fighters: precision in employment of the military instrument, in information, in technology, in planning, in timing, in communication, in messages, in location, in stealth, in targeting, in weapons employment, in weapons effects, and in execution. We also need precision to win the peace after the war. We must invest in precision in multiple domains and focus the precise and most useful information to enable the highest likelihood of success and minimize risk as much as practical.

Events from the time of Douhet, Mitchell, and the Air Corps Tactical School through Operations Enduring and Iraqi Freedom have demonstrated that an open, articulate information or media campaign before, during, and after the use of airpower is important to success. In Iraq, Afghanistan, and Gaza, we have seen adversaries use the media to proliferate examples of collateral damage, to beat the drum for extremist followers, or to deceive or appeal to media viewers. The leaders of Western democracy cannot afford to manipulate media to spread propaganda. To combat the adversary's awareness of the public's appetite for gruesome propaganda, smart administrative and military leaders need to think far beyond mere public affairs releases. We must execute with planning, precision, and persistence a tailored, open, and honest communication plan, clearly and professionally delivered simultaneously with our use of the military instrument.

Conclusion

A century after Douhet and Mitchell, we see airpower as the Western world's chief means of using the national military instrument of power with relatively low risk and cost. The enemies we are likely to face beyond the second decade of the new millennium have proven themselves just as evil as the villains America fought in the nineteenth century—remorseless and immoral. They have influenced how we use airpower and how we must use it in the future. Regardless of the face of the adversary, we can expect him to appeal to the prurient masses with the basest,

most barbaric use of media to advertise and recruit followers and resources—which they will undoubtedly receive. Manipulation of the atrocity threshold as a source or measure of national will is a modern reality that affects any strategy we elect to employ.

We cannot stop evolving airpower theory or strategies for employment. Can airpower adapt to low-intensity or low-interest conflicts that will likely characterize the next decades? Indeed, it can. Although airpower, with today's best precision weapons, is a tremendous means of exerting the national will, it cannot make up for an indecisive or feckless national strategy.

Notes

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Aviation and Health

A Key Nexus for the US Air Force's Regional Security-Building Efforts

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National Military Strategy and Security Cooperation

A confluence of fiscal challenges, lessons learned from Afghanistan and Iraq, and increased emphasis on US influence in the Asia-Pacific region has significantly shaped national strategic guidance in recent years.[1] One emergent theme is the importance of integrated diplomacy, development, and defense ("3D") to prevent conflict and build partner nation (PN) capacity.[2] The 2010 *National Security Strategy* mandated enhancing regional security through "spur[ring] economic growth, strengthen[ing] weak and failing states, lift[ing] people out of poverty, combat[ing] . . . epidemic disease, and strengthen[ing] . . . governance."[3] Reinforcing that imperative, Presidential Policy Directive 23, published in 2013, aims to "help partner nations build the sustainable capacity to address common security challenges; promote partner support for the policies and interests of the United States; strengthen collective security and . . . promote universal values."[4]

Building PN infrastructure is a complex task involving a myriad of interdependent facets of a nation's resources, including aviation. The United States helps PNs develop their whole-of-nation aviation enterprise to improve governance and economy. Doing so requires the coordinated expertise of a wide variety of US resources such as the US Trade and Development Agency, which has advanced public-private aviation partnerships overseas for over 20 years, linking industry leaders with US government resources such as the Federal Aviation Administration.[5] A second critical resource is health care. The United States' Global Health Initiative, established in 2009, reflects the president's commitment to improving PNs' health, underscored by creation of the Office of Global Health Diplomacy in the Department of State

(DOS) last year.[6] The US Air Force (USAF) can significantly contribute to both aviation enterprise and health systems in a synergistic fashion, providing incentive to potential PNs to work with the United States in shared security objectives.

A second emergent theme of particular relevance to the Department of Defense (DOD) is the need to maintain regional influence and access in support of national interests.[7] This national security imperative is advanced through innovative, low-cost, "small footprint" solutions to train, advise, and assist PNs to address humanitarian disasters, improve basic living conditions, and enhance interoperability.[8] A shift to share the costs of security responsibility and capability among increasingly interoperable PNs while allowing US access permits a smaller force to support PN and US interests in antiaccess/area-denial environments and deters actors inclined to threaten regional security.[9] By coupling the synergy between aviation enterprise development (AED) and global health engagement, the USAF can powerfully support defense strategic guidance to "be the security partner of choice" against threats including both natural disaster and external aggression.[10]

The USAF Response: Support a Coordinated, Whole-of-Nation Approach to Security Cooperation

AED is one of the primary means through which the USAF will build PN capacity.[11] It enables PNs to bolster legitimacy by better providing for its citizens' needs, controlling undergoverned regions, protecting sovereignty, and participating in international trade through a whole-of-government investment that directly supports the aim of Presidential Policy Directive 23.[12] Such efforts fulfill the "expectation going forward . . . that Airmen will be intellectual thought leaders and bring ideas about how to employ not just the destructive effects of airpower, but also its constructive effects—deterrence, dissuasion, assurance, humanitarian assistance/disaster relief, building partnerships, air diplomacy, and partner . . . aviation enterprise development (AED)—to service national security and foreign policy needs."[13]

Health and Aviation Enterprise Development: Phase Zero

The president clearly links global health to US strategic interests.[14] Both the development of aviation and health capacity are mutually reinforcing, extending benefits to military and civilian populations and, potentially, the national economy. The dividends are realized in both peace and war, supporting both PN and US interests throughout all six phases of conflict described in Joint Publication 5-0, *Joint Operations Planning*.[15]

Phase zero ("shaping") objectives (fig. 1) would advance through a network of airstrips near medical facilities including both simple dispensaries and hospitals to connect patients, providers, and medical (as well as nonmedical [e.g., agricultural]) materiel via a scheduled "ring route." This cost-effective means to meet geographically marginalized citizens' fundamental needs lends legitimacy to government and diminishes the likelihood of insurgency. Further, numerous studies have demonstrated reciprocity between public health and economic development.[16] Such benefits provide incentive and justification for governments to partner with the United

States to better meet immediate peacetime demands from their citizens as well as prepare for possible threats from natural disaster, insurgency, or external aggression.

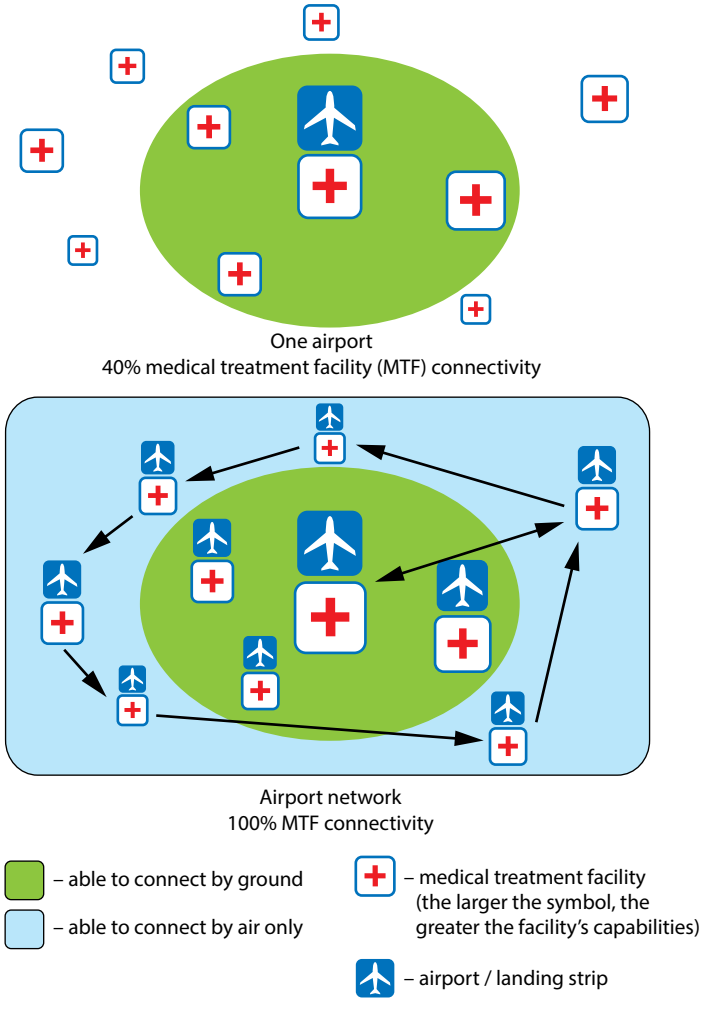

Figure 1. AED health model, phase zero (improve health resource network and governance). The model includes the following attributes: central hub schedules flow of specialty care and other resources; utilization of aircraft of opportunity and appropriately trained aeromedical teams; elective outreach as the predominant flow—ring route; and occasional hub and spoke for emergency services.

For almost a century, advances in combat aviation and medicine in the following countries/continents have translated into health services enabled by civilian aviation. They are enduring examples of the synergy between aircraft and public health.

United States

The US military initially proposed fixed-wing medical applications in 1909. World War I further stimulated aeromedical transport.

Australia

In 1917 Australian Air Force pilot (and former medical student) Lt J. Clifford Peel proposed supporting the health needs of the outback with a network of modified aircraft. Peel's vision launched in the 1920s when Qantas Airways (founded by another World War I Australian pilot) leased biplanes to a nascent health-outreach service. Today, Australia's Royal Flying Doctor service offers rural public health, primary care, specialists, and emergency evacuation service over 2.7 million square miles via a network of 21 bases and a fleet including Pilatus PC-12s, Beechcraft King Air B200s, and Cessna Grand Caravan C208s.[17] Additional sustainable, time-tested, aviation-enabled health-care systems can be found on other continents. Programs such as those described below can be developed with whole-of-government AED assistance from the United States. The universally valued potential for improved health provides a uniquely compelling phase-zero incentive for potential PNs to underwrite AED investment with the United States.

Africa

In 1957 three expatriate reconstructive surgeons began the African Medical and Research Foundation (AMREF) to bring critical health services to remote communities. The largest African-led health-development organization on the continent, AMREF now offers training and health services to more than 30 African countries. Funded by both African and non-African governments, private institutions, and individuals, it has evolved beyond air transport to deliver preventive, community-based health care with a focus on public health research.[18] AMREF continues to fly surgeons to rural hospitals where they not only perform highly specialized operations but also conduct training clinics for all levels of health professionals. Lauded by organizations such as the Bill and Melinda Gates Foundation for cost-effective health leadership, AMREF executes its flying mission with aircraft such as Cessna C-208 Caravan and Beechcraft B-200 Super King Air platforms. It also provides contracted air-ambulance care and has directly supported US DOD casualty evacuation with aircraft staffed and equipped for critical care.

South America

The Força Aérea Brasileira (FAB, Brazilian air force) provides transport for government and private health workers to serve indigenous populations in the Amazon region (fig. 2). Some mission costs are offset by private and corporate sponsorship, and aircrews benefit from the hours logged and regional familiarization, which enhances Brazilian governance in rural regions.

Figure 2. Efforts of the Força Aérea Brasileira. (Photos courtesy of the FAB.)

Journalist Douglas Engle describes images he has published, similar to those in figure 2:

> A Brazilian Air Force (FAB) Cessna Caravan [is surrounded by fog] on an airstrip on the Yanomami reserve in Roraima state, Brazil. Health conditions for the Yanomami have improved ever since the beginning of relief missions by the FAB. The FAB uses its infrastructure and know-how to promote a three part policy for the remote Amazon region near the Venezuela and Guyana borders: To show a presence of state in the inaccessible area, by taking medical personnel to those areas and finally, to train pilots during real-life relief missions in an extreme environment. The increased presence in the area is, in part, to combat drug trafficking from Colombia into Brazil through Venezuela, which has increased after border areas with Colombia have become more secure. Some say it may also be a reaction to Venezuela's recent acquisition of Russian-made helicopters and fighter jets.[19]

Asia

Recently, a senior Sri Lanka Air Force officer articulated his service's two primary responsibilities—protecting the airspace and partnering in nation building—by quoting American brigadier general Billy Mitchell: "The Air Force is the greatest developing power in the world today." The officer further pointed out that Sri Lanka Air Force ground crews construct and renovate airports around the nation, and flyers support humanitarian assistance and domestic flying operations, including tourism, to bolster the economy via scheduled and chartered flights. Thus they gain flight-hour experience with the same air crews charged with intelligence, surveillance, and reconnaissance; counternarcotics; and maritime/border patrol missions.[20]

Aviation Enterprise Development and Health beyond Phase Zero

Although assisting PNs with their aviation enterprise primarily aims to help them shoulder their own baseline security challenges, it also supports an infrastructure (e.g., aerial ports and medical treatment facilities) that is more survivable and effectively augmented if resources are overwhelmed by natural disaster, insurgency, or outside aggression.[21] Should catastrophe strike or diplomatic and development efforts fail to prevent armed conflict, AED provides the PN phase one through five benefits by means of airstrips and medical treatment facilities that can be rapidly expanded through pre-positioned materiel, as well as PN and DOD personnel resources (fig. 3). Cost-effective, shared civilian-military usage at airports is

currently reflected in more than 20 joint-use facilities in the United States alone. This resource-appropriate concept offers a redundant, resilient network of forward air bases and a scalable construct for casualty evaluation, treatment, and evacuation. Intratheater transport of medical (and nonmedical) materiel would be facilitated by adaptive, agile, dual-purpose, light, fixed-wing aircraft. Should the PN request US assistance, platforms and aircrews (including medics) could come from both nations' interoperable pools trained in foreign internal defense and would likely transition from a scheduled ring route to increased "hub and spoke" sortie flow. Just as the USAF has transitioned from C-9s to aircraft of opportunity with specially trained aeromedical teams (e.g., critical-care air-transport teams) for patient transport, so must PN training include aeromedical skills.

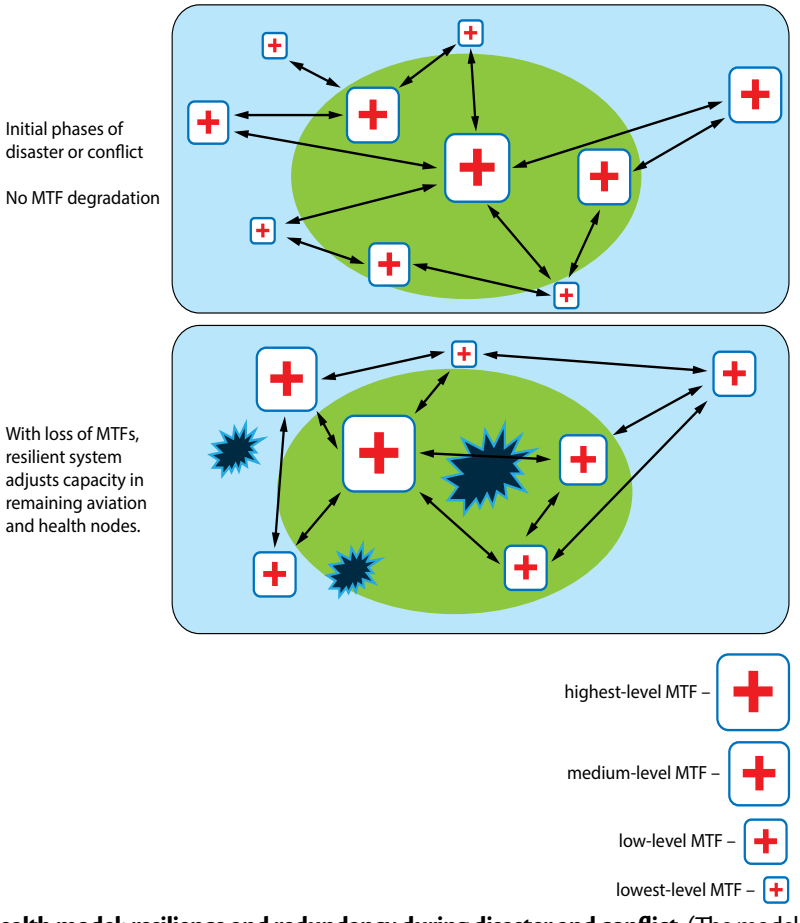

Figure 3. AED health model: resilience and redundancy during disaster and conflict. (The model includes the following attributes: lower tiers can export needs and import capabilities/resources from within the system; all tiers can upgrade from outside the system; the model provides a redundant, scalable, modular, and resilient platform for air sorties, command and control, casualty care, and offensive activities; it utilizes aircraft of opportunity and appropriately trained aeromedical teams; traffic flow and base capability can adapt to changing demands and/or resources; and predominant flow may shift to hub and spoke [materiel/resources out and casualties in/out].)

Challenges

The first step in helping build aviation and health capacity involves working with PNs to identify gaps in their response to the needs of domestic and international governance. Country teams at each embassy must understand how this investment and partnership align resources with PN demands to satisfy visible, baseline population needs as well as address potential security/military threats in a cost-effective manner. Offering rural or other underserved areas (because of great distances, mountains, or water barriers) with access to centralized, concentrated, but limited resources (from trauma/emergency care to diagnostic and therapeutic equipment to specialty consultants) via aviation is much cheaper than duplicating them throughout a nonintegrated patchwork of care. The following give foreign governments a powerful set of incentives: benefits in legitimacy, improved governance, commercial utility and economic growth, increased currency and training for aircrews in multiuse aircraft (for internal defense, counternarcotics, etc.) and an enhanced ability to respond to natural disasters.

To satisfy these roles, light, fixed-wing aircraft (see the table below) supply generally adequate capability and are relatively inexpensive to procure, operate, and maintain. Several are utilized in the health-network models mentioned earlier, and all have been fielded in relatively small numbers within Air Force Special Operations Command (AFSOC). Some have also been sold by the US government to PN air forces in a variety of configurations. As Maj Gen Michael Keltz of Air Education and Training Command observes, US air-advising support in such aircraft has proven critical in developing the Afghan Air Force.[22]

Table. Aircraft employed in health-network models

Make / Model	*Crew*	*Engines*	*Passengers*	*Range*[a] (*nautical miles*)
Cessna Caravan (C208)	Pilot	Single	10	1,000
Pilatus PC- 6	Pilot	Single	10	500
Pilatus PC-12	Pilot	Single	9	2,000
CASA 212	Pilot, copilot	Twin	26	1,000
Beechcraft King Air (B200)	Pilot	Twin	7	1,500
CASA 235	Pilot, copilot	Twin	44	2,350

[a] These ranges are rough estimates for illustrative purposes.

Recognizing the benefits of such platforms to partners around the globe, the 2010 *Quadrennial Defense Review Report* tasked the USAF to "field light mobility and light attack aircraft in general purpose units in order to increase their ability to work effectively with a wider range of partner air forces."[23] Not only should the USAF

maintain such aircraft in its inventory but also the Office of the Secretary of the Air Force for International Affairs, AFSOC, and the component numbered air forces together have a critical opportunity to inform and shape PNs' procurement of aviation platforms through foreign military sales and other mechanisms for sustainable means to build partner capacity that incorporates USAF influence for years to come.[24] In addition to "pilot training, mobility, CASEVAC [casualty evacuation], light attack, and air support for special missions" sorties mentioned by Major General Keltz as examples of the critical impact of air advisors, development of dual-use civilian/military health networks beyond casualty evacuation is furthered by the USAF's investing in these aircraft and sharing the skills to use them.[25]

Since aviation and medical systems do not build and operate themselves, planners familiar with the goals of AED and health-capacity development, together with advisors from across a broad spectrum of Air Force specialty codes—including pilots and mechanics as well as air traffic controllers and medics—are required. In addition to maintaining the Air Advising Academy, the USAF needs to organize, train, and equip to effectively support this strategic mission, enabled by enhanced cultural and often foreign language capabilities.

For operations beyond phase zero, plans must include the capacity to expand and accommodate a surge of USAF-compatible platforms and personnel. Pre-positioned supplies for aviation and medical needs as well as interoperable (made so by exercises and exchanges) PN personnel will make for a smoother transition from steady-state conditions to conflict or disaster response and from PN to shared US execution.[26]

The Way Forward

This AED health proposal supports all three components of the *National Security Strategy's* "3D" posture, providing country teams and ambassadors a compelling instrument for "air diplomacy" by building trust, creating capability and capacity for PN governance, and advancing security interests for both PNs and the United States. To realize this potential, the USAF requires "3 Ps"—partners, platforms, and people.

Partners

Ideally, prospective partners already have both a military and civilian aviation infrastructure, a history of cooperation with the DOD, shared regional security goals, a significant proportion of English-speaking citizens, and health and internal security issues (especially complicated by geography or topography) that would particularly benefit from aviation support; moreover, they would be prioritized in the theater campaign plan as strategically important. The Philippines offers a potential exemplar. Historically linked to the United States via treaty and a tradition of joint and multinational exercises, the Philippines has a medical and aviation infrastructure with geographically focused areas of excellence and a large proportion of English-speaking citizens. The nation, however, is confronted with the prospect of governing and providing services to citizens scattered over an archipelago of 7,000 islands and struggles with the threat of insurgent and terrorist activity in its southwestern

region. US special operations forces have provided constant support and a training presence for counterinsurgent/counterterror operations for over a decade.

The Philippines' recent experience with supertyphoon Haiyan illustrates the importance of aviation to population health.[27] Extensive infrastructure damage hampered relief efforts. Officials with the US DOD, armed forces of the Philippines, and US Agency for International Development (USAID) / Office of Foreign Disaster Assistance quickly established airport clearance as a top priority to allow humanitarian assistance, noting that "military capabilities enabled access to remote and difficult to reach locations."[28] Not only tactical military rescue operations but also "the ability of the U.S. and other militaries to airlift in enormous amounts of aid . . . kept morbidity and mortality relatively low."[29]

Enhancing the infrastructure of a nation such as the Philippines would begin with identifying airstrips in strategic locations in reasonable proximity to clinics or hospitals. The latter could be expanded to accommodate surge activity in response to natural disasters or conflict, overcoming "geographical constraints of conducting a wide-scale relief effort composed of isolated islands and inaccessible road networks."[30] As the armed forces of the Philippines consider replacing their aging fleet of aircraft such as the OV-10, the USAF could explore which versatile light aircraft could provide not only intelligence, surveillance, and reconnaissance and close air support but also interoperable aeromedical evacuation and materiel transport. Such platforms would prove useful in future humanitarian assistance / disaster response roles since the Philippines confronts an average of 20 typhoons per year.[31]

Platforms

Predicated on the distances between health-network nodes and the anticipated volume of personnel and materiel needing transport to enhance governance, PNs determine which light, fixed-wing, multirole transport airframes are appropriate—an area where effective "airmen-statesmen" can help inform and shape decisions that facilitate interoperability. Whole-of-government—even whole-of-nation—domestic partnerships between the USAF and agencies and contract service providers could assist that service's Airmen gain and maintain proficiency in such aircraft beyond the currently limited number in the US inventory.[32] Simultaneously, as advocated in *Irregular Warfare Strategy 2013*, the USAF should continue to seek creative, effective, and affordable means to assist PN air forces in acquiring, maintaining, and operating light aircraft.[33]

For example, funds authorized by the National Defense Authorization Act, section 1206, for training and equipping PNs to combat global terrorism and instability have been used to purchase Cessna 208s in several sub-Saharan African nations since fiscal year 2012. Casualty evacuation training on these airframes with PNs—coordinated by US Air Forces in Africa and executed by AFSOC—has already resulted in successful air transport of civilian trauma patients, reinforcing skill currency in pilots and medical crews.[34] It should be noted that humanitarian assistance programs were the first DOD-funded initiatives administered by the Defense Security Cooperation Agency (DSCA) to support security cooperation.[35] The utility of a light-aircraft-facilitated health network to bridge development interests of the DOD,

USAID, and PNs should also be considered for Overseas Humanitarian, Disaster, and Civic Aid funding.

People

President Eisenhower's observation that "plans are nothing; planning is everything" rings particularly true for security cooperation. Effective international security cooperation planning and execution depend upon building relationships to develop trust, detailed understanding, and open lines of structured communication to establish initial concepts and then modify them as needed. Maximum efficacy calls for intercultural—and often foreign language—understanding as well as familiarity with security cooperation programming, planning, and execution.[36]

According to the 2010 *Quadrennial Defense Review Report*, "The Air Force will also expand its regionally oriented contingency response groups . . . to sustain specialized expertise in regions and countries of greatest importance," and subsequent strategic documents have continued to emphasize the importance of regional expertise.[37] To do so, the same report stresses that "we can and must do more . . . to make changes to our personnel, organizations, and processes to develop and track qualified personnel for capacity-building activities, and develop critical enablers such as language, regional, and cultural skills."[38] Senior Air Force leadership agrees that an emphasis on force development is necessary for "building and maintaining language, region, and culture expertise . . . [because] thinking strategically about how peacetime operations can shape geopolitical relationships to provide advantage for U.S. foreign policy will grow in importance and positively affect individual promotions."[39] Force-development concerns include how to identify, track, and appropriately incentivize and shepherd the careers of individuals with skills in security cooperation and language, region, and culture. Deliberate development of regionally oriented personnel is specifically supported by Gen Martin E. Dempsey, chairman of the Joint Chiefs of Staff, who emphasizes the importance of such career shepherding for all geographic theaters and especially for senior leaders in Pacific Command.[40]

In recent years, the air-advising mission has been expanded to create airmen-statesmen in all Air Force specialty codes, not just in international affairs specialists. The foreign internal defense mission, historically delegated to the 6th Special Operations Squadron (AFSOC), is increasingly shared with general-purpose-force units such as the 36th Contingency Response Group, 818th Mobility Support Advisory Squadron (MSAS), and 571st MSAS, regionally aligned with US Pacific Air Forces, US Air Forces in Africa, and US Air Forces Southern, respectively. What has not changed is the requirement to coordinate funding for procurement of platforms and training with the DSCA and the Office of the Deputy Under Secretary of the Air Force for International Affairs.

The primary source of airmen-statesmen in the Air Force Medical Service is the international health specialist (IHS) program, which organizes, trains, and equips health professionals of all corps with cultural, linguistic, and security cooperation skills (e.g., planning and programming) to advise combatant command and component surgeon general staff as well as develop medical lines of engagement to support the desired end states of the theater campaign plan. To embrace AED, IHS staff

must continue to closely work with theater planners, theater special operations commands, personnel from other services, country-team security cooperation officers, and counterparts in the US DOS and USAID to ensure whole-of-government AED integration and partnership. IHS medical objectives already overwhelmingly support values and goals of the DOS's Global Health Initiative. Increased coordination with that department and USAID, however, will be critical to assure effective utilization of all US government resources as well as inclusion of nongovernmental and private organizations experienced in international development. With requests validated by country teams, theater air planners can assist PNs with building capacity to connect populations with health resources.

Summary

Security cooperation through assistance in aviation enterprise and health development enables a "small footprint" posture that helps PNs govern more effectively, provide essential services such as health care and disaster response, and contribute to regional security. If they request assistance with overwhelming catastrophes or defense from external aggressors, then US investment in AED will allow our Air Force to better integrate into and more effectively augment interoperable PN aviation and medical infrastructures.

Improving health-care capacity offers a uniquely compelling incentive for foreign governments to partner with the United States in peacetime to prepare for the full spectrum of civil and military operations. Realizing this aspiration demands significant cross-functional, joint, and international planning. Furthermore, USAF force development should continue examining means to identify, train, and deliberately shape careers to disseminate security cooperation and language, regional expertise, and culture skills throughout the service—particularly in future leaders. Additionally, effective USAF partnership will entail assisting other nations to procure and effectively operate affordable, interoperable, and multirole light aircraft.

Most importantly, Air Force components must articulate to combatant command staff the importance of coordinated AED in the larger imperative of building PNs' capacity and the unique contributions that USAF resources offer the US government (including the DOS, USAID, and our sister military departments) as well as international bodies such as the World Health Organization and nongovernmental organizations. Line and medical planners must work with embassy senior defense officials and security cooperation officers to attain this understanding and ensure that appropriate priority and resources are included in component campaign support plans and country plans. Only when requests from security cooperation officers are vetted at combatant commands and forwarded to the DSCA for funding and coordination with the DOD, DOS, and USAID can the appropriate funding sources be leveraged for maximally synergistic purposes.

B. H. Liddell Hart observed that strategy "is not so much to seek battle as to seek a strategic situation so advantageous that if it does not of itself produce the decision, its continuation by battle is sure to."[41] As part of whole-of-government coordinated assistance in aviation enterprise and health development, the USAF can sig-

nificantly contribute to national security goals such as humanitarian assistance and preparedness for Air-Sea Battle. Investment in this strategy would foster PN self-reliance; contribute to deterrence through access, influence, and targeting challenges; and, should deterrence fail, provide a means for the United States to more effectively ally with others for shared security objectives around the globe. Its realization begins with advocacy of informed combatant command staffs and US Embassy country teams that perceive the value in what the USAF offers to a remarkably broad range of stakeholders in their theaters and nations. ✪

Notes

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Strategic Reform

A Battle of Assumptions

Maj Jeremy L. Renken, USAF

Everyone has a worldview that shapes how he or she interprets the environment and interacts with others, and every worldview is based on assumptions. Similarly, those individuals responsible for the unenviable task of creating, defining, and implementing national security strategy are forced to begin with assumptions. Worldviews underwritten by inaccurate or incomplete assumptions will struggle to produce predictable outcomes, regardless of the resources applied.[1] This article submits that the current national defense strategy includes three fundamental assumptions that should be questioned in order to provide a more reliable, affordable, and enduring security strategy for our nation.

The first assumption is that "uncertainty" has become the dominant characteristic of our security environment, requiring America to spend ever more money to sustain general readiness for unpredictable contingencies. The second is that our only reliable guide star is a need to pace China with high-end forces optimized for a force-on-force clash waged close to the Chinese coast for decisive control of the Pacific. The third is that all other potential applications of military power constitute "lesser included" cases requiring merely diminished application of high-end US strength. These assumptions drive the Department of Defense (DOD) to demand an overage of unaffordable forces while neglecting the innovations and long-term investments which could ensure that the twenty-first century will be an American century.

Some people see reduced defense spending as the end of America as a superpower, but this is not the beginning of the end. Rather, it is the passing of a phase. Defense strategy should set conditions that allow America to remain a (if not *the*) global superpower, but the DOD owes the nation a feasible strategy and an affordable military. Doing so requires reassessing inherited assumptions and strategic concepts as well as optimizing military forces to backstop political objectives with tailored hard-power options.

The military cannot build these strategies unilaterally. The DOD should either inform, and be informed by, the whole-of-government strategic community or risk building a quiver full of arrows that no politician wants to shoot—or worse, can shoot well. Reinvigorating a defense strategy community that can dive deeply into these challenges in all their complexity and emerge with profound designs to make America stronger and wealthier should lie at the heart of an overdue defense reform.

Strategy in a Time of More Uncertainty—or Less?

Strategic military planning periodically cycles between "capability based" and "context based" paradigms.[2] In the first case, the nature of the next adversary is considered unknown, forcing the military to focus internally on development of advanced tech-versus-tech capabilities, often devoid of specific operational context.[3] In the second case, the nature of future conflict is predicted, and planners can optimize for success by cultivating their own—and their allies'—strengths as opposed to the adversary's vulnerabilities. If used correctly, both of these paradigms have strengths, and, once selected, both develop bureaucratic inertia that resists change. The trick is figuring out the right time to use one instead of the other. When change is required, the strengths of the alternative paradigm often offer solutions to the current crisis.

Three conditions generally determine the preferred paradigm. The first is the degree of uncertainty in the security environment. The second, the degree to which the military perceives an internal or external mandate to move away from an undesirable "way of war."[4] And the third, the desire to curate some aspect of present force structure—such as force size, technology investments, or particular missions—without self-evident justification.[5] The more uncertain the world, the more the military wants to (or politicians want the military to) leave the past behind—or the more military leaders are driven to act as parochial caretakers rather than engineers of American superpower, the more capability-based planning dominates.

The United States as a superpower has undergone two prolonged periods of capability-based planning. First, Eisenhower's "New Look" at the onset of the Cold War favored long-range nuclear deterrence over large forward forces. New Look allowed the demobilization of millions of American Soldiers after World War II and helped reset the American economy to a peacetime footing. By the end of the Cold War, concepts such as "Assault Breaker" and "Air-Land Battle" were extremely context driven with technology optimized to particular battlefields. The second capability-based period followed the collapse of the Soviet Union and continues today with generic culminating concepts like "Air Sea Battle" and hardware like the F-35.

In both cases, following World War II and the Cold War, the potential for military action was high, but the context of the next war remained unpredictable, due either to external uncertainty or shifting internal preferences. Defenders of the current capability-based paradigm point to Saddam Hussein's surprise invasion of Kuwait, peacekeeping in the Balkans, the terrorist attacks of 11 September 2001, and the rise of China as evidence of uncertainty. They go on to postulate that the devolution of destructive technologies from near peers to client states to nonstate actors will lead to even greater potential for threats to gestate in unexpected corners of the globe. All are treated as proof of uncertainty and co-opted into a narrative justifying broad defense spending on better versions of current capabilities rather than as indications of trends that have changed the context for military action.

The United States did go through a major period of uncertainty as the world thawed from the Cold War. However, trends connecting recent events enhance certainty about competitor archetypes that the military may be called upon to engage, favoring a return to context-based planning. The first likely archetype that the DOD

should account for includes rogue states enabled by weapons of mass destruction (WMD) (e.g., Iran, Pakistan, and North Korea). The second includes "competitive superpowers" attempting to create regional hegemonies to challenge US primacy and undermine American rule sets that ensure our peaceful geopolitical and geoeconomic power. This archetype is distinguished by competitive power projection and exemplified by Russia and China although the former may be collapsing back towards rogue status. The final archetype is the global insurgent who broadly rejects the Westphalian state system and threatens to wage revolutionary wars of culture and identity. There will be other enduring military missions—missile defense, nuclear deterrence, maintenance of a strategic reserve, rescue, noncombatant evacuation, humanitarian aid, and so forth—but these are only military activities within strategy. Strategy should contextualize specific adversaries and the means to achieve sufficient control over them.

Not every regional conflict demands American attention, but rogue states that reject international law and destabilize regions become a special case when they pursue WMDs. Such rogues threaten to terrorize allies or ignite arms races, both of which undermine American interests. While possession of WMDs is not a black-and-white trigger for action, the military should be prepared to deter hostilities, compel disarmament, or forcefully disarm a rogue of offensive WMDs through air strikes. The United States' recent experience in Iraq demonstrates that total regime change of the state order maintained by a rogue may be less advantageous than strikes in support of limited objectives to modify the rogue's behavior while leaving it largely intact. To maintain the strategic initiative, the US Air Force and Navy should be equipped to disarm an adversary quickly through limited-duration precision strikes with local penetration of defended territory.

As a planning factor, the scale of these operations is likely to require less capacity for high-end penetrating forces than the DOD is currently pursuing since they are likely to be used briefly and returned to a deterrence posture. Just as the United States will predictably use its asymmetric advantage in the vertical flank, so are rogue adversaries likely to exploit their asymmetric advantage in local human and physical terrain, unleashing reprisals via conventional, unconventional, and proxy forces (Russian "separatists" being only the most recent manifestation of that phenomenon). To counter this threat, the United States' land forces—experts in territorial security and human terrain—should be ready to assist foreign partners most likely to feel the brunt of reprisal via an extended conventional defense capability. At this point, the Army, special operators, and the US intelligence enterprise—supported by low-end airpower—should be ready to assist regional allies through partnership and cooperation.

Of the two "competitor hegemons," China is by far the more important. Although the rise of an Asian peer competitor tempts many individuals to dust off Cold War power models, a fundamental distinction between the Soviet Empire and the People's Republic of China (PRC) merits discussion. Following World War II, the globe was rebuilt into two distinct economic spheres of influence. The Western world, led by the United States, remained distinct from the Communist bloc. The economy of the one could rise or fail without significantly affecting the other.[6]

Strategy Regarding China

Globalization requires multiple powerful participants. The United States may currently establish the rule sets that enable the globalized market space, but the market itself requires the manufacturing engine and fiscal liquidity of China, the resource base of the Middle East and Latin America, and the technology development of America, Europe, Japan, Brazil, and India (to name but a few). The globalized market space would be diminished if a major player were knocked out, so purely competitive economic theories are insufficient to optimize creation of global wealth and security. The most promising economic strategy for the United States involves pursuing a blend of cooperation and competition to ensure that the international market grows but remains ultimately aligned to US-championed rule sets such as rule of law; protection of intellectual capital; preference for transactions denominated by the US dollar; transparent, multilateral treaty structures; access to the global commons; and respect for human rights.

Maintaining "co-opetition" between the United States and China assures that the economies of both countries remain intertwined.[7] Doing so provides our two great nations mutual levers of influence well short of warfare on a new "ladder of escalation." Considering the tremendous value added to the global market by China and the damaging void that would be left by China's departure or diminishment, US policy should manage the rise of China to cement its position as the world's "second greatest" superpower. America has repeatedly used soft power to condition China to work within the liberal institutions that underpin the current world order and can likely continue to do so. Even when China has risen to compete with America, as occurred with creation of the Asia Development Bank as a counter to the International Monetary Fund and World Bank, the effort reflects competition *within* a structure rather than rejection of one.[8] America's own rise as a superpower, beginning in the nineteenth century but exploding in the twentieth, was managed in part by Britain, which attempted to perpetuate a global system within which it could prosper. The trans-Atlantic "special relationship" and Allied success in two world wars are testament to Britain's grand strategy of cultivating an advantageous, long-term international order over raw national preeminence.[9]

Economic co-opetition and superpower cultivation often require accommodation, but the United States should maintain hard-power levers that can hobble China if it seeks exclusive regional control or pursues unacceptable policies. To that end, the defense strategic community should contextualize why, where, and how the United States can assert control over China through military action. Although an invasion of Taiwan by the PRC to force reunification is the oft-cited casus belli for US intervention (one of the inherited assumptions up for reexamination), the far more important concern is managing China's broader rise as a global power. China's rise forces it to accept an unprecedented reliance on external resources and markets, and President Hu Jintao's "new historic missions" established a new role for the Chinese military in ensuring those markets.[10] That new role exposes new vulnerabilities.

Countering force projection and holding a nation's vulnerable lines of communication at risk (sea-lanes, supply chains, and pipelines), again, happen to be a specialty of the US Air Force and Navy. Since the abject "defeat" of China may be

undesirable, given our economic interdependence, and unnecessary, given China's frequent accommodation of US pressure, guaranteeing our ability to exploit specific vulnerabilities and respond to limited escalations may be a far more effective military contribution to US grand strategy. Such limited actions allow the United States to modulate its "red lines" and ensure that China continually adapts to America rather than telegraphs monolithic strategic designs that an adversary must merely optimize against. (Paradoxically, we present China with a context-based threat par excellence, and its investment in the "Joint Anti-Air Raid Campaign" is a logical optimization to counter our capabilities.)[11]

The most obvious vulnerability of China's power-projection capability is the country's reliance on imported oil to produce the diesel and jet fuel that runs both its commercial and military ships and aircraft. China's geography has made it virtually an island with poor road and rail connectivity to the south, west, and north, and a concentrated population along the coastal east. Its geography dictates that most of the oil which eventually becomes diesel and jet fuel arrives by transoceanic vessel.[12] Close to home, China has built an impressive air defense system to mitigate the United States' ability to intervene in the Taiwan Strait, but China lacks the "away game" to defend vital resources such as energy in transit.

This does not imply that the US Air Force or Navy will sink Chinese oil tankers in the Indian Ocean (and cause environmental disasters) whenever tension escalates past diplomacy. Military options well short of sinking a vessel (e.g., influencing port access, waylaying Chinese vessels, and selectively closing straits) apply scalable pressure to China's vulnerabilities.[13] Those military options would be best suited as the coercive tools of an overall competitive economic strategy that mitigates the risk of market disruptions to the United States and its allies while maximizing the impact of disruptions on China.

The Chinese could respond by attempting to convoy their energy and/or commodity shipments with the protection of navy vessels of the People's Liberation Army, but the United States can continue to hold maritime assets at risk—particularly in the Indian Ocean, where America has near-total submarine dominance (for now). Old techniques can take on new relevance in this kind of fight with stealth aircraft mining harbors with standoff weapons and a return to the use of Marines (and now SEALs) as boarding parties to seize Chinese-flagged cargo ships as a prize for political leverage. It will also demand the cultivation of US access to, and partnerships with, nations around the Indian Ocean that own the ports on which China relies.

China's globalized role means shared risk and pain for pursuing an offshore control or distant-influence strategy. In 1905, near the height of the Royal Navy's power, First Lord of the British Admiralty John "Jackie" Fisher said, "Five keys lock up the world"; Singapore and the Strait of Malacca led the list of vital nodes.[14] China's strategy of making itself an indispensable node of the global market means it has turned the "Malacca dilemma" into shared risk for the entire globalized market, but China stands to lose far more than the United States in a contest of access. The potential for long-term, sustainable control offered by a strategy that lets the United States use the depth of multiple domains and vast geography is appealing in itself. Such a strategy showcases the extent of US reach rather than exposing the limits of our power.

Affecting China's power projection and access to energy offers an affordable and reversible set of escalation options that the US military can do (and afford) now through doctrinal modifications and redirected near-term investment. A strategy should provide a vision of victory, and victory in a military contest against China *does not* look like either a Normandy landing or "shock and awe" over Baghdad. The United States is not likely to put boots on Chinese shores or attempt a decapitation strike against the Communist Party of China—an act that could unleash Chinese weapons of last resort. Furthermore, many of China's external vulnerabilities are best exposed beyond the South China Sea, meaning that the Chinese will lack the excuse of defending their dubious sovereignty over territories they assert to be historically Chinese. Success in such a pressure campaign—or even in the unlikely event of a war—looks like the Allied maritime interdiction campaign against Japan in 1943–45, strangling the flow of necessities and leading to an inevitable, albeit slow, victory.

The DOD should exchange aspirations of a costly and risky short war to embrace a successful, long-competition strategy. We should also consider expanding our portfolio of Pacific allies beyond the dwindling number able to afford the capabilities we deem decisive for a hypothetical Pacific battle. To do so would expand US potential to enlist partners who either cannot afford the financial strain of high-end forces or whose position within China's sphere of influence prevents them from bearing the diplomatic strain of an unambiguous alignment to the United States. The security-force-assistance and partnership-building specialists of the US Army, Special Operations Command, and Air Force are uniquely optimized to provide rugged, inexpensive, tailored activities that build on touch points of shared interests around the Pacific. Many of these engagement activities thrive on shoestring resources now but could be upscaled to increase our agile strategic access and complicate China's ability to take unilateral action.

Slow, long term, persistent—successful US strategy in the Pacific will likely need words like these, but the services are currently doubling down in pursuit of resource-intensive, high-end-capability portfolios. This is potentially the most difficult part of proposing strategic reform: overcoming bureaucratic inertia and political headwind to create new strategic platforms and to invest in projects that will mature over decades rather than by the next election cycle. China is likely to exploit our perceived short-attention spans, unpredictable politics, and pay-for-play influence within think tanks to undermine such a long-term effort. The DOD should not only harmonize service strategists but also integrate a long-horizon strategic effort within the broader policy community. National strategies with such staying power are typically signature doctrines like the Monroe Doctrine, Truman Doctrine, or Carter Doctrine. It remains to be seen whether the United States or DOD can establish such an enduring doctrine with regard to China, but failure to make the attempt invites emergent pathologies to become dominant in their own right.

Strategy Regarding "Lesser Included" Cases

Finally, irregular adversaries and global insurgents, whether unleashed as proxies of a rogue state or coalescing in pursuit of their own agendas, are likely to continue demanding low-intensity containment and engagement. These threats are so consistently likely across any strategic forecast that failure to develop low-cost/low-intensity engagement capability will probably waste vast resources through constant overmatch. Takfiri terrorists, pirates, third-generation gangs, and cartels have all proven capable of threatening US interests, and the fiscal strain they impose has become our Achilles' heel. Planning to use high-end forces against such threats gives them more clout than they merit by amplifying their impact on our own resources.

Containment of irregular adversaries is a long-term affair, often continuing until they either collapse under the frustration of disallowed objectives or fracture when a subtle instrument of containment denies local political factions a unifying foe. Successful containment can thus be measured by ever-less expenditure of resources yielding a satisfactory measure of control. Fortunately, commonality exists between the types of forces required for containing a rogue's irregular proxies, establishing partnerships for security force assistance, and containing global insurgents; consequently, these low-end forces are multimission, enhancing their efficiency. The absence of any serious efforts by the Air Force and Navy to present forces optimized to the lower-end spectrum of conflict means that low-end adversaries will be able to exploit this national vulnerability for the foreseeable future.

Conclusion: Reinvigorating Defense Strategy

The DOD would serve the nation well by reassessing the assumptions that guide national strategy. If the department's assumptions are not right, then strategists risk frittering resources pursuing capabilities we cannot afford rather than reforming the DOD for success in a context we can create. The nation needs a respite from massive defense spending but cannot give up an activist, full-spectrum foreign policy or risk allowing competitors to destabilize the world into fragmented power blocs that communicate through violence. We are overdue for a reorientation from inward to outward and from capabilities to context, to design-control strategies appropriate for actual adversaries. The first step is to reject underperforming, compressed, or exceptionalist assumptions about the security environment and invest in establishing a DOD strategic community that can address challenges—complex as they may be—as they actually confront us.

If they are currently unable to identify—or politically constrained from identifying—these adversaries by name, then DOD planners should at least prepare for them as likely archetypes. This essay (remember, that word means "attempt") proposes that the DOD optimize to at least three predictable adversary archetypes. Proper understanding of each particular adversary is the key to attaining the most control from the fewest resources. Monolithic and generic strategic concepts will not do, and the DOD should resist the temptation to retreat to the false defilade that simplicity is certainty and nuance is uncertainty. The capability-based paradigm has gone far

enough, leaving the services hostage champions for pinnacle capabilities, at premium prices, to deal with catastrophic chimeras. America requires more than the defeatist refrain, "Undo sequester or face losing battles against uncertain threats." The DOD should reform—and the reform begins with strategy. ✪

Notes

1. "Unfortunately, intellectual rigor can only guarantee that reasoning is internally consistent: its conclusions follow from its premises. It cannot guarantee that those premises were right in the first place, and with bad premises, even the most rigorous reasoning will produce nonsense. Premises don't even have to be wrong to generate false conclusions. They only have to be incomplete, and no set of premises can prove its own completeness." Ian Fletcher, *Free Trade Doesn't Work: What Should Replace It and Why* (Washington, DC: US Business and Industry Council, 2011), 11.

2. The author's use of the term *context based* expands upon the rubric of *threat-based* planning. An excellent review of the cyclical transition between capability-based planning and threat-based planning can be found in John F. Troxell, "Force Planning and U.S. Defense Policy," chap. 12 in Joseph R. Cerami and James F. Holcomb Jr., eds., *US Army War College Guide to Strategy* (Carlisle Barracks, PA: US Army War College, February 2001), http://www.au.af.mil/au/awc/awcgate/army-usawc/strategy/.

3. The F-35, optimized in the 1990s to fight former Soviet Union air defenses associated with the bygone "central front" in Europe, is poorly suited to the Pacific. The F-35 lacks the range to cover Pacific Command's area of responsibility and requires creation of expensive NATO-style "main operating bases" to satiate its intense logistical demands. These facts have been the subject of multiple reports, but a particularly relevant assessment is found in David Axe, "Test Pilot Tried to Warn Navy about Troubled Stealth Jet," *War Is Boring*, 26 August 2013, https://medium.com/war-is-boring/8d09a6b858ae.

4. See John T. Correll's account of the Air Force's advocacy of "The New American Way of War," *Air Force Magazine* 79, no. 4 (April 1996): 20–23, http://www.airforcemag.com/Magazine Archive/Pages/1996/April%201996/0496airpower.aspx; and a critique of such "new way of war" concepts expertly compiled by LTC Antulio J. Echevarria in "An American Way of War or Way of Battle?," Strategic Studies Institute, January 2004, http://www.strategicstudiesinstitute.army.mil/pdffiles /pub662.pdf.

5. "The theory of 'anti-access/area denial' . . . is gobbledygook that we sell to Congress because if we just told them, 'We can kick anybody's asses,' they wouldn't buy us all the stuff we want." From Thomas P. M. Barnett, well-known Pentagon planner and author of *The Pentagon's New Map: War and Peace in the Twenty-First Century* (New York: G. P. Putnam's Sons, 2004). See Barnett, "Let's Rethink America's Military Strategy," video, 23:43, TED, February 2005, http://www.ted.com/talks/thomas_barnett _draws_a_new_map_for_peace.html.

6. "There is one clear similarity and one important difference between Chinese-US relations today and USSR-US relations in the second half of the past century. The similarity is that there is a likely enduring gulf in core principles and worldviews between China and the United States—certainly making possible another intense and lasting geopolitical rivalry. The difference, however, is that China is deeply integrated into the global economy and joined at the economic hip with the United States, whereas the USSR was not part of the global capitalist economy and its economic ties with the United States were close to nonexistent." Prof. Geoffrey Garrett, "China-US Economic Relations after the Global Financial Crisis," in *Rising China, Global Challenges and Opportunities*, ed. Ligang Song and Jane Golley (Canberra: Australian National University Press, 2011), 149.

7. Barry J. Nalebuff and Adam M. Brandenburger, "Co-opetition: Competitive and Cooperative Business Strategies for the Digital Economy," *Strategy & Leadership* 25, no. 6 (1997): 28–35.

8. Shannon Van Sant, "China Launches New Asia Development Bank," Voice of America, 24 October 2014, http://www.voanews.com/content/china-launches-new-asian -development -bank/2494903.html.

9. "Through the 19th century and up until World War II, *Europe* led the effort to spread liberal democracy and capitalism—and to guide Western nations to a position of global dominance. Not until the postwar era did the United States take over stewardship of the West. Pax Britannica set the stage for

Pax Americana, and Washington inherited from its European allies a liberal international order that rested on solid commercial and strategic foundations" (italics in original). Charles A. Kupchan, "The Decline of the West: Why America Must Prepare for the End of Dominance," *Atlantic*, 20 March 2012, http://www.theatlantic.com/international/archive/2012/03/the-decline-of-the-west-why-america-must-prepare-for-the-end-of-dominance/254779/.

10. The "new historic missions," otherwise known as the "three provides and one role" are defined as follows: "(1) providing an important guarantee of strength for the party to consolidate its ruling position, (2) providing a strong security guarantee for safeguarding the period of important strategic opportunity for national development, (3) providing a powerful strategic support for safeguarding national interests, and (4) playing an important role in safeguarding world peace and promoting common development." Provide no. 2 elevates the military's role from that of a domestic guarantor of security and Communist Party rule to that of a force projector who can ensure access to the global market. James Mulvenon, "Chairman Hu and the PLA's 'New Historic Missions,' " *China Leadership Monitor* 27 (Winter 2009): 2, http://media.hoover.org/sites/default/files/documents/CLM27JM.pdf.

11. Office of the Secretary of Defense, *Military Power of the People's Republic of China, 2009: Annual Report to Congress* (Washington, DC: Office of the Secretary of Defense, 2009), 17, http://www.defense.gov/pubs/pdfs/China_Military_Power_Report_2009.pdf.

12. Fifty-one percent of China's petroleum imports come from the Middle East, and 16 percent come from Africa via the Indian Ocean. China remains a net importer of crude oil, and 80 percent of its imports come through the Malacca Strait. China is actively expanding its pipeline capacity, but these pipelines are themselves highly exposed targets. US Energy Information Administration, *China* (Washington, DC: US Energy Information Administration, 4 February 2014), 10–11 (oil imports), 12–13 and 23–24 (oil pipelines), http://www.eia.gov/countries/analysisbriefs/China/china.pdf.

13. Col T. X. Hammes, USMC, Retired, "Offshore Control Is the Answer," *Proceedings Magazine* 138/12/1,318 (December 2012), http://www.usni.org/magazines/proceedings/2012-12/offshore-control-answer.

14. P. K. Kemp, ed., *The Papers of Admiral Sir John Fisher*, vol. 1 (London: Navy Records Society, 1960), 161.

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Tribal Warfare

The Society of Modern Airmen

Col Mark K. Wells, PhD, USAF

Throughout the seventeenth, eighteenth, and nineteenth centuries, Native American intertribal warfare across North America was common and intense. Apart from fighting over land and resources in conflict that could be marked by generally small-scale but nevertheless intense destructiveness over time, these tribes often attached immense importance to prestige and status. How one tribe stood in relationship to another was considered of great significance. In some instances, raids consisted solely of dancing and taunting opponents and included the famous practice of "counting coup," in which a living enemy was touched by hand or by a special wooden stick. In short, individual warriors and tribes sought rank and position in the larger Amerindian community.[1]

Even if modern air forces are part of a nation's larger national defense establishment, it is not too much of a stretch to suggest that all of us as airmen are members of individual tribes. For all sorts of historical reasons, this core tribe identity, in turn, has been based on what we mostly do each day. In the simplest terms, pilots fly airplanes, navigators and weapons system operators operate equipment, maintenance officers and airmen fix aircraft, personnel officers work human resources, missile folks train to launch missiles, intelligence officers do analysis and make predictions, and so on. The United States Air Force currently lists more than 120 job specialty codes—for officers alone. In the Air Force, as in Native American society—and I daresay in any hierarchical organization—rank and prestige are important to membership and success. Quite apart from the normal and easily identifiable insignia of rank that we all carry come the no less visible and equally important badges of our qualifications. In addition to these are the all-important ribbons or medals we wear to signify our achievement, earned either in peacetime or during actual combat service.

These accouterments combine to establish our formal and informal authority and, unlike the situation in civilian life, make it relatively easy for observers to discern where any military member ranks in the hierarchy. Moreover, knowledge, skills, and language further set tribes or subgroups apart and build a sense of group identity.[2] Almost from the dawn of organized conflict, military organizations have reflected a structure that resembles a pyramid with various tiers of contributors occupying a unique, identifiable status. In vernacular terms, we sometimes refer to this phenomenon as the "pecking order" or "food chain." Although some movement

up and down can take place inside these tribes or subgroups, significant upward mobility across tribal lines is generally considered far more difficult.

For all sorts of historical reasons stretching back to Homer's ancient Greece, and much earlier in other worldwide locations, actual "combatants" have long—some might say rightly—dominated the highest ranks of the world's militaries. For example, consider the classical and well-understood definition of combat: to fight, contend, or struggle during armed fighting or battle. A combatant is a person who fights and is at risk. From the earliest days of aviation, airmen who engaged in aerial action with enemies have been regarded as members of this elite group. Aircraft and flying were considered novelties, and pilots were often seen as daredevils. Many people believed that it took a special type of man to brave the obvious perils—particularly those of combat aviation.[3] This image became even more exaggerated during the First World War, especially in the popular perception. Circumstances combined to generate the favored notion that pilots were somehow "supermen" who not only had nerves of steel but also possessed physical and mental superiority. In short, for obvious reasons, pilots—or, more broadly, "flying" airmen—did the fighting and dying. Perhaps as a result of deliberate efforts made by belligerent governments during both world wars to establish and uphold their "hero" status, pilots enjoyed the highest rank in the pyramid.

To many outsiders, it currently appears that pilots lead a pampered life and that they enjoy rank, pay, and privileges far out of proportion to those of their comrades in other services.[4] Of course nonflyers in any air force have always been recognized as fundamentally essential to its operation. Aviation at its core is technologically dependent and derives its essence from a huge infrastructure at the apex of science, technology, and application. Especially today, nobody gets airborne or conducts any form of aerial operation without the investment of tens of thousands of man-hours and billions of dollars of scientific and industrial commitment. Moreover, figures gathered in 2010 indicate that for every pilot, the US Air Force has more than 23 nonflying Airmen and officers in support.[5] Consequently, one might argue that air forces necessarily require the largest tail-to-tooth ratio of any of the services.

None of this mattered very much, either in the popular imagination or inside air forces for a long time. Up until the first Gulf War in 1991, military events of the preceding 90 years had done little to disturb the tidy orderliness of the Air Force hierarchy. Pilots remained at the top, and almost everyone in the service knew it. That said, complexities inside the pilot and larger aviator tier were well known to any of its occupants. Returning for a moment to our recognition that a combatant—even a potential one—in the armed forces will generally garner more recognition than a noncombatant, we acknowledge that fighter pilots held the highest position in most air forces. Other types of flyers (e.g., bomber pilots, transport pilots, or instructors in training command) therefore occupied slightly lower subgroups yet remained in the overall highest fraternity of the tier. Among the simplest measures of this position were promotion statistics and access to higher levels of responsibility.[6]

Just after the Second World War and during the Cold War, US Air Force bomber pilots were most certainly ascendant, at least with regard to the overall direction of the service's strategy, policy, and acquisition. These officers—aviators who had largely shaped their careers through Strategic Air Command—were part of what

Morris Janowitz would identify as the "elite nucleus" that eventually gave way to a different group as the changing demands of the international security environment shaped aircraft development and deployment.[7] Over a short span of time, large, nuclear-capable bombers became less useful in wars such as Vietnam, which demanded quick and responsive support of ground operations. Even if bomber pilots ceded formal position to fighter pilots in the hierarchy of the US Air Force, however, they lost little if any of the informal authority they wielded as members of the overall pilot elite. The fact that they might "potentially" put themselves in harm's way, along with the panache and mythology associated with flying in previous wars, was sufficient to keep them there.

These reflections raise the question of whether the current nature of combat, the size and scale of the battlefield, or the very essence of the military and air forces has so changed that we absolutely need to redefine what it means to be a combatant. Will it upset the formal and informal hierarchy of airmen? As air forces around the world shrink, become more androgynous and civilianized, and—even more importantly—see their missions become far less traditional, new understandings become necessary.[8] It is difficult to imagine that traditional military measures—kinetic "fire and steel" as they are called—will ever go away. Nevertheless, it is equally clear that peace-keeping operations, nation building, and humanitarian concerns have grown in importance. These facts are already blurring distinctions among the practitioners of organized violence, citizens, airmen, combatants, and military contractors. Indeed, they have contributed also to changes inside the US Air Force regarding combat and combat-support roles. One must, of course, add the multiple, complex requirements of fighting insurgencies and conducting operations against terrorists or other non-state actors. In short, there is upheaval in the food chain!

Take, for example, the increasing use of the technology that the US Air Force is now calling unmanned aircraft systems (UAS) or unmanned aerial vehicles (UAV). Despite this official nomenclature, international print and television media refer to them pretty much universally as "drones." It is noteworthy that the Air Force made an early, albeit futile, attempt to call them remotely piloted aircraft. A cynic—or member of the pilot fraternity—would note the importance of using the term *pilot* in the title of any machine exploiting the third dimension. Whatever the name, it seems abundantly clear that drones will play an increasingly important, if not dominant, role in the future of air operations. At least in terms of numbers, they currently represent the bulk of systems acquired each year.

A similar expansion has occurred in the use of space-operated systems to enhance communication and to link intelligence, surveillance, and reconnaissance. The active exploitation of space requires the identification, selection, education, and training of an entirely new generation of Airmen. This group has slowly but steadily become an integral part of the multitiered Air Force hierarchy, but, arguably, their status within that hierarchy is yet to be fully determined.

In a similar way, the hierarchy is dealing with "cyber warriors," those individuals designated to work in the ever-expanding field of cyberspace. Although one can argue that exploitation of the electromagnetic environment has long been a part of air operations and airpower, the potential impact of computer cyberspace and artificial intelligence on contemporary warfare is profound. Rather than relying exclusively

on the physical destruction of targets—annihilation or attrition—this new way of conducting operations focuses on generating desired effects. Traditional kinetic weapons and means may be supplemented or even made obsolete by nonlethal means that could compel the enemy to change his behavior. We are already seeing the impact of nonkinetic weapons, including microwaves, cyber assault, computer hacking, directed-energy beams, radio-frequency strikes, and acoustic weapons, among others.[9]

One can hardly overstate the impact of cyber, drones, and even newer technologies on contemporary operations. One result has been expansion of the battlespace to virtually unlimited proportions. Airpower has increasingly broadened beyond land, sea, and air to include space and cyberspace. Moreover, air, space, and cyberspace function inseparably and are vital if the US Air Force is to "fly, fight, and win" and provide national security.[10] As a result, the service can no longer simply rely on a relatively small group of direct, heroic combatants for institutional leadership. Technical specialists, UAS operators, intelligence analysts, and satellite operators—many of them thousands of miles away from any physical risk—are nevertheless increasingly central to success in air operations and are having an ever-greater effect on the social culture of air forces. It follows that as air forces worldwide no longer rely on manned aircraft exclusively to carry out combat missions, their senior leadership must react to that fact and look to change the makeup of their services. Not too many years ago, it was popular to say that being a "warrior" was a state of mind rather than an actual experience. Today, to be warriors, our Airmen no longer need to kill or place themselves at risk of death. This blending of roles has led to noteworthy and noticeable changes in the hierarchy of Airmen. Friction is inevitable.

Those of us who continue to serve see this discord daily. For decades there was a feeling in the US Air Force that pilots won the majority of promotions and received special privilege regarding jobs. Organizational theory suggests that individuals will not give up this privileged position easily. As distinctions among various Air Force subgroups decline, so might one expect a fight for retention of social superiority, whether formal or informal. Under such circumstances, a typical response has been to blur the most visible distinctions among groups even further. By allowing a broader cross section of personnel to wear the visual reminders of aviation service, all members of the Air Force might feel more a part of the team. Further, senior leadership tries to increase morale by deliberately and substantially increasing the number of ratings and occupational badges. Finally, equity improves when particular career fields receive direct attention for extra promotion consideration.[11]

These efforts do not always succeed, nor are they met with universal acclaim. Whatever official and regulatory efforts take place in the realm of changes in organizational culture can be slow and generally have to overcome a host of complex attitudes based on history, tradition, and the uncertainties of human behavior. Regardless of the intent of an air force leadership's reordering of its conventional hierarchy or matching that human dynamic to the realities of modern air warfare, resistance and strife will remain. "Tribes" and subcultures likely will continue to exist for years, if not decades. It is even more interesting to consider that the very tension occasioned by emerging technologies is actually "good" for the hierarchy of the pyramid. One doesn't have to believe in social Darwinism to accept the notion that

a certain amount of organizational strife keeps everybody on his or her toes and more willing to fight for or adapt to change. Despite conflict, the best ideas generally win. Think back to Army cavalrymen in the early decades of the twentieth century and their resistance to mechanization.[12]

In this regard, an examination of drone pilots should make for an interesting case study. Media reports indicate rather too optimistically that drones are rapidly changing the "Top Gun" culture of the Air Force and that the service pins more wings on new drone pilots than on fighter and bomber pilots.[13] The latter is true, but among at least some of those who dream to fly in a conventional cockpit, there remains measurable reluctance to give up that opportunity to fly a computer joystick and operate out of a small trailer some distance from a real flight line and the roar of jet aircraft.[14] Nonflyers perhaps too often overlook the kinesthetic pleasure and emotional satisfaction of airplane flying. Flying can even be considered romantic, and the connections to mythology are clear—witness the story of Daedalus.

One finds other manifestations of the current unsettled atmosphere of Air Force culture and hierarchy. The recent incident at Malmstrom AFB in Montana, where more than 90 missile-launch officers cheated on a monthly proficiency examination led to the relief of 10 commanding officers. Cited among the complex reasons for the scandal was the perception among these officers that their work was professionally unrewarding and undervalued. For too long, this absolutely vital mission had been dismissed, marginalized, ignored, or, in the vernacular, "pushed too far down the food chain" to matter.[15] One need only recall that the number of brand-new Air Force second lieutenants who volunteer for missile crew duty is comparatively low.

Where does all of this leave us? Given centuries of Western military development and the obvious human admiration for courage, bravery, self-sacrifice, and victory, it hardly seems possible that our Homeric notions of the warrior ethos will undergo any fundamental change. In short, at an intellectual level, Air Force leadership should—and, I hasten to add, with good reason—strive to reorder its traditional tribal hierarchy of occupations, but I fear that the effort will never entirely succeed. Regulations cannot do what emotion and the power of human responses can. Cyber warriors, drone operators, computer specialists, and satellite drivers, may—and, perhaps most certainly, will—determine the outcome of any future major conflict. But like the American Indian tribes of two centuries ago, human emotion as much as logic will dictate the hierarchy among Air Force personnel. If we search for common themes, it seems difficult to overlook the impact of mythology and a certain romantic view of how each group or subgroup can contribute to the welfare of the whole. However expanded the contemporary definition of *warrior*, we collectively seem to default to our earliest human origins engaged in conflict. In the United States, like our Native American predecessors, from our earliest years we Airmen have sorted ourselves out as tribes. This process continues, albeit at an accelerated rate, and, whatever the outcome, it is only as transitory as technology and may result in overall improvement. ✪

Notes

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2. Samuel P. Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MA: Belknap Press of Harvard University Press, 1957), 7–18.
3. Picture sec. I, *New York Times*, 6 November 1910.
4. Max Hastings, *Bomber Command* (London: Pan Books, 1981), 254–56.
5. "2013 USAF Almanac," *Air Force Magazine* 96, no. 5 (May 2013): 37–38.
6. For a discussion of military hierarchy and the value placed on combat service, see Morris Janowitz, *The Professional Soldier: A Social and Political Portrait* (New York: Free Press, 1971), 54–75.
7. Michael R. Worden, *Rise of the Fighter Generals: The Problem of Air Force Leadership, 1945–1982* (Maxwell AFB, AL: Air University Press, 1998), 235–38. See also Janowitz, *Professional Soldier*, 150–51.
8. Charles C. Moskos, David R. Segal, and John Allen Williams, eds., *The Postmodern Military: Armed Forces after the Cold War* (New York: Oxford University Press, 2000), 1–27.
9. Maj David W. Pendall, USA, "Effects-Based Operations and the Exercise of National Power," *Military Review* 84, no. 1 (January–February 2004): 20–31.
10. Rebecca Grant, "The Dogs of Web War," *Air Force Magazine* 91, no. 1 (January 2008): 23–27.
11. See Lt Col Lynne E. Vermillion, "Understanding the Air Force Culture," research report (Maxwell AFB, AL: Air War College, 1996), 50–52; and Air Force Instruction 36-2903, *Dress and Personal Appearance of Air Force Personnel*, January 2014.
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14. Dan Parsons, "Debate Continues over Role of Simulators in UAS Pilot Training," *National Defense* 98, no. 721 (December 2013): 38–40.
15. Brian Everstine, "Commanders Fired, Changes Coming for Nuclear Missile Officers," *Air Force Times*, 28 March 2014.

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Book Reviews

The Allied Air War and Urban Memory: The Legacy of Strategic Bombing in Germany by Jörg Arnold. Cambridge University Press (http://www.cambridge.org/), 32 Avenue of the Americas, New York, New York 10013-2473, 2011, 400 pages, $113 (hardcover), ISBN 9781107004962.

Ultimately, *The Allied Air War and Urban Memory* is not about the conduct of that war except as an inflection point. As the subtitle indicates, it is about the legacy of that war. Although it provides little in the way of insight to the Second World War itself, it does offer a superlative description, explanation, and analysis of the aftermath in postwar Germany, especially in terms of the "human terrain." The book examines not only how the citizens of Kassel and Magdeburg chose to remember their respective nights of destruction but also why their observances differed during the Cold War—and how those observances largely converged in content and form following the end of that conflict.

I must admit, however, that this book can be bit of a slog. It just isn't for everyone because it is so dense. The exhaustive research rests on a foundation of original German texts, including personal accounts and correspondence. Author Jörg Arnold's presentation is well organized and logical, and he does a superb job of remaining apolitical. He presents the facts, interprets them dispassionately, and allows conclusions to emerge from the interpretive analysis.

Someone interested in the formulation or execution of a campaign, operational art, or tactics will not find much here. The text offers no analysis of the extent of destruction caused by tons of ordnance, the accuracy or efficiency of its delivery, or tactics employed by offensive bombers in the air and defenders on the ground. It does, however, provide lessons to be learned about the very long term effects of warfare that results in genuine devastation—the modern equivalent of razing a city and leaving it without one stone on top of another in smoking ruins. Arnold mentions the direct effects of a bombing-induced firestorm only to set the context for the human experience. For example, he does not dwell upon the fact that many victims died as a result of asphyxiation in otherwise "safe" bomb shelters due to the depletion of oxygen in the environment caused by the firestorm. He does, however, reveal that a window of opportunity for escape existed between arrival of the "pathfinder" target markers and the heavy bombers that delivered their deadly mix of explosives and incendiaries. The resentment expressed by those who lost loved ones toward air raid wardens who escaped during that window rather than staying with the victims or leading them safely away from the city is this author's grist for the mill. It is exactly this perspective that makes his book unique.

Arnold masterfully compares the "trajectories" of Kassel and Magdeburg—two cities devastated by Allied bombing. His choice is anything but random because their experiences were significantly different. Destroyed roughly in the middle of the war, Kassel became part of the Federal Republic of Germany during the Cold War. Destroyed only a few weeks before Dresden and less than four months before VE Day, Magdeburg became part of the German Democratic Republic. The common link between the two cities was overnight destruction from the air. The differences began with the changing context of the war—at a tipping point when Kas-

sel was devastated and in the waning days when Magdeburg was destroyed—and continued to diverge during the Cold War. These differing contexts shaped the way the cities remembered their losses, the meanings attached to those losses, and the way they framed a context to help understand their respective nights of destruction.

Readers who wish to understand issues and attitudes of the Cold War, especially from a Central European perspective, should read this book.

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Clausewitz's Timeless Trinity: A Framework for Modern War by Colin M. Fleming. Ashgate Publishing Company (http://www.ashgate.com), 110 Cherry Street, Suite 3-1, Burlington, Vermont 05401-3818, 2013, 218 pages, $98.96 (hardcover), ISBN 978-1-4094-4287-5.

With the rise in prominence and lethality of nonstate war, many people have called into question the continued relevance of Carl von Clausewitz to modern war theory. They do so because his trinity of the people, military, and government is best applied in state models but meets with more difficulty when one considers most of the recent nonstate and ethnically or religiously based conflicts like those in Iraq, Afghanistan, Syria, or even Libya. *Clausewitz's Timeless Trinity* attempts to reestablish the applicability of the trinity by focusing on his true trinity of passion, chance, and reason. More importantly, it elevates the importance of reason based on Clausewitz's best known dictum that "war is a continuation of politics" (*On War*, ed. and trans. Michael Howard and Peter Paret [Princeton, NJ: Princeton University Press, 1976], 7). The fact that the book validates its assertions by comparing the theory analysis to the conflicts of the former Yugoslavia (1991–95) makes it unique and enjoyable.

The first one-third of the text reads like an homage to Clausewitz, providing a thorough review of its two principal concepts—namely, the trinitarian idea and the argument regarding politics. Author Colin Fleming points out the inherent contradiction between the continuation of politics and the trinity, which treats politics/reason as only one of three roughly equal elements of war. Following this basic explanation, he thoroughly reviews the leading authors on this subject and their theories, leaving the reader feeling properly indoctrinated and able to form an opinion and evaluate the empirical examples that are the basis for the rest of the book. Fleming comes to the reasonable conclusion that politics take primacy and must be properly linked to the strategy of war if one wishes to attain victory; he also acknowledges that the Clausewitzian trinity properly describes the nature and conduct of war, which will directly influence politics but must remain subservient to it. From here, the book proceeds with an analysis of the Yugoslavia wars to prove its assertion empirically.

The remainder offers solid analysis of the wars but seems repetitive and narrowly focused on its examples rather than concentrating on a broad-reaching evaluation of a complex and multilayered conflict. Chapter 3, "Hostility," adequately supports the view that, at their heart, the Yugoslavia conflicts were less about ethnic hatred than about the politics of power and national gain. It also recognizes the vital importance of passion in a conflict and how it can not only be harnessed to inspire a group to victory but also grow out of control and produce unintended consequences. In chapter 4, " 'Chance and Uncertainty,' " Fleming addresses the uncertain, complex nature of the conflict, the ability of the three sides to leverage those circumstances to their best advantage, and the ways they were used against them. However, the book lacks any discussion of how chance, as a concept of random

events or disproportionate response, changed the nature of the conflicts and forced unpredictable outcomes or reversals of fortune. The final chapter, "Policy," expertly demonstrates the primacy of politics on conflict and the complex interaction of policy as it influences and is influenced by the conduct of war. This chapter will prove helpful to any military commander who bemoans the government's constantly shifting political goals that seem to characterize modern war. Sadly, it concentrates exclusively on the mostly state entities involved in the conflicts (Croatia, Serbia, and the Bosnian Muslims). The chapter ignores the multitude of nonstate actors that don't fall into traditional definitions of politics but have been key elements in the fighting in Iraq and Afghanistan. This omission leaves unfulfilled the empirical proof that Clausewitz remains applicable to the nonstate, ideology-based conflicts of the last decade.

Overall, *Clausewitz's Timeless Trinity* offers a scholarly and well-thought-out interpretation of Clausewitz that would benefit any creator or executor of national military strategy or operations. By looking at the older and less controversial conflicts in the former Yugoslavia, Fleming gives the reader a dispassionate and poignant empirical example of the primacy of politics in all wars while equally displaying the effect of each element of the trinity. Although this analysis did not necessarily prove the relevance of Clausewitz to nonstate-dominated conflicts, I heartily encourage the author to expand his writings on this topic by using the wars in Iraq, Afghanistan, or possibly Syria as the empirical case.

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Anti-Access Warfare: Countering A2/AD Strategies by Sam J. Tangredi. Naval Institute Press (http://www.usni.org/navalinstitutepress), 291 Wood Road, Annapolis, Maryland 21402, 2013, 320 pages, $47.95 (hardcover), ISBN 9781612511863.

In *Anti-Access Warfare*, Sam Tangredi analyzes why this strategy is favored by certain countries, how they intend to implement it, and what the United States could do to mitigate or, better yet, deter the threats posed. He begins where he ends, looking at history and pointing out that antiaccess (A2) strategies are nothing new, having been successfully employed more than 2,000 years ago. Indeed, Greece was saved from the peril of Persian invasion in 480 BC by the fact that Xerxes, the Persian king, could not consolidate his costly victory at Thermopylae due to the subsequent loss at sea in the pivotal Battle of Salamis, which effectively denied Xerxes the maritime logistical support required to keep his massive land force supplied. The tyranny of distance meant that waterborne resupply was essential for his deployed force, but the Greek triumph over Persian naval forces meant that adequate resupply of his massive army was a virtual impossibility. Hence, Xerxes postponed and later cancelled his anticipated invasion of the Peloponnese. Early on, Themistocles, the Greek admiral who would dismantle the Persian fleet, realized that sea power could be wielded with great effect to defeat forces on land. Despite the fact that Greek naval forces were considerably smaller than the enemy's, he adroitly leveraged geography, better training, and better intelligence to defeat the Persian fleet. This, in itself, is no great revelation. But Tangredi goes further, admirably highlighting five fundamental considerations by which to assess a given A2 / area denial (AD) threat and its prospects for success:

1. A perception of strategic superiority by the attacking force
2. The primacy of geography with regard to time and attrition

3. The predominance of the maritime domain as conflict space
4. The criticality of information, intelligence, and deception
5. The impact of events outside the conflict area

The importance of the *perception of strategic superiority* stems from the actions it generates (or deters). A perception of weakness often compels a channeling of effort into A2 measures rather than reflexively trying to counter the stronger side. That said, if the strategically superior force is vigilant about ensuring continued access to a region, it can deter inclinations to preemptively strike in hopes of presenting the stronger power with a fait accompli situation it would be loath to attempt to reverse. As for *the primacy of geography*, the weaker opponent, lacking true power-projection capabilities and having more circumscribed objectives and narrower interests, naturally attempts to minimize the capabilities gap. This adversary capitalizes on its proximity to the conflict area in terms of response time and readily available, albeit less sophisticated, resources. Tangredi spends considerable time emphasizing that even if the conflict is fought primarily in the air or on the ground, as was the case in Iraq in 1991, *the maritime domain* (including the air above and depths below) *is central to success*. The preponderance of assets brought to the fight will get there via oceanic movement, and sustainment will come largely from the sea. This maritime force obliges the other side to prepare and maintain opposing forces, operating offshore without concern for basing rights; furthermore, this power—particularly aircraft carriers—is more secure because it is mobile (as opposed to fixed landing strips in other countries). The author also stresses the importance of joint doctrine, interoperability, and collaboration in force-structure acquisition, specifically examining the synergy of the forces pitted against one another. Finally, he addresses *the determinative power of unrelated events in regions outside the area of conflict* and their impact on success or failure of the A2 strategy. For example, in the case of Xerxes and the Greeks, the latter's control of the sea lines of communication, coupled with perceived instability within the Persian Empire itself, compelled Xerxes to call off his planned invasion. Lacking command of the sea, Xerxes felt he could not attack without unacceptable cost and risk to higher priorities within his empire.

Tangredi dabs the historical palette, detailing three A2 victories followed by three defeats that are both illustrative and interesting, employing them as a springboard to discuss contemporary problems posed by China, Iran, North Korea, and Russia. In this reviewer's opinion, the North Korean and Russian scenarios stretched his framework a bit too much. He concludes with several recommendations, challenging critics who might debase his historical approach as antiquated and chafing under what he sees as a prevalent, technology-driven, and dogmatic approach to addressing the A2 threat.

Tangredi is to be commended for his straight-talking, no-nonsense prose and his unapologetically provocative style. He delivers a real body blow to advocates of "transformation" who take things too far, and he correctly exclaims, "What has beaten counter anti-access efforts is not weapons or technological advancements or innovative tactics. Rather, it has been a wavering of the out-of-area state's commitment to the operation owing to a concern for extrinsic events" (p. 234).

Taking a page from the Battle of Britain, the author also does a splendid job of reminding readers that technology is rarely a decisive factor in the A2 struggle between foes. Radar gave the British a key advantage, but the Germans misunderstood its importance to the overall A2 network. In fact, a more debilitating factor for the Germans was their continued faith in the cryptologic technology that had already failed them. The effective dissemination of signals intelligence to commanders in the field and the skillful use of double agents by

the British represented operational brilliance rather than advances in technology. Recall that the Germans, with the notable exception of nuclear weapons, made the most stunning advances in military technology during that war.

Although one can fathom a nautical bias within Tangredi's writing, it isn't distracting enough to wave folks off from this timely work. Crystallizing many choices that will have to be made in coming years, *Anti-Access Warfare* represents a valuable contribution to the A2/AD literature.

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Holloman Air Force Base, Images of America, by Joseph T. Page II. Arcadia Publishing (http://arcadiapublishing.com), 420 Wando Park Boulevard, Mount Pleasant, South Carolina 29464, 2012, 128 pages, $21.99 (softcover), ISBN 978-0-7385-9528-3.

Holloman Air Force Base (AFB), New Mexico, is a deserving subject for Arcadia Publishing's Images of America series. It features plenty of vintage photographs with explanatory captions and enough text to put everything into context. In *Holloman Air Force Base*, author Joseph Page does just that, inspired by his experience there. Chapters include "The Premodern Era, 1500–1942," "Alamogordo Army Airfield, 1942–1947," "'We Develop Missiles, Not Air!,' 1948–1970," "TAC to the Future, 1970–1990," and "Nighthawk Nesting Ground, 1990–2000." The author also provides a decent bibliography for readers who want to dig deeper into Holloman's past.

I view the third chapter, "We Develop Missiles, Not Air!," as the most important in the book because it considers the accomplishments and built environment (buildings and structures) of Holloman AFB. As a training base during World War II, Holloman (then Alamogordo Army Airfield) was one of many, as was the case when it served as a Tactical Air Command fighter base. Because Holloman's uniqueness lies in its legacy of missile and space work, I was disappointed that its "glory days" occupy slightly less than half of the book. Coverage of test programs is thorough, including photos of the legendary high-speed test track and highlighting one of Lt Col John P. Stapp's rocket-sled rides. Capt Joseph W. Kittinger II is shown in several photographs of his research balloon. Some subjects, such as Phyllis the baby chimpanzee and the Project Moby Dick balloons, receive multiple pages of photographs; unfortunately, many of Holloman's blockhouses, test stands, and other unique features are absent. The author presents an image of a sign pointing to the Able 51 launch site (p. 50) but not one of the site itself. Similarly, the book offers a photo of the JB-2 Loon (p. 32) but omits the fascinating launch ramp. In general, I found *Holloman Air Force Base* a bit heavy on human-interest photos and shy on those of significant structures.

Minor editorial glitches occur throughout. We read that at the end of the 1990s, Holloman was "home of the world's only stealth aircraft" (p. 8), which may come as a surprise to those who crewed B-2 stealth bombers at Whiteman AFB, Missouri, during that time. In the midst of the Cold War story, and without explanation, a photo depicts the gentleman who initiated construction on the base in 1942 (p. 81). The author offers a photograph of a rocket sled at rest on the test track, attached cables coiled across the track itself; the caption describes the sled "hurtl[ing] along the track" (p. 95). Furthermore, we read that "the diminishing of the tactical missile test mission at Holloman in the late 1960s was driven by political reasons—missiles were increasing in range and sophistication, requiring larger developmental testing areas" (p. 99). Those reasons sound technical and geographical, not political. These hiccups,

however, should not deter a reader from enjoying the book but suggest caution in quoting it as a reference source. Toward the end, a few photographs stray from Holloman AFB to undisclosed locations in the Middle East (pp. 109 and 111) and to Burbank, California (p. 112). At this point, the focus drifts a bit from the base itself to details of its assigned units.

For Airmen unfamiliar with missile development during the Cold War, *Holloman Air Force Base* provides an introductory taste that may whet their appetite to learn more. On the one hand, readers interested in the built environment of the base may be a bit disappointed in the photos selected. On the other hand, those from the Alamogordo area—or readers whose relatives served at the base—may appreciate the mix that Page has chosen.

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The Story: An Autobiography by James B. Story. CreateSpace Independent Publishing Platform (https://www.createspace.com/), 4900 LaCross Road, North Charleston, South Carolina 29406, 2011, 209 pages, $16.00 (softcover), ISBN 9781466428102.

This autobiography details the life and career of James B. Story, a bomber pilot from Winfield, Kansas, from his initial flying training and subsequent World War II service in the Pacific to his retirement following a tour in Vietnam. The main text is a detailed account, recorded in Story's private journal, of his wartime experience flying missions over the Solomon islands and Coral Sea as a lieutenant. With the authority of one who has "been there," he candidly recounts what it was like flying with Jimmy Doolittle Jr. and a host of other brave young men in twin-engine B-26s and, later, B-25 bombers.

Their unit, the 69th Bomb Squadron, prosecuted torpedo and skip-bombing missions throughout New Caledonia and New Hebrides, engaging Japanese submarines and surface combatants. Flying was hazardous business, from enemy action to mechanical problems. In addition to antiaircraft fire, Story and his companions suffered almost nightly sleep deprivation from "Washing Machine Charlie" (p. 73), their nickname for enemy air raids, often delivered in three or four waves in a single night.

Knitted throughout this wartime diary, Story relays timeless lessons about deployed service, including the trials of bedding down aircraft, men, and equipment and the establishment of expedient billeting, messing, and operations and maintenance facilities. Amidst his description of various missions, Story skillfully weaves a tale of the simple pleasures of life during war, such as mail from home, the availability of fresh food, and the occasional reel-to-reel movie.

Following his Pacific theater experience, he spends the remainder of the book detailing his many and varied post–World War II assignments, including test program work at Edwards AFB, California; accident investigation work at Norton AFB, California; and several assignments in Europe. In contrast to the practice of Air Force safety culture today, Story openly shares several experiences that simply would not pass muster, such as a particular tour at Hurlburt Field, Florida, in the late 1950s. There, he and a fellow captain trained three squadrons' worth of B-66 pilots in the Air Force's newest bomber. Since no two-seat trainers were available, they fashioned makeshift instructor pilot seats for themselves out of bomb-fin shipping containers that they dubbed the "AM-1 milk can." Story subtly acknowledges the unorthodox nature of this locally developed solution, ending simply with "we had no accidents" (p. 142).

Even with the occasional departure from operating by the book, this autobiography is both relevant and worthwhile, especially for students of airpower history in its raw, uncut form. A quick and enjoyable read, *The Story* will appeal to Airmen of all walks who seek insight into the World War II era and early days of the Air Force.

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The Bolt from the Blue: Air Power in the Cycle of Strategies by Dr. Sanu Kainikara. Royal Australian Air Force Air Power Development Centre (http://airpower.airforce.gov.au/Publications/Details/554/The-Bolt-from-the-Blue.aspx), F3-GF, P.O. Box 7932, Department of Defence, Canberra BC ACT 2610, Australia, 2013, 127 pages, $10.00 (softcover), ISBN 978-1-92080-094-9. Available as a free download from the Air Power Development Centre's website.

In *The Bolt from the Blue: Air Power in the Cycle of Strategies*, Dr. Sanu Kainikara presents a twofold thesis: "that there is an indelible connection between the four strategies [influence and shape, deterrence, coercion, and punishment] and the spectrum of conflict; and . . . that the strategies are not linear progressions . . . but that the spread is cyclical" (p. 11). In other words, the spectrum of violence is not a line as often depicted, with humanitarian assistance on one end and total war on the other, but a circle with war termination immediately linked to postconflict stabilization, and the cycle continues.

In explaining his argument, Kainikara ably illustrates airpower's unique value in providing policy makers a relatively precise, scalable instrument of power with an important, nonkinetic, "soft power" dimension. Adapting the familiar linear spectrum of violence, Kainikara's continuous circle—or cycle of strategies—captures Carl von Clausewitz's subtitle "In War the Result Is Never Final" (*On War*, ed. and trans. Michael Howard and Peter Paret [Princeton, NJ: Princeton University Press, 1989], 80). In his concise yet thorough explanation of influence and shaping strategies, deterrence, coercion, and punishment, readers will find many similarities with the works of Colin S. Gray, Daniel Byman, Robert Pape, and Phillip S. Meilinger. This is not a criticism; Kainikara synthesizes contemporary airpower theories effectively and adds nuanced observations. His chapter on influence and shaping strategy offers an example. Kainikara not only succinctly describes concepts of spheres of influence, strategic influence, and shaping the environment but also highlights airpower's strategic contribution. He explores its ability to apply nonlethal force by monitoring, its provision of physical assistance and intervention through airlift, and its active policing and stabilization through intelligence, surveillance, and reconnaissance. With similar conceptual development, Kainikara examines airpower's impact on deterrence, coercion, and punishment strategies.

A former fighter pilot, retired Indian Air Force wing commander, and holder of a PhD from the University of Adelaide, Sanu Kainikara currently serves as an airpower strategist at Australia's Air Power Development Centre. His unique background offers a valuable international perspective on and appreciation for non-Western airpower experience. Intended as a general theory of airpower, *The Bolt from the Blue* presents a slim bibliography and few references for the scholar although the general reader may appreciate its brevity and focus. Along the same lines, Kainikara supplies few historical examples or case studies but includes clear, effective diagrams to amplify his text.

To a certain extent, the author's great strength—devising a simple yet thoughtful general theory of airpower as an instrument of strategy—also portrays the book's greatest weakness.

In sum, the cycle-of-strategies concept presents a strategic vision largely devoid of the fog and friction of war. To be fair, Kainikara carefully qualifies his theory and warns of the unexpected, but the book's overall tone conveys airpower as a precise, orderly instrument that serves calculated strategic designs. Overshadowed is the mess of unknowns and the chaos that dominates the real world—as featured live and in real time on global media. Nevertheless, Sanu Kainikara's *The Bolt from the Blue* represents a useful, concise tool for teaching airpower theory. Carefully written, elegantly argued, broad in scope, yet nuanced and detailed, this work deserves consideration as one of today's premier expressions of airpower's influence on strategy.

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Arguments That Count: Physics, Computing, and Missile Defense, 1949–2012 by Rebecca Slayton. MIT Press (http://mitpress.mit.edu), One Rogers Street, Cambridge, Massachusetts 02142-1209, 2013, 272 pages, $35.00 (hardcover), ISBN 978-0-26201-944-6.

Dr. Rebecca Slayton's treatise *Arguments That Count* offers an in-depth look at systems-engineering issues that arose early during the Cold War when missile defense became a national imperative: the fact that computers are complex and that it takes time to program and work the kinks out. Dr. Slayton's background began in physical chemistry, but her take on the missile defense debate within the scope of technology that defines the system is well thought out and expertly researched. She does not play the role of defense-policy wonk in her writing. From this reader's point of view, the book does not contain an obvious agenda that either supports or castigates missile defense. The evidentiary support pulled by the author throughout the last five decades, however, shows the requisite level of criticism needed for the amorphous "missile defense" system, ranging from the nuclear-tipped Nike-X missiles and the Safeguard system to the Gulf War Patriots and today's National Missile Defense interceptors. Early in the introduction, Dr. Slayton asks a resounding question: "If complex software poses such obvious risks, why does the United States continue to rely so heavily upon complex weapon systems, rushing untested technology into the field?" (p. 2). Why, indeed?

Slayton provides a compelling argument as a secondary thesis—that computer engineering and practitioners of the "black art" be held accountable to the men and women whom their software attempts to protect. The text cites many examples of failures, the most recent being those of the Patriot missile batteries during Operation Iraqi Freedom. Problems with identification, friend or foe during that operation caused the shoot-down of two aircraft and the death of three aviators. Issues with software complexity in highly automated systems had been a common concern among developers since the early days with the Air Force's semi-automatic ground environment (SAGE).

The author details how designers had virtually ignored the information-processing aspect of the system. Manpower shortages within the halls of IBM caused a horrendous lack of planning forethought in the programming design. Gen Bernard Schriever's industrial-engineering revolution of "concurrency" failed to meet expectations in SAGE's software world where "each computer and system grew more complex than its predecessor, yet there was no time to complete [testing] . . . before beginning work on the next [revision]" (p. 29).

The Presidential Scientific Advisory Council, led by Dr. Jerome Wiesner, gave a wholehearted "thumbs-up" to the Nike-Zeus interceptor system, stating that the "system appears

to have been well designed from a data processing point of view" (p. 57). Slayton recounts that no mention of computing aspects in the missile defense architecture occurred *for over a decade* afterwards. One unintended effect from the institutionalization of software engineering within the Department of Defense, independent of the missile defense threat, is the shift of understanding from decision makers who know little about software and its complex development cycles to "laypersons" who believe they understand the problem set.

Regarding any drawbacks to the book, the subtitle's inclusion of the word *physics* seems a bit misleading. The text effectively frames the importance of complex software development for critical national defense systems but fails to deliver on criticism of the physical aspect. As a space operator, this reader realizes that they are intertwined. In terms of the physics aspect of the book, perhaps Dr. Slayton followed the advice of Richard Garwin, a critic of the Strategic Defense Initiative and senior scientist at IBM: "The systems would fail for physical reasons, so why should I waste my time on software?" (p. 6).

The shortcoming of mildly ignoring the physics aspect is that billions of dollars of taxpayer money have been spent on missile defense by decision makers who believe that a defense is possible. Full analysis of the physics element, along with the computer engineering, may draw a few more believers toward the reality of missile defense. The limited scope of the argument, perhaps, nullified the need for a discussion of physics.

A short read with 98 pages of references, the book offers a historical view of the computer-engineering problems required by complex systems—and therein lies its greatest value. Space and cyber operators as well as acquisition professionals should read *Arguments That Count* for the knowledge that all complex systems have inherent problems and that by *learning* lessons from the past, we can overcome these obstacles.

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Marketing the Moon: The Selling of the Apollo Lunar Program by David Meerman Scott and Richard Jurek. MIT Press (http://mitpress.mit.edu), One Rogers Street, Cambridge, Massachusetts 02142-1209, 2014, 144 pages, $39.95 (hardcover), ISBN 978-0-262-02696-3.

The striking image on the cover of *Marketing the Moon: The Selling of the Apollo Lunar Program* is of the moon wrapped in the American flag. In the style of modernist propaganda bordering on postmodernist parody, Old Glory is draped over half of the lunar disc, dwarfing a tiny Apollo lunar module sitting on an uncovered portion of the gray surface. One might expect from this illustration, actually taken from Philco-Ford's Apollo-era promotional material, that the book's authors would present a cynical view of the National Aeronautics and Space Administration (NASA), industry, and the media's "selling" of the program that won the space race in 1969 by landing humans on the moon for the first time. However, this is not a history written by cynics but by admirers and true believers in the cause.

Authors David Meerman Scott and Richard Jurek are professional marketers who also happen to be space enthusiasts. Their passion and expertise make *Marketing the Moon* a worthwhile and entertaining read. According to their biographies, Scott "is thought to be the only person in the world with a lunar module descent engine thrust chamber in his living room," and Jurek claims "the world's largest collection of $2 bills that have flown in space." They describe the Apollo program, which arose from President Kennedy's 1961 challenge

for the United States to land astronauts on the moon before the end of that decade, as "the largest, and we believe the most important, marketing and public relations case study in history" (p. ix).

Scott and Jurek recount how an unprecedented—and not since repeated—level of cooperation among the US government, private contractors, and the media sustained a successful campaign to promote American space exploration throughout NASA's Mercury, Gemini, and Apollo manned-spaceflight programs. Interestingly, the marketing of these accomplishments was by no means a fully coordinated effort from the top down, given that NASA's public relations (PR) arm was never sufficiently staffed or equipped to handle the public's vast demand for information. Instead, it is revealed that a successful PR campaign emerged organically, largely as the result of key decisions by NASA officials favoring openness and objectivity in the dissemination of information by government representatives. The civilian space agency's marketing strategy, which stood in stark contrast to the secrecy and propaganda surrounding the Soviet Union's space endeavors, also encountered resistance from the Cold War–era US military establishment that had exercised much greater control of information about space feats before NASA's founding in 1958. Meanwhile, the myriad private companies contributing technologies to space program contracts sought to sell other products to both the government and the masses through creative Apollo-themed advertising campaigns and elaborate lunar-mission press kits. Completing the triad were the overwhelmingly supportive media outlets and individual reporters hoping to deliver the definitive account of what most of them perceived as the story of a lifetime.

Just as the original story of the moon landings was conveyed through visuals, so do Scott and Jurek share the marketing history by including photographs on practically every page. Yet, *Marketing the Moon* is much more than a coffee-table book. It offers plenty of narrative with historical substance, relying on thoroughly cited source material including the authors' personal interviews with astronauts and other NASA and industry personnel from the Apollo era. The PR campaign surrounding the Apollo program is described as evolving in the context of the political, technological, and social changes that defined the 1960s.

A central theme of Scott and Jurek's work is that the marketing of America's lunar program would ultimately fall victim to its own success. In a compelling early chapter, the authors attribute this success to the American public's fascination with depictions of space travel from science fiction literature as well as Hollywood productions throughout the early twentieth century. These portrayals were themselves informed by the space voyages imagined in nineteenth-century literature, most notably by Jules Verne in *From the Earth to the Moon.* After the Soviet Union launched Sputnik in 1957, the US government, industry, and media had a rich space tradition to tap into as they promoted America's goals for the decade to come. Yet, exciting as it was for half a billion people worldwide to witness Verne's dream realized live on television when astronauts Neil Armstrong and Buzz Aldrin walked on the moon in 1969, actual space travel could never quite compete with the fantasy that inspired it.

The authors note the "growing sense of apathy about the manned lunar program as the general public became aware that the realities of spaceflight differed greatly from the romanticized versions envisioned in magazines, books, and on cinema screens"
(p. 5). This observation is crucial, considering that the marketing of America's missions to the moon was arguably the most important aspect of the entire undertaking. At the height of a Cold War rooted in competing ideologies, America's eventual triumph in the space race, as well as its transparency in broadcasting to a global audience both its successes and failures along the way, showcased the superiority of free societies over their totalitarian counterparts. Not surprisingly, once the *Apollo 11* mission fulfilled President Kennedy's challenge, a sharp decline occurred in

media coverage, public interest, and financial support pertaining to human exploration of the moon. Appropriately, the book's foreword is written by *Apollo 17* astronaut Gene Cernan, who in 1972 became the last man to walk on the moon. The planned *Apollo 18, 19,* and *20* missions were canceled as Americans shifted their attention back to earthly matters.

Marketing the Moon delivers an intriguing study of the intersections among government, industry, and the press. Undoubtedly, this topic is relevant to anyone in the military profession. Furthermore, Scott and Jurek's description of the media's reporting on the Apollo program should appeal to a younger audience of space buffs who did not have the chance to experience the moon landings in real time. The book even offers a fresh, behind-the-scenes perspective for those who lived through that significant period in history.

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