Personal Theories of Power

Exploring Strategy Through the Eyes of Emerging Leaders

The Bridge & CIMSEC Compendium

Edited by:

Nathan Finney

Richard Ganske

Mikhail Grinberg

Tim Wolfe

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Introduction

When Richard Ganske first mentioned the idea of writing about personal theories of power and publishing them on [The Bridge](), I wasn't immediately on board. I thought it would be a niche product, mostly created by friends who would provide content more out of loyalty than an original idea on theory. I'm pleased to say that I could not have been more wrong. With Richard heading the concept, we quickly sketched out some possible topics people could cover. Air power and land power, of course…we could each cover those. We then started thinking about other that tended to inhabit the blogosphere and might be willing to produce some interesting ideas. We knew more than a few eloquent navalists, so sea power would likely be easily covered. They also provided us with a valuable link to another great blogging organization, the [Center for International Maritime Security](), which agreed to cross-post the articles and open up another avenue to a well-informed audience. With the "geographic" domains largely addressed, we shifted our approach; we invited writers we knew to write, allowing them to develop their own topics. Overall, this provided us sixteen possible posts. We expected to actually deliver four or five by the short deadline provided. Fourteen arrived for publication, including:

- Richard Ganske's opening salvo ["Theory Properly Constructed: A Starting Point for our Personal Theories of Power"]()
- Dave "Sugar" Lyle's ["The Cognitive Domain"]()
- Mikhail Grinberg's ["Defense Industrial Base: A path to achieving political objectives independently"]()
- Richard Ganske's ["Joint Action"]()
- Billy Pope's ["Cyber Power: Opportunity, Leverage, and Yet…Just Power"]()
- Adam Elkus' ["Social Choice: Preferences, Choices, and Strategy"]()
- Nate Finney's ["Land Power: More than Simply the Element of Decision"]()
- BJ Armstrong's ["Sea Power Matters: Bringing Balance to the Force"]()

- Brett Friedman's ["Amphibious Power: A Key Element in the Strategic Theory Canon"](#)
- An Anonymous Space Professional's ["Space Power: The Buttress of the Modern Military"](#)
- Nick Prime's ["A Personal Theory of Strategy: Politics, Power, Control. Theorising Strategy in the Cognitive and Physical Spheres"](#)
- Matt Hallex and Bruce Sugden's ["Nuclear Weapons: Thinking about Strategy and Nuclear Weapons"](#)
- Matt Hipple's ["Sea Power: The Power of Opportunity"](#)
- Richard Ganske's ["Air Power: Annihilation, Attrition, and Temporal Paralysis"](#)

And for those that are counting, Rich Ganske did provide 3 posts for this series (including his opening)…he was that committed. While the quantity of the posts was truly unexpected, the quality was what truly impressed me. The authors truly took the time to think through their desired topics and address their particular views on them; it probably didn't hurt that the authors were either in the midst of studying the topic or immersed in it from day to day.

What really made this project a success, at least in my mind, was the obvious enthusiasm and professionalism the participants displayed. How many people do you know would volunteer time out of their already busy schedules to study, write, edit, and format a piece on theory? How many people do you know would find not only value in such a pursuit, but excitement in the prospect? Could you call them out of the blue and make such a request?

Leveraging relationships, and even loose ties, is not new when it comes to accomplishing intellectual tasks. Last year an organization, the [Defense Entrepreneurs Forum](#), was created to leverage just such relationships to benefit our military services and those that serve in them. In a post-event [article](#), a few of the founding members addressed the topic of informal networks and their worth:

> *One solution [to the obstacles of creating] is to form informal networks outside formal organizational structures in which innovative thinking can occur. That can be as simple as a few friends drawing sketches on bar napkins or trying new tactics, techniques, and procedures on the training range. Over time, these ad hoc networks can push ideas back into formal channels. Military journals provide formalized but still peripheral networks in which innovators can inject fresh thinking into the mainstream.*

> *Sometimes these ad hoc networks take on a life of their own, relentlessly pushing new thinking on a stale organization. In some cases, the organization eventually recognizes their value and draws them in. Such was the case with the German General Gerhard von Scharnhorst, who was eventually entrusted with reforming the Prussian military after the disastrous battle at Jena. In addition to creating the professional military staff, Scharnhorst and his network acquainted the world with a promising Prussian officer named Carl von Clausewitz. In other cases, these networks of "Young Turks" are less welcome. Billy Mitchell was ultimately court-martialed for his intemperate advocacy of airpower in the interwar years. Fortunately for his fellow airmen, the development of airpower theory was able to continue through the 1930s in the Air Corps Tactical School, a formal structure that nonetheless had enough autonomy to stay under the radar. Although airpower still faced a painful learning curve in World War II, the pre-war activities of these loyal dissidents laid the groundwork for airpower to develop into a finely honed instrument of war.*

The same is true of the personal theories contained in this compendium; others may have previously addressed all of the topics we published in this series…and in far greater detail than the 1,500 words with which I constrained our authors, but the value of each of us delving into our own personal views is that it started a conversation. By doing so, it created more relationships to sharpen the theory, improve the argument, and hopefully strengthen the ability for application.

Based on the feedback I've received so far for many of the posts, that conversation is happening. Relationships are being built. Others are being encouraged to write their own theories or react to those they've read. I hope they

continue to drive the conversation and build even more relationships…and who knows, we may have to create a second compendium to cover the responses to those contained herein.

In addition to the great output provided by the authors, The Bridge was lucky to not only have the intellectual drive and editing provided by Rich Ganske for this project, but the encouragement, **advice**, and editing of Mikhail Grinberg, **and** the technical copy editing skills of Tim Wolfe. Without the work of many people, this series could not have occurred. If you'd like to join us on The Bridge, we're simply a note away.

Nathan K. **Finney**
Editor, *The Bridge*
Arlington, VA
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Theory Properly Constructed
A Starting Point for our Personal Theories of Power

Richard Ganske

When professionals hear the word theory, their eyes tend to glaze over. Most believe theory is purely academic. While understandable, this is only one view of theory. For those of us that will be sharing our personal theories of military power, theory frames our worldview. It changes how we approach problems. Theory shapes how we project power. Over the next couple of days, this will become blatantly apparent as you read how a broad range of national security professionals share their personal theories here on The Bridge. We are presenting our personal theories as a starting point for a wider and deeper national security and strategy discussion.

Theory is crucial to what we do, but it must be consciously acknowledged and tested. In his book *The Tacit Dimension*, Michael Polanyi suggests "we can know more than we can tell." This is a useful description of our theoretical beliefs as knowledge; where knowledge, in what is irrevocably lost through unrefined English, is best understood via differentiation in the German tongue as *Wissen* and *Können*.[i]

The former, *Wissen*, is knowledge of awareness; here our particular gestalt is the sum of our biases and blind spots. The latter, *Können*, is knowledge of discernment; here we typically tend to make order of things within our perception and sub-conscious. These coupled concepts build a bridge between the creative powers of the mind and a value judgment for ordering of the operations of perception. For both these reasons, there is value in the expression of our personal theories. They expose buried subceptions, but are also practical extensions in reproductive and productive reasoning.[ii] Bringing these to the fore is the purpose of The Bridge's efforts to gather the personal theories that follow this article: for narrow self-reflection, for wider public consideration, for

discussion, for questioning, for debate, for recursion, and ultimately for improved practical application. So as a prompt for our writers and readers alike, it is useful to consider the proper construction of theory at the outset of this endeavor.

The Five Functions of Theory and their Impact on Practice

"Strategy and strategies, theory and practice, must be seen as one," the eminent strategist and theorist Colin Gray suggests, and "[theory] should be able to help educate the realm of practice by assisting people to think strategically."[iii] There is a unifying nature of theory, in that it informs and educates professionals towards making sense of their circumstances. Towards that end, the archetypical theory has five functions: it defines, categorizes, explains, connects, and ideally, anticipates.[iv]

First, theory defines the field of study. In a sense, it provides via classification a clean break with what its users are considering and what they are not. Inherent in this classification are two additional considerations: definitions ideally should provide users a description of what is being done and illuminate the purpose of what is being done. [v]

Theory should provide users a description of what is being done and illuminate the purpose of what is being done

Second, theory must categorize its field of study into constituent parts, thus providing some form of typology, for example, differentiating between strategy and tactics, or limited and total war. Ideally, perhaps even scientifically, this typology requires the theorist to establish criteria of exhaustiveness and mutual exclusiveness. This is logical, even *purely* logical, if impossible. The curb of practicality must provide limits of such logic to the user of theory in favor of pragmatic reasoning. This pragmatic reasoning is what provides grammar to a particular theory. Thus, hopefully familiar to the reader: theory's logic *is not* its own—so as to provide consistency with its purpose—but its grammar in what it does *is* its own. This nature drives theory towards a healthy respect for empiricism rather than just glib idealism. This also means the categorization

of a theory is likely never final; it will remain eternally relevant for contemplation because of either new explanations or new grouping, or some combination of both.[vi]

Third, theory provides an explanation of occurrences, and this is theory's most important function. Harold Winton goes so far as to suggest, "explanation is the soul of theory." Here within theory is the convergence of both deductive and inductive examination of an object of study. Where the former is focused upon a theory's empirical testability, the latter is more intuitive and requires creativity to recognize a paradigm shift. While this is the most important aspect of theory, it is also the most transitory. This distinction from the transitory property of categorization results from a recursive flow of analysis and synthesis via observation, hypothesis, and testing.[vii]

Fourth, theory relates and connects together concepts. This part of theory progresses the conception of an object from an existential basis (inherent in the previous functions) to a form of relational construct. Without such a progression towards the latter, theory suffers from a pensiveness that precludes practical application. This relational aspect of theory applies order to things and, in other cases, also describes correlation, or even causation, and it can even be a probabilistic supposition. A familiar example of the relational concept in theory is the elegant Clausewitzian connection between violence and politics.[viii]

Finally, theory anticipates the future. Theory is more than naïve empiricism, which if followed would suggest that our practical application would only be the sum of our accumulated observations. Karl Popper disputes the idea of this aggregation of observations by reminding us that, "[we] do not 'have' an observation, but we 'make' an observation." Observation, then, is always preceded by something more *theoretical* that presupposes expectations for an object under consideration. Thus convinced that empiricism alone is insufficient, to what extent or limit would the prudent theorists extend their

judgment from propositions, hypotheses, principles or axioms, to even laws? The complexity of this issue is discussed elsewhere, but it is sufficient to say a theorist must not abandon empiricism either. For, if they do, it is rather axiomatic that theorists will find their theories are merely *visions*, which I.B. Holley describes as "ideas not systematically prepared for authentication," or *illusions* as "ideas that could not survive systematic preparation for authentication," or at worst as *myths* where "ideas… exempt themselves from any systematic authentication." Here it might be forgivable, falling short of being useful theorists to at least being compelling visionaries, but only the most maligned and rare theorist is caught in illusion- or myth-building.[ix]

Conclusion

Now that we've properly wrestled with the *Wissen* and *Können* aspects of theory construction, it's now time to set it out for review and challenge. "Questions are our best friends for the invention and refinement of strong useful theory, and they are the lethal enemies of poor theory," Colin Gray reminds us. Now it's time to put that idea to the test, ever mindful of the Master's aim for theory:

> *The primary purpose of any theory is to clarify concepts and ideas that have become, as it were, confused and entangled. Not until terms and concepts have been defined can one hope to make any progress in examining the question clearly and simply and expect the reader to share one's views.*[x]

We hope you enjoy the next few days as our authors explain, likely through their own intellectual struggles, their personal and particular theories, and we challenge you to respond with your questions, counter assertions, and your own personal theories.

Major Richard (Rich) Ganske is an Air Force officer, B-2 pilot, and weapons officer. He is currently assigned to the Army's Command and General Staff Officers Course at Fort Leavenworth. All views are his own. Follow him on Twitter: @richganske

The Cognitive Domain

Dave Lyle

Complementary mental models hold the social world together. It's not the lines painted on the road that keep us from careening into each other on the highway, as we sadly find out too often. Paper money has no intrinsic value on its own, unless you like the pictures and holograms, are trying to start a fire, need a bookmark, or have just run out of toilet paper. Online credit purchases do not even require the plastic card anymore, and only work because we collectively believe that strings of ones and zeros—stored electronically in computers that we'll never see—equal our right to receive services and things from other people, and keep them. In all of these cases, it's not about the symbolic artifact. Our agreements about what those artifacts represent, and our willingness to act on those beliefs, are what keep the wheels of society turning.

Our brains are hard wired to socialize; to find personal meaning in the groups we belong to and the groups we interact with. If there's a group, we instinctively figure out if we belong to it and what our place is in the pecking order. We usually try to maintain or improve our position in the hierarchy, even if it's only within a subgroup we identify with. And to do so, we simultaneously cooperate and compete with others, usually both at the same time.

If it's true that the plot of every story in the world can be reduced to trying to answer the question "Who am I?", then it speaks volumes about the importance of identity to human beings. In fact, our brains process things that we associate with our own identity in different ways than we process things that we see as being "other". We have a very hard time rationally questioning anything that becomes part of who or what we imagine ourselves to be.

But how do we know what is "us", and who or what is "other"?

We make up stories to set the boundaries. We *love* stories, and literally can't live socially without them. The basis of our shared mental models, we encode our stories in metaphors, in ceremonial rituals, in songs, in books and films, and in various physical artifacts that help us to remember and communicate both the stories and their meaning. We use the stories as guides for social interaction, and we rewrite them over time to incorporate new experiences. Stories help us understand where we've been, and set the direction for collective effort in the future. They are our guideposts for understanding and negotiating ever changing social landscapes, and for accepting our roles within them. Because we have stories, we have identity, we learn to specialize, and we learn to work together for mutual benefit, creating far better lives together than we could ever possibly experience separately.

And here's the real kicker. We only think we're in charge of what we believe, and that we deliberately control our own decisions through conscious, rational thought. What really happens is that a multitude of mental submodels—most of which we're not even aware of— compete for control of our conscious attention, and the domination of our decisions. The idea of unconscious thought influencing the conscious is nothing new— the Greeks were talking about it thousands of years ago. But what is new, as we learn more about the neurobiological foundations of our cognitive processes, is how little control we actually have over our own thoughts most of the time. "Gut feel" intuition usually trumps the pure, unbiased processes of reason that we like to credit ourselves for, but seldom employ in practice—but that's not always a bad thing. So how does this work inside the mind itself?

Heuristics—the "rules of thumb" built in our brains through combinations of conscious and unconscious encoding—are really combinations of associated and connected mental submodels that are called up in specific contexts. Formed from the bottom up over time, ideas and memory literally emerge from

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countless physical structures in our brain building and interacting through electrochemical processes. With billions of neurons in our brains, the combinatory possibilities of brain processes are even greater than the known numbers of stars in the universe. To add to the complexity, nature and nurture combine as co-creative forces, ensuring that no two brains are ever alike, even if the basic structures are similar. The true "Great Unknown" can be found in the space between our ears…

But the human mind isn't completely unknowable either. As Joseph Campbell observed, the same myths are constantly reinvented over the millennia because basic human nature—and the basic cognitive heuristics that form it—is universal across ages and cultures. An intuitive understanding of this has been the key to success for generations of generals, politicians, illusionists, and con artists, giving them the power to predict and shape human behavior. But now, through neuroscience and neurobiology, we're finally starting to better understand the underlying biochemical processes that were at work the whole time.

Imagine all of those competing mental submodels as if they were Lotto balls, tumbling around in the hopper of our brains, competing to be selected as the winning ball at the top of conscious attention. Now imagine that all of those balls are connected to the other balls in various ways by small, invisible strings, with different degrees of connection and strength. If you could grab specific balls and strings, in specific sequences, you'd have a better chance of influencing which balls make it to the top of the hopper to be selected. You may not know exactly which one will be the winner, but your odds of predicting it are much better if you know something about how those balls are connected together, and how they interact. It works the same way with interconnected memories, ideas, and feelings: "cognitive priming" activates specific mental heuristics at specific times, for better or for worse. The knowledge of identity stories—and the history of how they came to be—is crucial to building your own mental model of other people's mental models. It's

this "Theory of Mind" we use every day to negotiate and modify the heuristic driven social landscape, as we seek to shape it in ways that favor us.

Except it's not always that easy. Sometimes the stories don't match up. Sometimes we disagree about who is in our group, who gets to have what, who gets to tell others what to do, and what should happen if we disagree on these things. We try to define the boundaries with artifacts that evoke the stories. We write laws and codes. We wear uniforms, and issue IDS and badges. We buy power ties, $50,000 wristwatches, and $500,000 cars to cement our place in the social strata. Then we use these stories and artifacts to reinforce our place and our "rights" within the social system. We plead. We cajole. We flatter. We threaten. And finally, we fight.

We fight when our primitive brain senses that something is threatening our physical survival. We fight when something threatens our identity or place in the pecking order, and occasionally we fight over things peripheral to survival and identity that do not threaten the first two. We fight over fear, honor, and interest, as Thucydides observed, and we usually do it in that order. And when we fight, we often equate the ability to maim and kill as having power.

But killing really isn't the point when it comes to power. While it's true that killing someone else is a way to exercise power, and a way to prevent someone else from exerting power over you, power is much more about influencing their mental models of the people who you don't kill, in order to drive the continuing social interaction in directions that you favor. As Thomas Shelling once said, it's usually much more useful to have the ability to kill someone than it is to actually do it. And as he also said, it's the loser who determines when the fighting stops, not the winner.

So how does the loser accept the new reality? They rewrite their story in ways that rescue their personal and social identity. A temporary stability can be maintained under the threat of future sanction and violence, but when peace follows war, it happens because the stories of the victor and vanquished have become complementary enough that the loser can not only answer the "What am I?" question with

honor, but perhaps more importantly, "What can I become?" favorably under the new status quo.

Using knowledge of the basic human cognitive processes, and the stories that define people's identity—to take actions that convince others to change their stories, identities, and actions in ways that accommodate yours, accepting your story as their own in the ultimate exercise—is called POWER.

Lieutenant Colonel Dave "Sugar" Lyle is an Air Force officer, strategist, and PhD candidate at the Air University. All views are his own.

Defense Industrial Base
A path to achieving political objectives independently

Mikhail Grinberg

Defense industrial base [hereafter "industrial base" or "defense industry"] issues are almost always discussed in a contextual vacuum—as if their history begins with World War II factories or with President Eisenhower's 1961 warning of a growing industrial complex. But manufacturing materiel is as ancient as war itself. This essay attempts to first set a historical narrative for the defense industry and then to propose a theory of its power.

Marching through history

In 1528, Charles V of Spain hired a Genoese firm to supply and operate a fleet of galleys to help control the Italian coast. Due to their increased size and sophistication, the price of galleys grew. By 1570, this led his son Philip II to experiment with having court administrators operate seventy percent of Spain's fleet. They failed to recruit experienced oarsmen or to provision equipment efficiently. The price of operating galleys doubled without any vessel improvements before the policy was reversed to private enterprise.[i]

In 1603, Charles's grandson, Philip III paid 6.3 million ducats to Gonzalo Vaz Countinho, a private merchant, for 40 ships and 6,392 men. This eight year contract supplied Spain with its entire Atlantic fleet. Twenty-five years later, Philip IV contracted a Liège company to build cast-iron cannon and shot. By 1640, 1,171 canons and 250,000 shot were built. Until the end of the eighteenth century Spain was self-sufficient in iron guns.[ii]

Contracting was not limited to the House of Habsburg. Governments have always relied on industry to provide materiel. It is not surprising then that in Michael Howard's classic *War in European History* private enterprise plays a prominent role. Knights, mercenaries, merchants, and technologists shaped the history of Europe and thus its wars.[iii]

For centuries supply caravans traveled with armies and small, decentralized, enterprises such as blacksmiths were ubiquitous. To profit, merchants repurposed equipment on commercial markets. Other proprietors assumed financial loss for military titles or, when victorious, profited from the spoils of war.[iv]

The Thirty Years' War (1618-1648) changed the scale of conflict and the materiel required to conduct it. At last there were "large-scale profits to be made" from the "business of war".[v] In Genoa, Hamburg, and Amsterdam centers comprised of weapons manufacturers emerged alongside merchants that specialized in capital, financing, and market access. A multinational arms industry was born that "cut across not just national, but confessional, and indeed military boundaries."[vi]

Berlin based Splitgerber & Daum was one firm born from this system. Formed in 1712, its two proprietors began as commissioned agents. They raised capital to supply munitions first to local arsenals in Saxony and eventually the Prussian army itself. Their growth can be attributed to an early observation: that success in their business "could be achieved only within the framework of a strictly organized mercantilist economy."[vii] Patriotism became a marketing tool.

By 1722, Splitgerber & Daum was manufacturing "gun barrels, swords, daggers, and bayonets" at Spandau and assembling guns at Potsdam.[viii] By mid-century it was a conglomerate. Frederick the Great, unlike his grandfather the "mercenary king," was not an admirer of contractors. But after the Seven Years' War ended in 1763 he guaranteed the company a "regular flow of government orders" as long as it remained loyal to Prussian interests.[ix] He understood that in order to "raise Prussia to the

Figure 1: Interdependence in the International System*

status of great power required the services of merchants, manufacturers, and bankers."[x]

Pouvoirs régaliens

Twenty-six years later, the French Revolution would change Europe. Until then, states were the property of absolute sovereigns; after they became "instruments of powerful forces dedicated to such abstract concepts as Liberty, Nationality, or Revolution."[xi] As the nature of the State changed, so did its wars. French armies were now comprised of conscripts. In 1794, France attempted a planned economy. It reasoned that if people could be conscripted so could resources. The experiment failed due to inefficiency; manufacturing reverted back to private enterprise before the year's end.

Industry would flourish during the Napoleonic Wars. From 1783 to 1815 two thirds of Britain's naval tonnage was produced by private shipyards. And the Royal Navy began to experiment with managing industry. It sacrificed deals with large lower-cost providers to bolster small contractors that it considered to be more flexible. In the nineteenth century, the birth of nations launched state industries: private, but British shipyards; private, but German steelmakers.
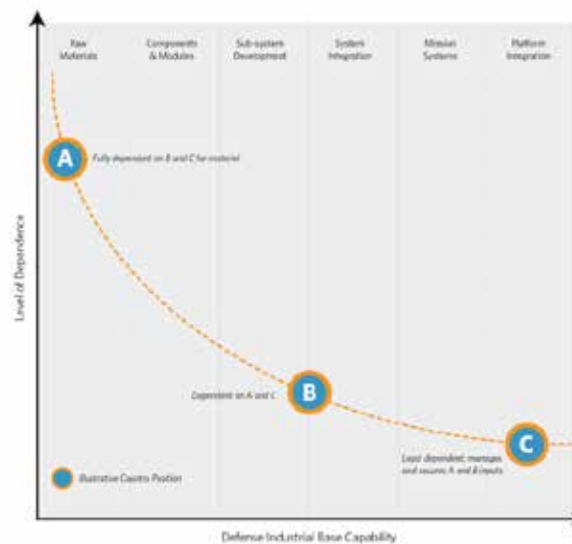
Krupp would embody this development. Founded in 1811 in Essen (by then Prussia), it would first develop steel. By 1851 it became the primary provider of Prussian arms and, after German unification, the country's preeminent defense firm. By 1902, Krupp managed the shipyards in Kiel, produced Nassau-class dreadnought armor, and employed 40,000 people.[xii]

Defense Industrial Base Power

Defense industries evolved from distributed providers, to unaligned enterprises, and finally to state-managed industries. They became consortiums

of private or government-owned entities that translate the natural, economic, and human capital resources of a state into materiel.[xiii]

World War II stretched this logic to its absolute; all state resources were translated into the machinery of war. In 1940 the US only built 2,900 bombers and fighters; by 1944 it built 74,000 on the back of industry. From 1941 until the war's end 2,711 Liberty ships were built; welded together from 250,000 parts, which were manufactured all over the country. And from 1942 to 1946, 49,324 Sherman tanks were built by 11 separate companies such as Ford and American Locomotive—built by the "arsenal of democracy."[xiv]

After the war, all countries began to balance national security objectives with resources via defense industrial base policies. A country's industrial base *capability* could be measured as a combination of its scope (how many different cross-domain technologies it could develop), scale (at what quantity), and quality (battlefield performance).

The path to independence

National resources limit capability. Less capable countries are more dependent on allies than more capable ones (Figure 1). As countries develop an industrial base their level of dependence decreases, but never goes away. This can be best understood through industry itself. Prime contractors rely on their supply chains. But a widget supplier is more dependent on its customer, than its customer is on it.

Industry developed a *science* for managing the inherent risk of dependence—supply chain management. However, corporate practices do not translate to international politics. Country A may find new allies; Country B may seek to act on its own. And all countries shift along the curve depending on their level of investment.
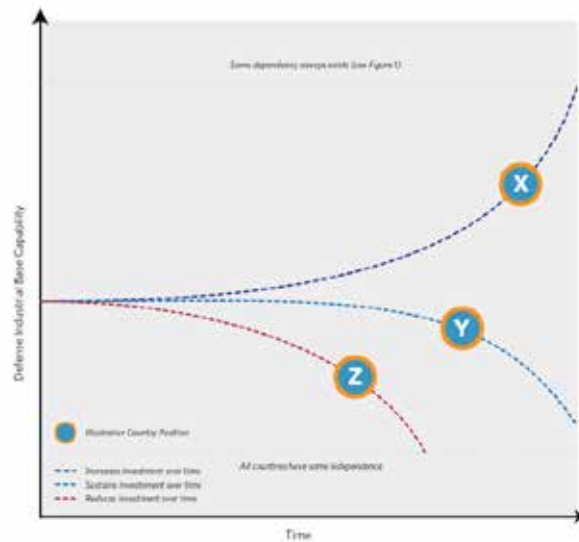

Figure 2: Ability to Achieve Political Objectives Over Time

For example, Saudi Arabia and the United Arab Emirates have invested into defense since the first Gulf War. They are now capable of "manufacturing and modernizing military vehicles, communication systems, aerial drones, and more."[xv] Through offset agreements and foreign partnerships they have acquired "advanced defense industrial knowledge and technology" and are expected to rely on their "own manpower and arms production capabilities to address national security needs" by 2030.[xvi]

To borrow from Henry John Temple—Britain's Prime Minister from 1859 to 1865—in the international system, states have temporary friends, but permanent interests.[xvii] Over time, it is thus in the interest of each country to increase its independence by investing into defense capabilities (Figure 2).

Without such investment, Country Z capabilities erode. Country Y may attempt to sustain its capabilities, but as other countries develop new technologies, sustainment also leads to capability erosion. Only countries that invest into industrial bases over time are able to achieve political objectives independently.

One more supper

The United States has never shown, over a sustained period of time, "a coherent long-term strategy for maintaining a healthy domestic defense industry."[xviii] American defense budgets are cyclical; they have contracted after every war. Every time, the Pentagon intervened with reactionary strategies to manage industry. And each time, as one former Deputy Assistant Secretary of Defense noted, the Pentagon got it wrong.[xix]

This was most evident in 1993 when the Pentagon held a dinner, known as the "Last Supper," with top defense executives. It told them that after the Cold War, America no longer needed nor could it afford the same volume of materiel. But it left it up to

industry to decide its overcapacity problem. Industry began to consolidate, based on rational business sense, but not a national strategy.

The 1990s were focused on consolidation, commercialization, and dual-use technology. Today, as budgets are again tightened, new strategies such as increased competition and international expansion have emerged. This may help save some companies, but how will it impact our ability to act independently over time?

In 2003, after decades of following a similar industrial base approach, the UK realized that it no longer had the design expertise to complete development of its *Astute-class* nuclear submarine.[xx] And in 2010 the UK's *Strategic Defence and Security Review*, by listing the capabilities it *will* have, spelled out what it can no longer accomplish independently. Although the UK received American support for its submarine, what would happen if it did not?

As the US argues over budgets or program cuts, a theory of defense industrial base power could help set priorities. Commercial diversification or international expansion are *tactics* by which defense firms gain new revenues to save themselves in a downturn. We need a national defense industrial base strategy to maintain our capability for independent action

Mikhail Grinberg is an aerospace and defense consultant focused on strategy and mergers and acquisitions. All views are his own. Follow him on Twitter: @mbgrinberg

Joint Action

Richard Ganske

Despite the historical success of joint action, many professional warriors and strategists continually debate which military function is most decisive in the termination of war. Even today, some question whether it is indeed worth the effort to work through the complications of combining competing strategies into effective joint action. My personal theory of joint action proposes an artful blend of both sequential and cumulative strategies to conduct unified operations that most effectively achieve our national objectives. Strategic effect is reduced when either cumulative or sequential strategies are parochially subordinated to the other, since there is no single, decisive function, service, or role in war.

The Goldwater–Nichols Department of Defense Reorganization Act of 1986 drastically changed how the US military operates. Most importantly, it required the military services to interact jointly by force of law. This legal requirement for joint operations is necessary; but is by itself insufficient to build a compelling basis for joint collaboration, integration, and interdependence. While there has been much ink spilt over the normative force of Goldwater-Nichols, few have explored the theoretical basis for joint interdependence since Sir Julian Corbett.[i] This essay attempts to expand Corbett's theoretical foundation that gives the law its conceptual footing.

What is Jointness?

Joint action, or jointness, is the creation of complementary strategic effect across all domains towards a shared political objective. Achieving a degree of physical or psychological control over an adversary creates strategic effect and requires an appreciation for the unique specializations and inherent difficulties of each domain-focused force. This appreciation acknowledges that institutional professionalism is hardly omnicompetent or

transitory between varied forms of military power.[ii]

Categorization of Joint Action

In *Military Strategy*, J.C. Wylie[iii] postulated that the "common factor" to all power struggles "is the concept of control, some form or degree or extent of control exercised by one social entity over another."[iv] Wylie's work offers a novel lens for viewing fighting, the solitary means of war.[v] This combat-centric view turns our attention to questioning the best strategy for combat operations.

Often, the territorial imperative quickly comes to the forefront. If land matters most, as some have correctly suggested,[vi] then our discussion of the best strategy comes to an abrupt conclusion if we assume that land is all that matters. If only land matters, then achieving the desired effect via the continental theory of war promulgated by some strategists answers our question. As Corbett suggested:

> *Since men live upon the land and not upon the sea, great issues between nations at war have always been decided—except in the rarest cases—either by what your army can do against your enemy's territory and national life, or else by the fear of what the fleet makes it possible for your army to do.*[vii]

Is this settled theory or should we concern ourselves with the nagging implications of Corbett's fear of the possible? How should we properly understand the latter part of Corbett's statement regarding the former's pious and possibly sole finality? Wylie offers us insight when he suggests, "there are actually two very different categories of strategies that may be used in war."[viii] He categorized these strategies as sequential and cumulative:

> *Normally we consider a war as a series of discrete steps or action, with each one of this series of actions growing naturally out of, and dependent on, the one that preceded it. The total pattern of all the discrete or separate actions makes up, serially, the entire sequence of the war. If at any stage of the war one of these actions had happened differently, then the remainder of the sequence would have had a different pattern. The sequence would have been*

> *interrupted and altered. But there is another way to prosecute a war…. The other is cumulative, the less perceptible minute accumulation of little items piling on top of the other until at some unknown point the mass of accumulated actions may be large enough to be critical. They are not incompatible strategies, they are not mutually exclusive. Quite the opposite. In practice they are usually interdependent in their strategic result.*[ix]

"[A] sequential strategy would utilize the ability of force to take and protect," Lukas Milevski suggests, "whereas a cumulative strategy would utilize the innate capacity of force to inflict damage."[x] Sequential strategies strive for finality in achieving strategic effect, while cumulative strategies effectively deny such finality.

Both strategies are best understood as complementary sides of the same coin, rather than inherently hierarchical or opposing inferior viewpoints. Sequential strategy promotes inherently offensive assertions of control, while cumulative strategy is an inherently defensive aspect of control that saps the strength of an adversary's assertions for control.[xi] These categorizations are not exhaustive, but they are useful in explaining how merging sequential and cumulative strategies jointly enhance strategic effect.

So, what aspects of joint action are typical of sequential and cumulative strategies? Conventional land power is a sequential strategy because of its unique ability to control political territory. Only conventional land power can assert control by seizing political territory, and only conventional land power can achieve control by protecting that valued territory. Alternatively, forms of power promoting cumulative strategies are sea power, air power, space power, and cyber power. Guerrilla warfare is also a cumulative strategy. All cumulative strategies, however, lack direct control upon the territorial imperative.[xii]

Explanation of Joint Action via Sequential and Cumulative Strategies

It would seem inherent in Wylie's suggestion that the "ultimate determinant" of control "in war is the man on the scene with a gun."[xiii] However valid this

point might be, as suggested above with the coin analogy, it illuminates only one part of the whole. War is a "duel on a larger scale" between opponents with varied capabilities and strategies at their disposal. There is room on both sides for misconceptions about the nature of the aforementioned coin.

Zealots will always promise "decisive" war termination via either type of strategy, omitting the obligatory importance of jointness. Slogans such as "Victory through air power,"[xiv] and "[land power] when specific outcomes matter,"[xv] illustrate two such examples. Sometimes these are suggested as result of unwitting reductionism, but can also be the polemic tools of ideology or cynical competition for resources. The greatest barrier to joint action is parochial thinking that does not fully appreciate other strategic viewpoints, more precisely, a blend of sequential and cumulative strategies.

Relationship of Jointness to the Interaction of Sequential and Cumulative Strategies

While finality is possible with sequential strategies, hostility is always at play. War rarely allows for a single decisive blow, nor is the ultimate outcome of a war usually to be regarded as final. Additionally, lest we commit ourselves wholly to the lure of "decisive" strategies, one can never overlook the political constraints dictated by context in asserting control.[xvi] Clearly, there is more to consider than a simplified perspective of "decisiveness."

Milevski illuminates the interplay between cumulative and sequential strategies further:

Cumulative strategy is underappreciated, in part because it cannot be 'of itself reliably decisive'…. Its effect is limited and only works over time, anathema to those strategists whose aim is short, decisive wars. Cumulative strategy can on its own only achieve a denial of control the result of which is to obscure the choices that really are available and the consequences they may have…. Bereft of the ability to take, it cannot force a conclusion upon [an adversary] unwilling to accept it, as may be ultimately possible with sequential strategy…. To those not trained to think in terms of control, denial of control as an operational method seems

inexplicable as it does not fall into more popular categories of operations such as direct and indirect or attritional or maneuver. Bereft of an intellectual framework, however implicit, practitioners facing a cumulative strategy have no way of understanding the character of the threat they face. This lack of comprehension affects not only the strategy chosen to counter it, but also practitioners' grasp of who is more strongly affecting whom.[xvii]

The interaction of cumulative and sequential strategies is complex. As a result, it is useful to consider this interaction during the ongoing debate over war termination, counterinsurgency operations, and even resourcing of our future military capabilities. In each of these areas, success will be secured by balanced use of cumulative and sequential strategies in a joint and thoughtful manner.

Anticipation within a Positive View of Joint Action

Wylie's theory of control viewed through the dichotomy of sequential and cumulative strategies is not meant to be prescriptive nor mathematical. After all, the interplay between friendly and adversarial combinations must be tested in real war.[xviii] Actual context requires the subjective blend of these strategies into unified action. By understanding the core of control as having two equally important strategies, sequential *and* cumulative, one grasps the fundamental basis of jointness as a principle in achieving a desired strategic effect.

"One can sense a very real possibility that this concept of sequential and cumulative strategies operating in coordination," Wylie suggests, "may help us form more valid judgments of the interrelationship between ground and air, ground and sea, and sea and air forces." Since he wrote these words, technology has irrevocably changed the modes of warfare making this interrelationship more complicated. Nevertheless, Wylie grasped the most important element of the debate when he suggested that control was best achieved via an interoperable application of both cumulative and sequential strategies.[xix] It is for this reason that strategists should willfully acknowledge and be driven by a holistic understanding of the necessity for jointness,

rather than by force of law. My personal theory suggests that this approach to joint action will increase success in translating tactical action into strategic effects that promote our national interests.

Major Richard (Rich) Ganske is an Air Force officer, B-2 pilot, and weapons officer. He is currently assigned to the Army's Command and General Staff Officers Course at Fort Leavenworth. All views are his own. Follow him on Twitter: [@richganske](https://twitter.com/richganske)
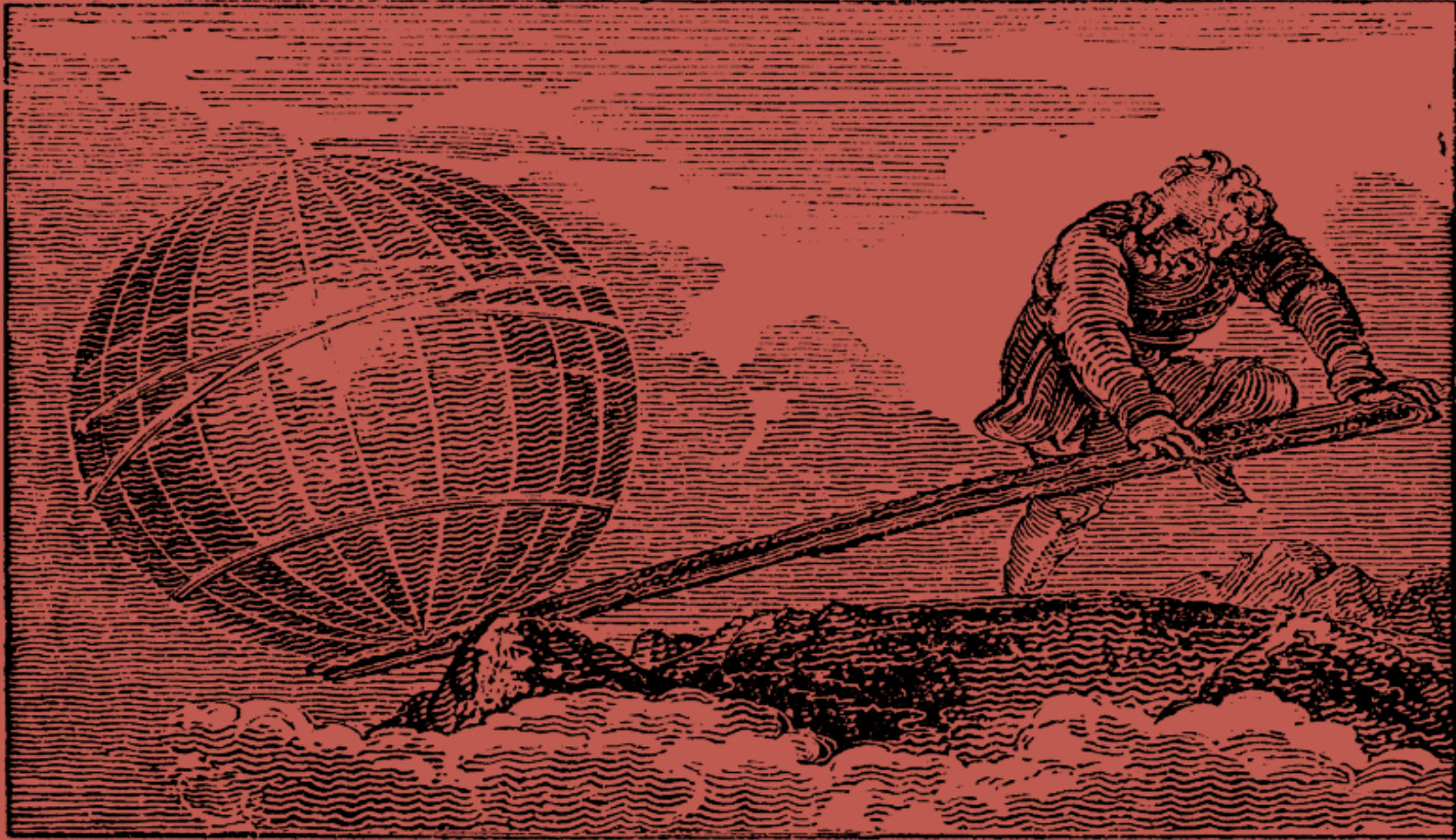
Cyber Power

Opportunity, Leverage, and Yet...Just Power

Billy Pope

Cyberspace is enabling new forms of communication, influence, awareness, and power for people around the world. Families use cyberspace to communicate face-to-face over great distances. Financial institutions execute global business and commodity trades at the speed of light through the cyberspace domain. The world's citizens are granted unprecedented access to information, facilitating more awareness and understanding than at any time in history. Yet the same cooperative domain that fosters so much good for mankind also offers a tremendous source of power. The antithesis of the mutually beneficial electronic environment is a cyberspace where competition and fear overshadow collaboration. This conundrum, however, is not new. Hobbes, in his fundamental law of nature, warns, "That every man, ought to endeavour Peace, as farre as he has hope of obtaining it; and when he cannot obtain it, that he may seek, and use, all helps and advantages of Warre."[i] Cyberspace will continue to

civilize. As the domain matures, however, so too will the forces that aim to use the cyberspace domain to project power.

Before diving into the concept of cyber power, one must first frame the term *power* itself. Power, in its most basic form equates to might: the ability to compel a person or group to acquiesce through force. Thucydides captured this concept in his artful depiction of the Melian Dialog, penning the famous phrase, "the strong do what they can and the weak suffer what they must."[ii] Hobbes, too, warned that power possessed is power to be used, suggesting every man lives in a state of constant competition with every other man.[iii] In this way, power is the ultimate arbiter, framing both what a man can do and what he should do in the same breath.

The close cousin to might is coercion. Thomas Schelling suggests "Coercion requires finding a bargain, arranging for him to be better off doing what

we want—worse off not doing what we want—when he takes the threatened penalty into account."[iv] Unlike a strategy centered on might, coercion requires insight. Military strategists and theorists who emerged from the Cold War coalesced around a single basic tenet of coercion: one must attempt to thoroughly understand an adversary before coercion can succeed.[v] Hearkening Sun Tzu's notion that one must "know the enemy," this community of great minds suggests in-depth analysis helps determine the bargaining chips in the coercion chess match.[vi]

Coercion is not limited to massive Cold War-styled conflicts. Non-state actors and other asymmetric threats may also be influenced through coercive strategies. Emile Simpson, in his book *War From the Ground Up*, infuses current counterinsurgency strategies with Aristotle's concepts of logos, ethos, and pathos to distill the concepts of modern coercion.[vii] Simpson argues the vital importance of information as a source of power. He suggests the very definition of success in asymmetric conflicts is framed by one's ability to compel an adversary to accept an imposed strategic narrative. Simpson writes, "In this sense, success or failure in war are perceived states in the minds of one's intended audience."[viii] In wars where annihilation cannot even be considered as a feasible strategy, one must win with ideas. Coercion offers a framework of thought that centers on this very approach.

Why focus so much of an essay on cyber power theory to a lengthy discussion on traditional forms of power? Quite simply, cyber power is still just power at its core. Cyber power will not change the nature of war. Cyber power, at least in the foreseeable future, will not reorganize the international consortium of states, leaving the Westphalian system to flounder in a new electronic world order. Cyber power offers tremendous opportunities to enhance how people interact, cooperate, and even fight. It does not, however, make traditional forms of power obsolete.

Overzealous futurists exuberantly claim that cyber power is a game changer, saying things like, "Cyber war is real; it happens at the speed of light; it is global; it skips the battlefield; and, it has already begun."[ix] The attuned strategist will peer through the chafe, realizing that cyber power offers new,

innovative methods by which to project power. The same savvy practitioner will also appreciate that power and conflict are grounded in basic human requirements, psychology, and relationships. Neither Thucydides' realist notions of fear, honor, and interests, nor Keohane's collaborative concepts of cooperation and interconnectedness were developed with cyberspace in mind.[x] Cyberspace, and in turn any notion of cyber power, however, contains these concepts in troves.

What, then, is cyber power specifically? This author argues it takes two forms. First, cyber power extends and accentuates existing forms of military power. It helps shape the battlefield through intelligence collection and information operations. In some cases it facilitates military effects that were previously only achievable through kinetic means. Second, cyber power is a unique political instrument. Most military professionals are all too familiar with the elements of national power marched out during professional education courses: diplomatic, informational, military, and economic. Cyber power connects to each of these components but also offers new options. Stronger than diplomacy and sanctions, yet not to the level of Clausewitzean war, cyber power expands the spectrum of power projection available to policy-makers.

In its militaristic form, cyber power has proven its worth as an accoutrement to traditional military engagements. Two historical examples of air power employment serve as cases in point. When the United States repelled Iraq's invasion of Kuwait in 1991, the American Air Force disabled Iraq's integrated air defense system by permanently destroying radar sites, anti-aircraft systems, and electrical switching stations.[xi] In 2007, the Israeli Air Force penetrated Syrian airspace en route to an alleged nuclear reactor at Dier-ez-Zor. Israeli pilots simply flew past Syria's air defense systems undetected. While Israeli officials have never confirmed the details of this operation, it is widely accepted that a cyber attack blinded the air defense systems, achieving the desired effect, while preserving the systems and their associated personnel from physical destruction.[xii] By producing military effects, cyber power enhances more traditionally understood forms of power in terms of might and projection.

The second framework of cyber power, however, places more emphasis on the combination of interdependence and leverage than military might. In this way, the concept of coercion again takes center stage. The United States serves as an appropriate case study. America is the most technologically advanced nation on Earth. The U.S., after all, invented the Internet and gave rise to the framework for cyberspace. Until very recently, the United States maintained control over the mechanisms that form the central nervous system of the Internet and its interdependent connections.[xiii] This outright advantage, however, also translates into a serious vulnerability. The U.S. and other similarly connected nations are more dependent on cyberspace for normal societal functions like banking, municipal utilities, and interstate commerce.

Prominent powers are incentivized to exercise cyber power to achieve political effects while attempting to limit vulnerabilities to the same types of actions. Largely non-lethal and quite influential against nations that find themselves dependent upon the domain, cyber power offers attractive options. Some states will attempt more cooperative approaches to limit vulnerability, as Keohane's post-hegemonic theoretical approach would suggest. At a minimum, capable entities will communicate their abilities to exert influence in the cyber domain to influence the strategic narrative Emile Simpson so aptly describes. The ability to project power in the cyber domain becomes an important source of influence alongside economic, military, informational, and diplomatic leverage. It is in this grand-strategic purview that cyber power holds the most potential.

The difference between these two aspects of cyber power is both strategic and philosophical. In the militaristic sense, cyber *might* conjures a Clausewitzean approach where engagements form the foundation of strategy and digital blood is the price of victory.[xiv] A strategy centered on coercion, leverage, and dependence, however, falls into the realm of Sun Tzu and Liddell Hart where perfect strategies involve very little actual confrontation on the way to achieving political objectives.[xv] Familiar in concept yet quite novel in execution, these two methods produce power where none previously existed. Both approaches, however, must be considered as parts of a greater whole that includes the full spectrum of power and political will. Cyber power is poignant and increasingly relevant, but it is not sufficient in and of itself.

While some soothsayers predict cyberspace will reshape the global landscape and the power structures that govern it, this author suggests otherwise. So long as people depend on the physical domains of air, land, and sea for basic survival needs, the physical powers used to protect these domains will remain relevant. That is not to say, however, that cyber power is flaccid. Nations that depend on cyberspace can be held at risk through the exploitation of cyber power for political effects. Whether through direct engagement or a more indirect approach, cyber power is capable of swaying political decisions in the same way others sources of power influence policy. Cyber power is a force to consider as military leaders and statesmen alike contemplate all dimensions of national power.

Major Billy E. Pope is a career Cyberspace Operations Officer in the Air Force and is currently pursuing a PhD of Military Strategy through the Air University. All views are his own. Follow him on Twitter: @BillyPope23

Social Choice
Preferences, Choices, and Strategy

Adam Elkus

There are many sources of power, but this essay focuses on choice-theoretic research and social choice in particular. *Social choice* concerns the process by which individual preferences are aggregated into collective choices through group decision processes such as voting.

I hope to convince the reader that strategists ought to be thinking about social choice and its implications for the complexity of attaining stable agreement. It is by pondering the nature of social choice that we truly understand why the strategist is a "hero."

Choose Wisely

Many strategic discussions default to simplistic explanations for why groups cannot achieve desired outcomes. It is easy to blame bureaucratic rivals, declare that salvation can be found in better strategy itself, make accusations of bad faith, or declare that America's strategic culture in some way guarantees

inconsistency and short-term thinking. However, there is a better, less value-laden approach to contemplating why strategy can sometimes seem like an illusion.

Colin Gray argues that his strategy bridge is a process of "dialogue and negotiation." Carl von Clausewitz also famously noted that war is "politics by other means." These formulations imply that both politics and strategy are products of group decision-making processes. This can be viewed on several levels—the group in the war room or the National Security Council, the "group" that routinely elects a President every four years, and everything in between.

I argue that one powerful method for analyzing the nature of group decision is the choice-theoretic perspective—and social choice in particular.

The choice-theoretic perspective models how decisions *individuals* make aggregate to group

outcomes. While there are many different methods of analyzing choice, I talk about one in particular: social choice theory. Social choice concerns the problem of agreement by analyzing how individual preferences create collective decisions. Social choice is often used to analyze elections—or any other situation in which individuals rank the desirability of alternatives and must find some way to fashion a group preference out of individual choices.

From Condorcet to Arrow, social choice's chief dilemma lies in the following problem:

> *Condorcet's second insight, often called* Condorcet's paradox*, is the observation that majority preferences can be 'irrational' (specifically, intransitive) even when individual preferences are 'rational' (specifically, transitive). Suppose, for example, that one third of a group prefers alternative x to y to z, a second third prefers y to z to x, and a final third prefers z to x to y. Then there are majorities (of two thirds) for x against y, for y against z, and for z against x: a 'cycle', which violates transitivity. Furthermore, no alternative is a Condorcet winner, an alternative that beats, or at least ties with, every other alternative in pairwise majority contests. Condorcet anticipated a key theme of modern social choice theory: majority rule is at once a plausible method of collective decision making and yet subject to some surprising problems.*

How can social choice help us think about strategy? Consider the simplistic explanations previously mentioned. Rather than pine after the unicorn of an ideal strategy (usually the strategy the analyst is biased towards) or assume that collectively bad outcomes occur due to malicious or incompetent decisions, we could take a step back and make a humbler assessment.

Public policy problems are complex and there are multiple valid points of view about how to decide between alternative choices. Unfortunately, these points of view do not always aggregate into stable and sustained group agreement. Some problems of strategic formulation and execution boil down to the fact that even small groups of people tend to produce inconsistent group judgments out of even very well-specified *individual* preferences.

This is not to argue that there is necessarily a well-defined mapping between majority-rule assumptions to strategy formulation and execution. However, I invite the reader to ponder it as an intellectual exercise—for reasons I will make absolutely clear at the end.

Social Choice: Alcohol, Sports, and Politics

I draw the following example from Maki and Thompson's *Mathematical Modeling and Computer Simulation*.

Let's assume that each individual in a group has a preference ranking on a set of alternatives. Say, for example that you like wine better than beer and beer better than whiskey. Given a choice, you choose beer over whiskey. Second, if you prefer wine to beer, you also prefer wine to whiskey. These two assumptions—that you can make choices between alternatives and that your choices are also consistent—are very important, but the second assumption especially so.

Why is this latter assumption important? Consider the alcohol example again. There are 3! permutations of {wine, beer, whiskey}. Do you make consistent choices about alcohol preference, or do your preferences cycle (e.g. loop) due to an inconsistency in the ranking? If you prefer wine to beer to whiskey to wine, there's a problem. Given that 3! = 6 unique preference combinations, this is all rather important information for any drinking buddies to know!

From the set of all individual preference rankings, we aim to construct a *group preference schedule* that details how the *group* ranks alternatives. A group preference schedule, like an individual preference schedule, ought to rank alternatives and exhibit consistency. However, this is not always possible.

Suppose we have a group of three people, labeled Joe, Anna, and Frank, and the alternatives are baseball, basketball, and soccer. They are trying to decide which sports game to watch. Let's say that the rules of the vote are that we make pairwise comparisons and the most preferred alternative is the "winner." Each group member has a preference ranking of the form {Sport 1, Sport 2, Sport 3} where 1 = highest preference and 3 = lowest preference.

Let Joe = A, Anna = B, and Frank = C . Let baseball = X, basketball = Y, and soccer = Z. **A** prefers X to Y to Z. **B** prefers Y to Z to X. **C** prefers Z to X to Y. Doing pairwise comparisons, we see that A and C both prefer X to Y. Additionally, A and B both prefer Y to Z. So, by majority vote, we get a preference schedule of {X, Y, Z}.

Problem solved? Not so fast. Both B and C prefer Z to X. Hence what we really have gotten is {X, Y, Z, X}. A majority vote system thus contains an inconsistency—the group prefers X to Y to Z but also simultaneously prefers Z to X. Unfortunately, as the number of individuals and possible alternatives for them to choose increases, the problem only gets worse.

To illustrate that social choice covers more than just cases of alcohol and ESPN remote control allocation, I relate something more relevant: elections. Kenneth Arrow famously developed a theorem that has some troubling implications for many systems of preferential voting. I relate a much more informal version of the theorem's formal statement below.

Let us assume that the voting method is a function that enables voters to rank each candidate by order of preference, and the election re-sorts the candidate list in order of voter preference. Let us also assume, however, some following conditions:

No Dictators (ND): *the outcome should not always be identical to the ranking of one particular person.*

Pareto Efficiency (PE): *if every voter prefers candidate A to candidate B, then the outcome should rank candidate A above candidate B.*

Independence of Irrelevant Alternatives (IIA): *the outcome's relative ranking of candidates A and B should not change if voters change the ranking of other candidates but do not change their relative rankings of A and B.*

Unfortunately, when we have three or more alternatives to choose from (see this page for a nice graphical visualization), the ability to produce non-cyclic group preference schedules given ND, PE, and IIA breaks down. Not all voting systems are described by Arrow's theorem, the assumptions about the

particular form that voter preferences take, and other factors are all controversial. Yet his theorem explains enough voting systems to make it one of the fundamental achievements of economics—and social science as a whole.

Conclusion: Social Choice and Strategy

I have only illustrated one small piece of a gigantic and complex literature. I ignore things like the median voter theorem, single-peaked preferences, mechanism design, stable matchings, and other desiderata. However, there was a reason why I chose social choice and the part of it that pertains to majority-vote elections.

Winston Churchill said that democracy is the worst form of government, except for all of the other forms of government tried. Like Churchill, it is the lot of the strategist to be unhappy with the nature of collective decisionmaking. Crossing the strategy bridge often entails bearing the burden of collective decisionmaking bodies and political entities that aggregate the desires of various stakeholders in a frustrating and sometimes counterproductive manner.

As I implied earlier, my simplified formulation of Arrow and related problems is only the start of a vast literature. The problems analyzed above are not destiny. But they underscore a fundamental problem: collective decision requires some means of gaining and sustaining agreement. At the root of many political and organizational problems is the simple and frustrating problem of doing so in a way that satisfies both normative and practical/instrumental expectations we have about the way collective decision ought to work.

The strategist could respond by denying all of this, placing their hopes in some unicorn of a sound strategy to gallop in and save the day or damning the systems and/or individuals they believe stand in their way. The strategist truly becomes Gray's "hero" when they recognize that—for whatever reason— they likely must live with the imperfections of collective decision. The heroism of the strategist lies in his or her willingness to bear a heavy burden but nonetheless formulate and execute strategy in spite of it.

Perhaps one does not require social choice to come to this realization. But it definitely helps.

Adam Elkus is a PhD student in Computational Social Science at George Mason University. All views are his own. Follow him on Twitter: [@Aelkus](#)

Land Power

More than Simply the Element of Decision

Nathan Finney

Every war, and every belligerent in every war, manifests a distinctive pattern of strategic behaviour among an expanding list of geographical environments. It is true that modern strategy and war registers trends towards ever greater complexity, ever greater 'jointness' to offset and exploit that complexity, and in the maturing potency of new modes of combat…It is no less true, however, that land, even ground, warfare has yet to be demoted to an adjunct, auxiliary, or administrative, role vis-à-vis superficially more modern modes and foci of fighting.[i]

In a discussion over the modes of power that are employed to achieve political purpose, the above quote would likely halt all communication before it even started. Some would even immediately engage their cognitive biases and fill their slings with the tried-and-true military service-focused and parochial rhetorical ammunition. The current narratives from the various services can certainly be seen to support such an assertion.

However, while the above quote captures repeated insistence on the importance of land power, the author also indicates that while land power is vital, it is not sufficient, for "In practice, thus far, no single geographical domain suffices as provider of all strategic effect that belligerent states need."[ii]

So, when a political decision requires a definitive, more enduring answer, land power will likely be the main element of national power employed—there's a reason the key theorist of war and land power focused on destroying an adversary's armed forces, occupying his country, and breaking that nation's will as his three main objectives in war.[iii] Such use of large amounts of men and women in campaigns of physical control are not the only use for land power, however. While it is the only element of national power that can compel through physical dominance

(or as some have described in recent posts by quoting Wylie, through a sequential strategy),[iv] land power can also accomplish tasks through three other approaches to the use of force—assurance, deterrence and coercion—to create strategic effect.

Beyond Physical Control

To Gray, "strategic effect is the [cumulative and sequential] impact of strategic performance on the course of events."[v] It is the expression of how well a force translates tactical action into political gain; or said another way, how well the effects of military action maintain alliances and/or force an adversary (or adversaries) to change their behavior to match our desires. Given the fact that land power will likely be the element of national power least used to create strategic effect in today's environment given its high political cost at home and abroad, how does an Army, as the principle manifestation of land power, provide options to assure, deter, and coerce?[vi]

Deterrence and assurance require both credibility and capability. Credibility is created through the perception that force will be used to achieve stated interests. However, without an acknowledged force required to achieve said interests, i.e. the capability, then the threat of its use to deter undesired behavior or assure anxious allies is empty. In the end, an adversary cannot be deterred or an ally assured unless they believe the offending party can be compelled to appropriately change their behavior. While other elements of national power are important to either deterrence or assurance, both require credible and capable land power, the only element of national power that can compel behavior through physical control. The size, capability, proficiency, and posturing of land forces is what provides a credible deterrent and assures allies. As has been shown in recent events in Eastern Europe, the lack of a credible and capable force for deterrence can lead to political adventurism by adversarial entities and a failure to assure allies in a region.

Coercion is used to impel adversary behavior by shaping choices, either by punishment or denial; both utilize physical and psychological factors. Coercion by punishment is accomplished by damaging or destroying adversary capabilities required to achieve

their interests, such as destroying naval assets that are being used in a blockade. Coercion by denial is using force to prevent the adversary from accessing the resources or territory required to accomplish their goals. Land power largely utilizes coercion by denial, such as placing American troops in a threatened country to significantly raise the costs of any action by an adversary. This also provides a degree of assurance for that partner nation. A recent example is the deployment of U.S. troops to Poland, Lithuania, Latvia and Estonia.

The use of these three approaches to force—deterrence, assurance, and coercion—can be seen as largely an attempt to control the choices of an adversary through the threat of force or limited use of violence. In Wylie-speak, since he is in vogue throughout these blog posts, the threat of force or limited use of violence by land forces in this manner reduces the adversary's choices through a sequential strategy, ideally creating "implications of certainty of the end" through "its persistent exercise…typically steadily reduce the number of viable options open to the enemy."[vii]

Land Force Considerations Outside of Physical Control

Using land forces to deter, assure and coerce in today's strategic environment will require three core elements:

1) The use of smaller, tailorable elements of the Army to accomplish strategic objectives. From a Special Forces detachment supporting a partner nation through foreign internal defense to a battalion task force taking part in a multinational exercise to strengthen NATO, Army forces must be prepared to train, equip, deploy, employ and sustain smaller packages of forces around the world. However, these elements must also be able to tap into larger regionally-focused/based forces to provide flexible options and scale up to conduct operations that provide denial by punishment, or compellence when necessary. The ability to disaggregate for cumulative operations must be matched with the ability to re-aggregate into larger formations—up to Division- and Corps-level—to conduct the combined arms

operations required in ground combat across the range of military operations.[viii]

2) A better balance of combat and enabling capabilities. While the application of land power is largely seen through the action of combat elements, so called "tail" elements are as important, if not more so, to military forces. Even Clausewitz, who purposefully excluded logistics discussions in his *magnum opus* due to his focus on the fighting itself and its use as a political instrument, recognized that "The provisioning of troops, no matter how it is done…always presents such difficulty that it must have a decisive influence on the choice of operations."[ix] The U.S. Army post-WWII has largely diminished the importance of its enabling capabilities—everything from transportation to engineers to missile defense to logistics—in favor of the "tooth" resident in its combat formations, even to the point of contracting out significant portions of the enabling functions; this in spite of the frequent acknowledgement of the importance of logistics in war.[x] The Army must create a better balance between combat units to those that project, set, protect, and sustain a theater.

3) Assigning dedicated Army forces to geographic combatant commands and posturing those forces forward. Supporting the two elements above, land forces should be more permanently provided to those that use them in theatre. The value of Army forces is not that they can be made expeditionary, but that they can provide quick and enduring force when properly postured in theater. These elements can be used to conduct any and all of the three uses of force, in addition to being present when compellence, or a sequential strategy, is required.

Conclusion

In discussions of military power today there is much elaboration upon of the loss of "overmatch capability". This term is largely meant in terms of the decreasing technological gap between the U.S. and its likely adversaries, from non-state actors with anti-acess/area-denial capabilities to near-peer states with air and sea platforms that look suspiciously like our own technology still in production. Another aspect of overmatch is how presciently forces are

postured and organized to prevent conflict through the assurance of allies or the deterrence or coercion of adversaries—or to be used to compel an enemy, if necessary. A decrease in overmatch from this aspect creates risk that our military will not be able to achieve the missions the U.S. requires of it. While we must mitigate risk across all domains, risk to the land domain is the most strategically costly. For, "Military success in land warfare can have a decisiveness unmatchable by success in the other geographies. If a state loses on land, it loses the war."[xi]

Major Nathan K. Finney is an Army officer and strategist, the editor of The Bridge, and a member of the Editorial Advisory Board for the Infinity Journal. He holds an MPA from the Harvard Kennedy School. All views are his own. Follow him on Twitter: @bareftstratgist

Sea Power

Bringing Balance to the Force

BJ Armstrong

"*The Navy, within the Department of the Navy, shall be organized, trained, and equipped primarily for prompt and sustained combat incident to operations at sea.*"
— Title 32, Code of Federal Regulations

It shouldn't surprise any of us that combat at sea is the focus of the United States Navy. It seems perfectly rational. This focus, codified in law and embraced by recent tradition, results in a view of sea power that skews toward the wartime, both the operational and tactical. Over the past century this has resulted in a slow migration away from the true meaning of the word. "Sea power" has lost the broad political, diplomatic, and economic meaning and the importance that it once had, shifting away from its true and proper place in strategic affairs.

Inspiration and Foundation

Uniformed and civilian senior leaders are not solely responsible for this shift. Strategists, with a broad definition of the label, share a hand in the shift as well. The Clausewitzians and devotees of Sun Tzu have come to dominate the foundations of strategic thought in the 21st century. There is no doubt that the writings of these thinkers offer a great deal to inform military affairs today. There are, however, some issues with using the texts of the Prussian General and the Chinese courtier as baselines for modern views of strategy. In doing so, we take continentalist views of the relationships between states and military force and attempt to apply them to a globalized world.

The migration of sea power toward the operational and tactical, and the attempts to connect it to

continentalist strategic ideals, can be seen partially in the rise in popularity of Sir Julian Corbett's Some *Principles of Maritime Strategy*. As Alfred Thayer Mahan's influence has declined Corbett's has grown and is commonly cited as more "relevant" by naval officers today. Surely, part of this has to do with the simple fact that Corbett wrote more clearly than Mahan did. It also must be stated that one book is not illustrative of the entirety of the British lawyer and lecturer's thinking on sea power. However, the tendency within Corbett's book to focus toward operational issues, or the "grammar" of naval strategy, allows it to appeal to a more practically minded, combat centric officer corps.

Sea power, however, is much more than operational design or combat planning for forces at sea. It has to do with international relationships, economic power, commercial interests, diplomacy and statecraft. Its results are not seen solely at the business end of a Tomahawk missile or in ballistic missile submarine patrols, but also on the stock of shelves at Walmart and the price of gas at the pump. This confusion, between the battle fleet and the navy, between combat incident to operations at sea and the global power and influence of maritime forces, results from the view which labels sea power as a domain centered ideal, as another name for combat operations at sea, rather than a broader field with wider relevance to the world affairs.

Looking Outward

The concepts surrounding the importance of naval forces, and the role which maritime issues play in global affairs, go back centuries. From Thucydides to Sir Walter Raleigh the importance of power at sea had been recognized and written about long before Mahan began reading Gibbon at the English Club while on liberty ashore in Lima. Despite our modern focus toward it, combat between fleets was never the exclusive *raison d'etre* for maritime forces, or the only lever of power available to them. Raleigh illustrated this in the 17th century when he wrote, "whosoever commands the sea, commands the trade; whosoever commands the trade of the world commands the riches of the world, and consequently the world itself." In the United States this was echoed in 1787 by *Federalist Paper No. 11*, which advocated

for the founding of the United States Navy on diplomatic and economic/commercial grounds instead of the need for wartime combat at sea.

In *The Influence of Sea Power Upon History* Mahan lays out the six elements of what makes a nation a sea power, none of which explicitly involve combat. Instead they are the factors that lead a nation to become a sea power. His initial discussion is as much political is it is military. In later works he continued to develop his thoughts on the position of sea power in world affairs. We all know the Clausewitizan truism that war is politics by other means. However, Mahan took things a step further and stated that political/diplomatic, economic/commercial, and military/combat considerations were all one integrated problem and that sea power was part of the connective tissue between the three in a globalized world.

This view of sea power, as something more than simply the when and how battle fleets are put together for combat, may be part of the reason that some continental strategists tend to struggle with the concept. Sea power strays into the realm of statecraft, global rivalries, and grand strategy in a way that may be uncomfortable for strategists focused on borders, territorial occupation, and the "decisiveness" of boots on the ground forcing a population to relent. The very concept of grand strategy is anathema to some, and debated by others, who claim the strict constructionist view of Clausewitz's writing. These strategists tell us that the word "strategy" is reserved only for military combat. Today the concept of sea power is all too often viewed through this very limiting prism.

Bringing Balance to the Force

There are two dueling roles of navies that must be fulfilled to truly exercise sea power. One, as alluded to in the mission outlined by the Code of Federal Regulations, is to fight wars on and from the sea. This is critical. The ability to defeat adversaries lies at the foundation of the credibility needed to execute the rest of the sea power writ. But it is as much the beginning as it is the end of the sea power discussion.

The other mission of naval forces, which has been an important part of naval history for centuries, is to

preserve the peace and secure the global system. This dual responsibility, conducting deployments and operations in both wartime and peacetime, has been central to American naval history since the very founding of the Republic. It was illustrated by Professor Craig Symonds when, in his study of the political debates on naval affairs in the first decades of the nation, he wrote:

> All of President James Monroe's surviving papers on the navy or on naval policy reflect a concern that it efficiently perform two distinct services: first, that it be adequate to cope with the daily problems of a maritime nation—smuggling, piracy, and combating the slave trade; and, second, that it provide the United States with a comfortable degree of readiness in case war should be forced upon the nation.

Despite this centuries old tension between the exercise of sea power in war and in peace, since 1941 the United States Navy has maintained itself on a war footing. The Second World War led directly into the Cold War and when the Soviet Union fell decades later the Navy's institutional memory remembered nothing but a wartime posture. This mindset is not exclusive to the Navy. However, as a result the sea services have struggled with their vital role in the peace for more than two decades. Some have even resisted the discussion of their importance to the global system on a level above "combat incident to operations at sea."

As we approach the centenary of Mahan's death it is time to reexamine our modern conceptions of sea power. This will be a challenge. In recent decades naval officers have been taught strategy built on a land power framework and may have overlooked some of the fundamental differences between a continental view of national power and a global view international affairs. To uphold our responsibilities and American interests in the 21st century we must focus on a global view. It is time to expand the thinking, writing, and theory of sea power across the spectrum of its military, political, and economic implications. The broader obligations of a maritime state and a global power require it.

BJ Armstrong is a naval officer, helicopter pilot, PhD candidate with King's College, London, and a member of the Editorial Board of the U.S. Naval Institute. He is the editor of "21st Century Mahan: Sound Military Conclusions for the Modern Era." This is offered not as a personal dogma, or a theory of overall power, but instead as some general thoughts on a specific element of national power: sea power. All views are his own. Follow him on Twitter: @WWATMD

Amphibious Power

A Key Element in the Strategic Theory Canon

Brett Friedman

The two giants of sea power theory, Alfred Thayer Mahan and Sir Julian Corbett, both touched on amphibious operations but both are properly considered sea power theorists. Mahan disliked amphibious operations, declaring that they were "harder to sustain than to make." He judged them dangerous to those forces extended ashore and that this danger outweighed their potential benefit. In Mahan's cost-benefit analysis of amphibious operations, they were a waste of resources. Mahan viewed the sea power side of the equation as decisive.

Corbett, however, was more of a fan. Corbett thought that naval forces could rarely be decisive on their own and thus need the ability to project land forces ashore to achieve a decision. But, amphibious forces are dependent on naval forces for protection from enemy naval forces, supply and sustainment, and fire support. For Corbett, the land power side of the equation is decisive.

A little known theorist came down right in the middle. Lieutenant Colonel Earl "Pete" Ellis, USMC, wrote about naval and amphibious strategy in the early 20th Century, including the Marine Corps' contribution to War Plan Orange, *Advanced Base Operations in Micronesia*. Ellis viewed amphibious power as a symbiotic relationship between land and sea power. Expeditionary land forces are dependent on naval forces for the necessary sea control, transport, sustainment, and fire support. Naval forces are dependent on those land forces to secure key littoral terrain for protection and to secure forward

supply bases. In the course of this analysis, he identified the need for specialized, task-organized amphibious forces that could fill this niche, especially since amphibious assaults were becoming far more difficult in the face of modern artillery and machine guns. Since the focus of all of his writings was on those amphibious forces and their uses, he is perhaps the only amphibious power theorist in history. For Ellis, the mutually reinforcing symbiosis of land and sea power was decisive. He was proved correct during World War II: the US Navy could not strike at the heart of the Imperial Japan without seizing lodgments across the Pacific and Marine and Army forces could not seize those lodgments without Navy transportation, support, and sea control.

In Colin S. Gray's *Theory of War Taxonomy*, this theory of amphibious power falls into a category along with Mahan, Douhet, and Schelling. It is clearly not a general theory nor is it a general theory of a domain as it exists at the confluence of land, sea, and air. It does explain "how a particular kind or use of a military power strategically affects the course of conflict as a whole." A brief look at history illuminates this point.

The Influence of Amphibious Power on History

A few examples from history suffice to illustrate the timeless nature of amphibious power. The first occurred early in the Peloponnesian War. Sparta began the war dominant on land, while Athens was dominant at sea. While Spartan land power allowed her to ravage the fields before Athens herself, Athenian fleets plied the waters of the Mediterranean. In 425 BC, Thucydides landed a fleet at Pylos in Spartan-controlled territory. The fighting that occurred at Pylos and the offshore island of Sphacteria eventually led to the defeat and capture of about 300 Spartan hoplites by Athenian expeditionary forces. Land power and sea control did not lead directly to strategic effect, but the use of sea power to project land power to defeat and capture Spartan hoplites shocked the Greek world and led directly to the Peace of Nicias. The Athenians subsequently botched the peace and thus squandered the strategic effect garnered, but they would not have

had the opportunity at all if not for the use of amphibious power.

The second example occurred during the Second Punic War. The sea control of the Mediterranean gained by the Romans after the First Punic War had profound strategic effects: it force Hannibal into a difficult march through the Alps which depleted the combat power he was able to bring to Italy and prevented significant reinforcement once he had gained a lodgment in Italy. His eventual defeat there, however, failed to end the war with Carthage. It was not until Scipio used sea control to project Roman land power across the sea to Carthage itself that decisive effects occurred and Carthage surrendered.

During the American Civil War, Union forces secured sea control early on and held it throughout the war as part of the Anaconda Plan. While the Anaconda Plan certainly produced strategic effects that choked the Confederacy off from reliable and consistent sources of supply, it did not have decisive effects by itself. In this case, amphibious power would not have decisive effects but the tactical level is interesting. Union General Ambrose Burnside was an amphibious visionary. As a Brigadier General, he formed an expeditionary force and developed radically new ship-to-shore tactics which allowed him to seize virtually all of coastal North Carolina for the Union.

Another waypoint in the history of amphibious operations occurred in 1915. During the Gallipoli campaign, British forces attempted to seize control of the Dardanelles from the Turks, allied with Germany. While the attempt failed, it is easy to see what kind of strategic effects victory could have produced. If British and French forces seize the Dardanelles, control of Constantinople could have easily followed, knocking Turkey out of the war entirely. Additionally, control of the Dardanelles would have allowed supplies from the Western allies to flow to the Eastern front, shoring up their Russian allies. The British and French had the sea power and the land power, but using both as amphibious power had great potential, if unrealized.

Lastly, World War II proved to be a high water mark for amphibious operations. In the Western theater, the Allies also largely secured sea control while

Germany dominated the continent. That sea control granted the allies the ability to project power ashore in Africa, Italy, and eventually in France. In the Pacific Theater, the entire Allied strategy depended on amphibious power. A measure of sea control was gained by the U.S. after the battle of Midway, but amphibious power was necessary to secure lodgments to allow the U.S. to project force across the Pacific Ocean. That sea control had to be translated into force projection ashore at dozens of islands, producing a credible threat of an amphibious assault on Japan herself and the ability to use air power to strike Japanese soil.

Conclusions from Theory and Praxis

Sea power can enable land power, land power can enable sea power, and the projection of power ashore is now dependent on air power. The fusion of all of these capabilities is amphibious power.

Specialized troops are needed to wield credible and effective amphibious power. Burnside's pick-up team of amphibious soldiers ran into daunting tactical problems in North Carolina. While U.S. Army troops drew on Marine tactics in the European theater, hard lessons had to be learned in North Africa and at Anzio and Salerno.

Despite the need for specialized troops to effectively conduct amphibious operations, amphibious operations are never solely the interest of marines. Navy forces and air support are essential to success and must train to the unique problems associated with projecting land power ashore. Armies are also concerned with amphibious operations. In a large scale conflict, there will not be enough Marines to conduct every assault. While the U.S. Army famously conducted more amphibious operations than the U.S. Marine Corps during World War II, they did so using doctrine developed by the Marines and capabilities already resident in the Navy.

Strategic Effects

There are numerous tactical lessons that can be learned from history as well. James Wolfe's campaign in Quebec during the Seven Years War is illustrative as is MacArthur's master stroke at Inchon in 1950. Both battles achieved far reaching strategic effects.

Amphibious power provides options to the side that has it, and the mere threat of amphibious forces the opponent to expend resources to defend against it, constraining his options. During the Gulf War, U.S. Marine forces aboard ship in the Persian Gulf forced Iraqi forces to station seven infantry divisions along the Iraqi coast to prevent a landing, depleting their combat power in Kuwait. Amphibious power, in and of itself, will rarely be directly decisive at the strategic level. It does, however, indirectly contribute to strategic effects because of the options it grants to the joint force. It is usually necessary to establish beachheads through which ground forces can flow, it can extend the range and reach of air forces, and can control littoral chokepoints to ensure the safety of naval forces. Additionally, amphibious power forces the enemy to defend their shores everywhere an amphibious assault is possible, consuming their resources and tying down combat power. Shifting defenders from one shore to another simply opens up another opportunity for a successful assault. Thus, a theory of amphibious power explains how that particular capability can affect the course of conflicts.

Captain Brett A. Friedman is a field artillery officer in the Marine Corps and is pursuing an M.A. in National Security and Strategic Studies through the Naval War College. All views are his own. Follow him on Twitter: @brettfriedman

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RUSS SATELLITE CIRCLING EARTH

Space Power
The Buttress of the Modern Military

Michael Lapidus

The United States possesses the world's leading military. It has the most sophisticated air, land, sea, and, now, cyber forces and wields them in such a manner such that no single nation, barring the employment of total nuclear war, approaches its destructive capability.

America's military power in these realms is identifiable. Fighter jets, bombs, tanks, submarines, ships, and more—these are all synonymous with the Nation's warfighting portfolio. And in the modern world, even though we cannot see a cyber attack coming, we can certainly see its results—as with the alleged Stuxnet attack on Iranian nuclear facilities. To the public, these tools together are America's "stick" on the global stage, for whatever purpose its leaders deem necessary.

Space is different. There are no bombs raining from orbit, and no crack special forces deploying from orbital platforms. The tide of battle is never turned by the sudden appearance of a satellite overhead. In fact, no one in the history of war has ever been killed by a weapon from space. There are actually no weapons in space nor will there be any in the foreseeable future.

Yet, America is the world's space power. The Nation's strength in the modern military era is dependent on its space capabilities. Space is fundamentally different than air, sea, land, and cyber power, and at the same time inextricably tied to them. It buttresses, binds, and enhances all of those visible modes of power. America cannot conduct war without space.

Simply, space is inherently a medium, as with air, land, sea, and cyber, and space power is the ability to use or deny the use by others of that medium. The United States Air Force (USAF) defines military space power as a "capability" to utilize [space-based] assets towards fulfilling national security needs.[1] In this, space is similar to other forms of military projection.

But, its difference comes in how it is measured. When viewed in this context, space power is thus the aggregate of a nation's abilities to establish, access, and leverage its orbital assets to further all other forms of national power.

Big Brother is Watching

It is important to note that space power is inherently global, as dictated by orbital mechanics. It is essentially impossible to go to space without passing over another nation in some capacity. Thus, the concept of peaceful overflight was established with the launch of Sputnik 1 in 1957, when the United States did not protest the path of the satellite even as it passed over the Nation. This idea stands in contrast to traditional territorial rules in which it would be considered a violation of sovereignty to put a military craft on or above another nation without express permission.

This difference became especially obvious in 1960 when Francis Gary Powers was shot down in his U-2 spy aircraft above the Soviet Union. Prior to that, the U.S. recognized that its missions over Russia were certainly a provocation and against international norms, but felt that the U-2 aircraft were more than capable of evading Soviet ground-based interceptors. The imagery intelligence (IMINT), they thought, justified the risk.

The United States faces the greatest diversity of military threats in its history. At the same time, the military is undergoing a significant size reduction.

The downing and subsequent capture of Powers was a significant embarrassment for the United States, and President Eisenhower immediately halted this practice. From that point forward, it became clear that the only viable way for the U.S. to gather substantial IMINT against an opponent with sophisticated anti-air capabilities was via satellite.

The best quantification of space power in its early days came just a few months after the Powers incident. The CIA-run Corona program produced the first successful IMINT satellite in history. This satellite, code-named Discoverer 14, obtained more photographs of the Soviet Union in just 17 orbits over the course of a day than all 24 of the previous U-2 flights combined. Electronic intelligence (ELINT) satellites, such as the early generation GRAB program (which actually launched before *Corona*), helped map Soviet air defenses by detecting radar pulses, which enabled strategic planners to map bomber routes. Although air-and-sea-based reconnaissance craft had the capability to also detect radar pulses, they could only identify targets at a maximum of 200 miles within the Soviet Union, far less than was needed to plan a secure route to interior targets. Space became more than just a one-to-one replacement of existing tools; it offered significantly more access to foes.

Superiority then became three-pronged: who had the broadest capabilities, who had the best technology in each form of space-based intelligence gathering, and who had the best coverage? Said another way, how well could a nation monitor all spectra in detail at all times everywhere that matters?

Nearly a decade after *Corona* transformed space into a viable form of power, the U.S. leveraged its first reliable weather monitoring and communications relay satellites in the Vietnam War. This expanded the role of space to that of an active component on the battlefield, rather than just a pre-conflict source of intelligence— an enormously important growth.

More than that, it represented a substantial evolution of war as a whole. The sudden enhancement of meteorological data due to dedicated satellites gave field commanders far greater clarity than in previous conflicts as to when would be the ideal windows to mount a strike or a longer campaign. This was especially important in Vietnam, which was often overcast.

Satellite communications also made their wartime debut in Vietnam. This capability offered the first true live link between war planners and field commanders, for the conveyance of orders and the timely distribution of sensitive intelligence. Whereas intelligence satellites broadened the world by opening up vast new areas to prying eyes, communications satellites dramatically shrank it.

However, this new channel was offered only to the top commanders in any region, due to limitations in infrastructure. Soldiers in the field still used radios to communicate with base.

All these space capabilities continued their evolutionary growth for the next few decades. But, it was Operation Desert Storm in 1990 and 1991 that marked space power as a *revolutionary* change in the conduct of war. Called the "first space war" by some, this conflict was the first time that satellite communications and new position, navigation, and timing (PNT) systems were utilized in direct concert with military forces to monitor and direct an ongoing campaign at all levels. Space-based intelligence-gathering satellites mapped Iraqi strategic installations well ahead of the first shots and continued to track changes in enemy force distribution. Satellite communications systems enabled ground forces to transmit targeting data to en-route aircraft, substantially improving the accuracy of dropped munitions. In addition, while the constellation was not yet fully deployed, the Global Positioning System (GPS) conveyed Coalition forces an enormous strategic advantage, by enabling ground forces to travel through previously unmapped territory and circumvent the heavily defended road system into Iraq.

Today

The United States faces the greatest diversity of military threats in its history. At the same time, the military is undergoing a significant size reduction. Yet, more so now than ever, it possesses the ability to strike anywhere in the world at a moment's notice. It does not need to constantly maintain local forces when it has force projection. In the modern world, force projection would not exist without space power.

Special forces and drone operations have taken front stage in America's Global War on Terror. IMINT and SIGINT satellites provide important intelligence about targets far below. GPS satellites enable drones to fly to areas of interest and, if necessary, guide their munitions to their final destinations with minimal collateral damage. Drone operators are often far away from the craft they are piloting, many times

even in a different hemisphere. This capability is only possible by utilizing high throughput communications satellites. For special forces, GPS is used to get the teams quickly to their targets. Further, portable satellite communications units allow them to relay updates to their commanders and call in support if necessary.

These options are especially effective against non-space actors who do not have the capabilities to strike back. However, space is increasingly becoming "congested, contested, and competitive"—meaning a broader group of nations is doing more to leverage space for their own military power and deny others from doing the same. China stands out in this realm. While the nation (exclusive of nuclear weapons) stands no match against the United States in any conventional confrontation, it possesses counter-space technologies that would dramatically curtail America's force projection strengths. In such a situation, America's power abroad would decline dramatically, to such a point that along the Asian coasts, China may have local superiority.

As such, the definition of space power is expanding, to being the aggregate of a nation's abilities to establish, access, leverage, and sustain its orbital assets to further all other forms of national power. Earth-shaking rocket launches aside, space is the silent partner in nearly American military endeavor today. Operations Enduring Freedom and Iraqi Freedom and the subsequent counterinsurgency operations that followed demonstrated that clearly enough. Space guides soldiers, sailors, airmen, and bombs to their targets, gives the photographs and signal intercepts to understand what enemies are planning, and provides secure, global communication in an era of global need.

Michael Lapidus is a space policy professional with a background in the field's history. All views are his own. Follow him on Twitter: @mikelapidus

A Personal Theory of Strategy

Politics, Power, Control: Theorising Strategy in the Cognitive and Physical Spheres

Nicholas Prime

"The primary aim of the strategist in the conduct of war is some selected degree of control of the enemy for the strategist's own purpose; this is achieved by control of the patterns of war; and this control of the pattern of war is had by manipulation of the center of gravity of war to the advantage of the strategist and the disadvantage of the opponent."[i]

This theory of control, whereby the aim of war is some measure of control over the enemy, and the achievement of this degree of control is the purpose of strategy, was most cogently expressed by Admiral J.C. Wylie. Its origins however date back to the early 1950s. When Wylie, along with Admiral Henry Eccles and German-American historian Dr. Herbert Rosinski, developed a general theory of strategy around this central concept of 'control'. While each of the three men's conceptions of this theory reflected variances in nuance and expression, all three sought to understand the interplay between politics, power, and control. The focus herein will be on the value of this theory as a means to understand strategy as something which exists and is practiced both in the physical and cognitive domains.

Understanding the Terms

A half century ago Wylie remarked that the study of strategy lacked a clear and consistent vocabulary, a statement that is as true today as it was then.[ii] In addition to the many definitions of strategy itself, there are as yet no established definitions for the terms and concepts which serve as the foundational elements for our understanding of strategy. It is important then to provide, in brief, a working conception of these terms so that their interplay can be shown in each domain.

Perhaps the most simple and practical definition of politics is that provided by Harold Lasswell who defined it as "the way people decide who gets what,

when, where, how, and why".[iii] Here we see the first unstated but unmistakable emphasis on choice as critical to understanding the concept. Another unstated but clear emphasis is on the role of authority, a crucial element in the practice of politics. As Lawrence Freedman has noted there is a critical interplay between power and authority, with a great deal of debate being had as to whether the two concepts are exclusive or extensions of each other.[iv] Freedman's discussion of power in a strategic sense (what he dubs 'strategic power') also emphasizes a duality between physical and cognitive. Though he makes clear distinctions between the physical expression as force (or the capability to use force) and the cognitive expression, what he sees as its perception in the mind of the 'target' or 'beholder'. While his focus on strategic power is largely on 'coercive capacity' the important term there is capacity.

Wylie saw politics as "the allocation, use, transfer of power" a conception which echoes both the interplay between power and authority, while also reflecting an emphasis on capacity.[v] Power then could perhaps best be thought of as energy, capable of existing in various forms such as watts of electrical charge or calories of food. Politics then is the means by which the power of a group, institution, or nation state is marshalled, allotted, and/or directed. Strategy then should be viewed as the mechanism by which the capacity (power) created through politics, is applied towards the aim of a given policy. The assertion of authority or more appropriately, *control*. Herein lies the subtle but distinct difference between Freedman's conception of strategy and that of Wylie, Eccles and Rosinski. Freedman defines strategy as "the art of creating power to obtain maximum political objectives using available military means."

Rosinski, whose understanding of strategy resembles that previously quoted by Wylie, defined strategy as the comprehensive direction of (military) power, applied through tactics, for the purpose of control.[vi] The difference between Freedman's theory and the control theory is subtle but significant. By placing the emphasis on strategy's purpose as being (some measure of) control, they are focusing on the *application* of power, in contrast to Freedman's focus on the *creation* of power.

Control as Cognitive & Physical

In developing their theories of strategy both Wylie and Rosinski placed the bulk of their emphasis on control in the physical domain or 'field of action'. As the intention was to establish control as a general theory of strategy, it was critical that theory bear equal relevance to each of the commonly identified 'domains' of conflict (land, sea, and air). In each of the respective domains the relevance and contribution towards control was measured when contrasted against destruction. The importance of this distinction is simple but significant. Destruction serves strategy only insofar as it contributes towards the achievement of control.

Implied in this emphasis on control, as opposed to an emphasis on destruction, is the focus on economy of force. By limiting the destruction and focusing it towards asserting a 'selected degree' of control over 'key centers of gravity' and/or 'lines of communication', control seeks to solve the challenge posed by strategy in the most economical means possible.[vii] Many theories of strategy lack this critical balancing. Favouring an emphasis on destruction, which can and often does become counterproductive. Strategies premised first on destruction emphasize as the primary means the use of (or through coercion, the threat to use) force. These strategies fail to account for the myriad of other means through which some measure of control, or contributions toward it, can be achieved. Such as political or economic pressures which can contribute towards control, adding to coercion, while curbing destruction only to that which is necessary. As Lukas Milevski noted, "control and coercion run along a single set of tracks: only the living can be threatened and consequently controlled, but they can only be so if, due to the expected cost or due to fear, the choice of continuing is less palatable than that of accommodating."[viii]

Wylie and Eccles also provide valuable and insightful observations on the cognitive aspects of control. For Wylie, the manipulation of the physical centers of gravity would, through its effect on the "equilibrium" of the conflict, effect the "critical decisions" of the adversary.[ix] According to Rosinski, strategy became a means of control by taking "into account the

multitude of possible enemy counteractions."[x] Eccles, in expanding on the point made by Rosinski, stressed the importance of a clear understanding of both the strategist's own objectives and those of his adversary. He viewed this as crucial to the holistic formation of sound strategic action. Understanding that objectives (both the strategist's own, and those of his adversary) were a critical expression of both the actions and choices, which one had to control through strategy.[xi]
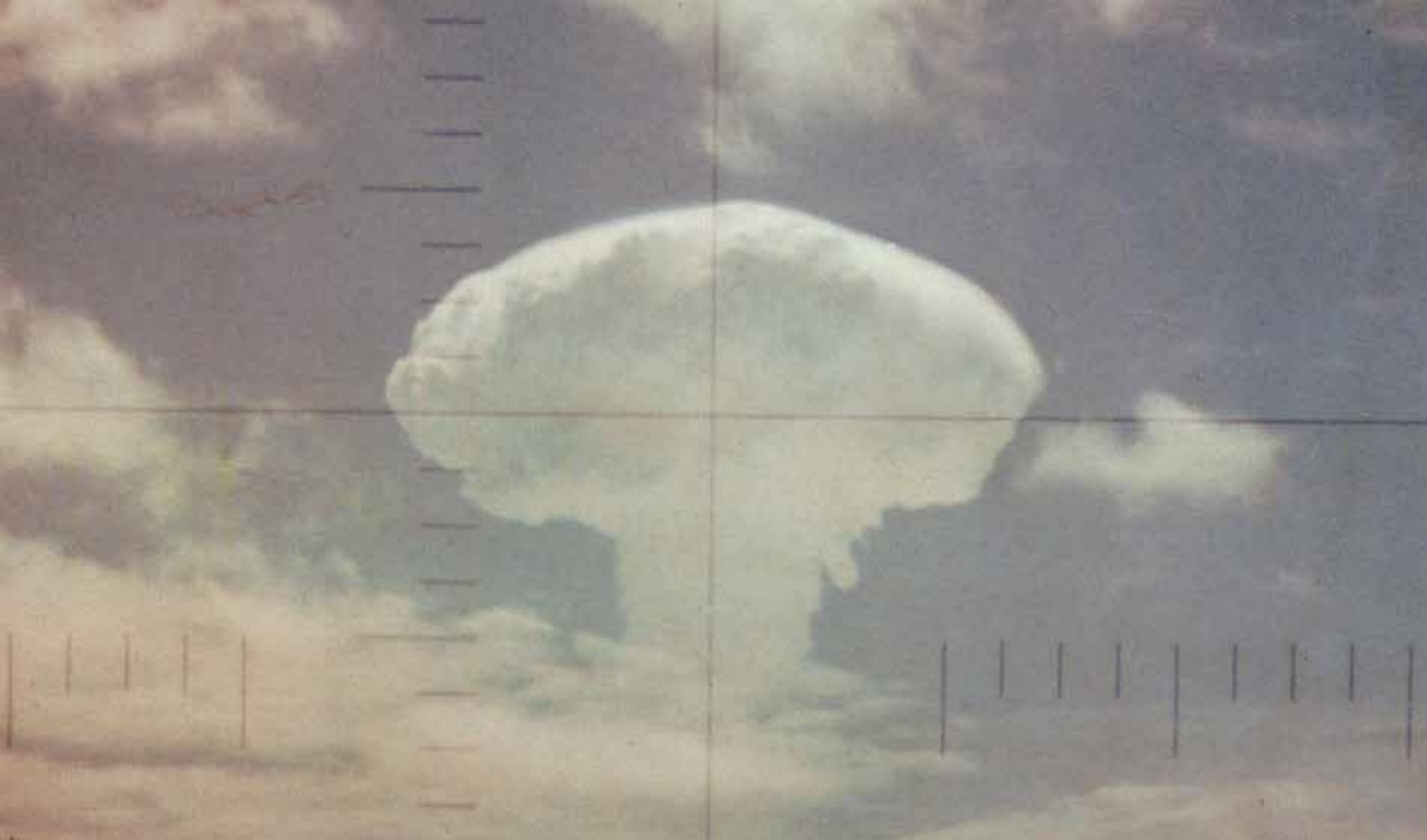
This emphasis on choice is critical, as Wylie noted, with respect to deterrence-based strategies predicated on the threat to use force. As the coercive effect of this threat to use force is itself a degree of control.[xii] The ability to control by dictating, limiting, or removing the choices of the opponent, is then implicit in the cognitive side of the control theory.

Why It Matters

There is a great deal of value to be derived from understanding this control theory of strategy. This understanding of the control theory allows the strategist to perceive, under the same conceptual framework. Both those physical strategies which utilize and rely on the direct application of force and destruction, to achieve the desired political ends. As well as those strategies of coercion and deterrence, reliant upon other measures to achieve that selected degree of control required for the desired ends of policy. Violence is inherent in the nature of war, but not in the nature of strategy (broadly defined), and certainly not in the nature of conflict.

The character of contemporary conflicts whether diplomatic or political, as illustrated by recent events in both the South China Sea and the Ukraine, has shown that power can be created and the aims of policy can be achieved through more than the simple application of force. In this regard a framework that applies the same understanding of strategy to achieve a policy through brinkmanship, economic coercion, or the use of military force, is of significant utility.

Nicholas Prime is an MPhil/PhD Candidate in the Department of War Studies, King's College London. His thesis research is focused on the evolution of American strategic thought in the first half of the Cold War. All views are his own. Follow him on Twitter: @NC_Prime

Nuclear Weapons

Thinking about Strategy and Nuclear Weapons

Matthew Hallex & Bruce Sugden

Harold Winton suggests "strategic theory has one foot in reality and another in concepts."[i] Strategic thinking about nuclear weapons, as practiced in the United States, certainly has one foot in concepts, but its grounding in reality is much shakier. Nuclear thinkers had no data-rich nuclear history to work from and so they built their theory upon deductive models. The result is a body of thought that reflects less an understanding of the worth of nuclear weapons for military practitioners than a collection of elegant models and American preferences that are confused with universal truths. In addressing the topic of nuclear weapons and strategy, we attempt to offer not a novel construct for thinking about nuclear weapons, but to highlight some of the shortcomings of the dominant approach to thinking about strategy and nuclear weapons and to suggest some guideposts to improve strategic thinking.

What's the use of strategic theory?

Strategic theory should assist the strategist in formulating an effective strategy and should shed light on the proper use of force.[ii] The primary take-away a strategic theory should offer the military practitioner is not a collection of lessons that will lead to victory, but, as Frans Osinga stated in his study of John Boyd's strategic thinking, an illumination of guideposts or "things that need thinking about. It must provide insight and questions, not answers."[iii] This echoes Clausewitz's observation that theory is a guide to self-education.[iv] It is about creating the proper cast of mind to think about the use of force in a particular strategic environment and to consider the relationships between ends, ways, and means within that context.

What is wrong with the dominant U.S. approach to thinking strategically about nuclear weapons?

Lawrence Freedman makes a useful distinction between strategists and the group of "nuclear specialists" who arose in the early days of the Cold War when the insights of classical strategy seemed inadequate to the challenge posed by nuclear weapons.[v] These specialists developed nuclear thought into a technical discipline that relied on deductions and models and grew insensitive to the operational and political challenges of nuclear use—the challenges that a strategic theory must address if it is to be useful for practitioners.

The escalation ladder is one example of the work of nuclear specialists. While the 44 rungs of Herman Kahn's ladder, covering all states of conflict from peace to Armageddon, has value as an analytical heuristic, its value for military practitioners is less clear. As Colin Gray points out "because one can conceive of thresholds for thought, it does not follow that those thresholds in fact exist. An escalation ladder, in the minds of a harassed policy maker, may offer an illusion of control…that is likely to be negated by the systemic nature of conflict. In the mind of the adversary, some of the rungs may be missing."[vi]

To wit, the ladder metaphor has never fit well with the Russians' view of escalation. While the American approach to escalation, which often times is incremental and gradual, was reflected in the linear concept of the escalation ladder, Russian strategic thought has seemed to have at its core the idea of "rapid, large-scale escalation." In the 1960s, Russian strategists expected intercontinental nuclear strikes between the United States and the Soviet Union to occur at the same time as, or *precede*, major combat in the theaters bordering the Soviet Union.[vii] Furthermore, as Stephen Meyer showed in his study of Soviet doctrinal writings, the "destruction of military-industrial targets in the strategic rear (i.e., in the US and Britain) would have taken place during the initial stages of the conflict."[viii] In the 1990s, former Soviet military officers and defense officials revealed to DOD contractors that in the 1970s the

Soviets did not think of "managing a nuclear war by climbing a ladder of escalation…"[ix]

Since 2000, in the wake of U.S.-NATO military operations against Serbia, Russian strategists have been speaking of "de-escalation of military operations" with an eye on deterring the intervention of the West into conflicts within Russia's "Near Abroad." In other words, they are thinking about employing nuclear weapons to compel a strong opponent to de-escalate and lower tensions on terms favorable to Russia.[x] Russian military exercises and simulations have included "limited" nuclear strikes against military targets in Europe, the Asia-Pacific region, and in the continental United States using long-range air-launched cruise missiles.[xi]

Contemporary American strategic dialogue has done little to address the inadequacies of "golden age" nuclear thinking. Rather, it has abandoned serious thinking about the role of nuclear weapons in strategy. A tremendous amount of ink is spilled discussing the characteristics and strategies of a conflict between China and the United States, for example, with almost no thinking about the role of nuclear weapons aside from a generalized desire to "control escalation" and remove the prospect of nuclear use from consideration in that envisioned great power war. The discussion of the role of nuclear weapons in the national security of the United States is reduced to determining the smallest number targets to be serviced rather than engaging with the strategies and doctrines embraced by our potential adversaries.[xii]

These decades-spanning problems with the U.S. approach to thinking strategically about nuclear weapons have a common problem: they confuse U.S. preferences and experiences with universal insights into the nature of nuclear weapons. For the early nuclear thinkers it was a product of lacking insight into what Russia and other nuclear states thought about nuclear weapons and how they developed their strategies and doctrines. In the face of incomplete information, the early thinkers extrapolated from U.S. nuclear thought. Contemporary U.S. thinkers, broadly speaking, have decided that nuclear use is impossible or at least serves no military ends, and therefore it is simply unnecessary to engage as seriously with

nuclear weapons as their Russian and Chinese counterparts continue to do.

How to improve strategic thought

How then should we think strategically about nuclear weapons? Strategic thinking needs to be liberated from dense prose and a fondness for systems analysis and game theory (as useful as they are in their own right) in looking at particular military problems and made accessible to practitioners. Nuclear thought that would be useful for military practitioners will have three features:

1. Placing nuclear weapons in the broader strategic context. "Nuclear strategy" is not a separate beast from "strategy." While the technical implications of nuclear weapons were significant they did not truly change the nature of war, nor did they change the ways by which we should think about it. Strategic designs and campaign plans ultimately act upon human minds to shape decision-making, but because we cannot know with certainty how adversary decision makers will develop their own strategies and react to our strategy and threats, even a strategy of deterrence has to have at its core war-making capabilities.[xiii] Plain and simple: a strategy designed to deter nuclear weapons use might fail, and so the United States might have to employ nuclear weapons to achieve its war aims. If nuclear strategy is to be useful it must be grounded in the broader strategic discussion focused on human psychology, decisions, and action. Thucydides and Clausewitz are no less useful in the nuclear age, and nuclear weapons and operations should be integrated into this deeper conversation about the ways U.S. means could be employed to achieve political ends.

2. Nuclear thought has national character. U.S. thinking about nuclear weapons must be responsive to foreign ideas about nuclear use if it is to be relevant to military practitioners. Furthermore, most bodies of military theory reflect the contributions of thinkers from different national and strategic contexts, addressing different geopolitical and military challenges and different technical environments. Mahan and Corbett offer different and often contradictory approaches to addressing seapower but make the discussion richer for it. In the contributions of the U.S. thinkers of the Cold War, we may have our nuclear Mahan. Now we need to be on the lookout for a nuclear Corbett among the thinkers of Russia, China, and other nuclear powers.

3. Thinking about nuclear weapons and strategy should be military minded. Nuclear weapons are not an abstraction; they are weapons. If strategy is to be serious it must grapple with this fact directly. Taking a lesson from Russian strategic thinking and nuclear war planning, we need to think about how countries might employ nuclear weapons in conjunction with other means to achieve their ends, and how the United States might have to threaten to use or actually employ nuclear weapons to achieve its war aims, especially if preferred conventional military means turn out to be inadequate to the military tasks at hand.[xiv] U.S. policies can change quickly in a crisis or a conflict when the president determines that vital U.S. interests are at stake, and U.S. military practitioners need to be ready to apply all the military tools at the disposal of the president.

Both Matthew Hallex and Bruce Sugden are defense analysts at Scitor Corporation in Northern Virginia. Their opinions are their own and do not represent those of their employer or clients. Follow them on Twitter: @mhallex and @sugdenbm, respectively.

Sea Power
The Power of Opportunity

Matthew Hipple

A ir and land power leave monuments to teach us of their authority: from the House of Commons' bomb-scorched archway to the nation-wide wreckage of the Syrian Civil War. Sea power's traces are washed away by its namesake— no rubble marking the battle of USS Monitor vs. CSS Virginia nor shattered remains of the convoys from the Battle of the Atlantic. The power with which the sea consumes is the same power with which sea power is imbued. Sea power's force, persistence, and fluidity –the vast opportunities afforded by the sea— create three properties: the gravitational, phantasmal, and kinetic manifestations of its power.

The Fundamental Nature of Sea Power

Sea power is the physical or influencing power projected by independent mobile platforms within a sea. Like the vast waters of the deep oceans, sea power does not "flow" from a source like air power would, nor does it need to "settle" as land power does. The sea is a large and open commons in which a platform can achieve mobile-and-independent semi-permanence. Being "mobile" gets to the core of sea power; it's an ability to maneuver a semi-permanent threat at sea or anywhere near or touching the sea. Sea power provides a unique mid-point between persistence and mobility.

Ordnance merely aimed or fired towards the sea is not sea power. Land-based aircraft dropping sea-mines is not sea power, just as naval gunnery on land targets is not land power, nor flying artillery shells air power. Land, sea, and air power can all be used to combat each other; their powers are not restricted to effects within or through their own medium. Our types of power are the spectrum of capability afforded by nature of one's presence within a medium.

Sea Power's Gravity: An Inescapable Weight

Adversarial resources are strongly drawn into **defense** against sea power's mobility and potency; in this manner, sea power's weight, or "gravity", holds down adversarial actions. Even a weak fleet huddled in port can generate sea power, forcing the enemy to pull resources away from more productive tasks to **hold** down an adversary's most mobile threat—it's **fleet.**

Take the Spanish-American War, for instance. The Americans had an abiding fear of the mere existence of Spanish sea power and the possibility that it would descend without notice on their coastline, shelling cities and port facilities. Though the Spanish fleet was ultimately wasted in a force-**on**-force fight, strategists have historically referred to a standing fleet whose purpose is to leverage mere threat as "fleet in being". Rather than winning through firepower, an in-port "fleet in being" has potent effect on even far-away nations by the potential of their sure potential.

Today it is easier to imagine a mobile "capability in being", rather than a stationary "fleet in being". This also leverages the advantages afforded by the sea. The might of this "capability in being" has been illustrated in the past by Allied sea power's forcing the Nazi's into building the failed "Atlantic Wall".

In WWII, sea power afforded the Allies significant advantage, while the Reich's land power was forced up against the coast to guard every inch of accessible shore of the Atlantic Wall. The Atlantic Wall stretched for hundreds of miles, covering every inch of Reich-held coastline. The scale of preparations and their drain on Nazi resources was enormous, but deemed necessary due to the threat of allied sea power's mobile capability to penetrate of the continent.

The gravity weighs not only on an adversary's defenses, but holds down an adversary's desire to project power. Contrast the case of Taiwan to that of the South China Sea. American sea power has been a guarantor of unimpeded passage in the Pacific since the end of WWII. Taiwan's existence reflects both the potential and the potency of American sea power, as was demonstrated in the 1996 crisis. However, China's growing sea power creates space for it to unilaterally declare control of new areas in the South

China Sea through 'salami-slicing', despite its neighbors' protests.

Ultimately, sea power is tangible. Its destructive capability is only matched by its potential influence. Sufficient sea power, even hundreds of miles away, has enough gravity to hold down or absorb the resources of the mightiest land or air power. While the adversary of sea power must guard every crack in his armor, a sea power is at liberty to bide time and seek an asymmetry.

The Phantom of Sea Power: Pervasive Uncertainty

Sea power's gravity is complemented by the obfuscation and fluidity allowed by the sea. Armies leave a trail—they transit urban areas, gather supplies from the land, and generally reside where we do. The sea is far more secretive about its residents. Like silent undercurrents, sea power can be hidden from observers, summoning fearful **phantoms.**

The best modern example of the sea power phantom is the submarine at the 1916 Battle of Jutland. The mightiest fleet on earth could not bring itself to destroy the German fleet for fear of lurking U-boats. This example of sea-denial highlights a greater return than the expenditure of any ordnance.

Today, submarines have become greater tools for generating uncertainty. The submarine's invisible presence places an adversary under threat of destruction by Tomahawk missile or direct action by inserted special operations forces. Further threat might be generated by the uncertainty of an un-located fleet or the aircraft that could come from anywhere deep enough for a carrier. Sea power has the unique ability to veil-**and**-move large amounts of force, leveraging fear of devastating capability hidden by the surface or the horizon.

Sea Power's Kinetics: When Opportunity Knocks

The gravity and phantom of Sea Power is summoned by a credible threat. History speaks for sea power: the British Empire, the Napoleonic Wars, the Russo-Japanese War, Pearl Harbor, German unrestricted

warfare, British logistics in WWII, island hopping, D-Day, and modern South China Sea bumper boats. In the interest of brevity, we will split sea power's kinetic abilities into two categories: logistics and violence.

Sea Power's logistical ability is often the forgotten part of sea power. A British WWI poster highlights this best. "Britain's Sea Power is Yours" consists not only of a fleet of warships, but an entire horizon of commercial and military supply vessels. The ability to execute and secure seaborne logistics and to use and defend access to the global commons is potent power indeed. The effects of sea power on Malta, from its seizure by Britain during the Napoleonic Wars to its stubborn survival against the mightiest air force in Europe during WWII, serves as a testament to the subtle potency of the physical and logistical components of sea power. This flexible logistics train can either build an offensive opportunity or sustain a force until such opportunity arises.

The purely destructive capacity of sea power has indirectly already been described. Gravity becomes matter, the Allied fleet putting the wedge's thin edge to the Atlantic Wall. The force feared by the Nazis came to fruition on D-Day. The phantom materializes, as experienced by Allied convoys facing wolf packs in WWII. It starts with the ability to find the point at which the thin end of the massive wedge can be applied; mobile forces deploying their feelers across the open commons. The American dance-and-smash across the Pacific is the best example, as Nimitz "island hopped" around Japanese defenses and two fleets fought for the first time without even seeing one another. Sea power allows forces a degree of sustainability of land forces to wait out an enemy while carrying along the independent payload with a degree of mobility of air power to respond in time to the development of that opportunity.

Sea Power: The Power of Opportunity

When we say "sea" we are using a placeholder for the large-and-open commons in which a platform can achieve mobile-and-independent semi-permanence. We discuss space power, but ships in space could eventually meld into a future sea power narrative. In WWI, one could argue that Zeppelins carrying

aircraft could have joined a sea power concept. Rather than limiting oneself to the conventional "sea", consider where humans have instinctively decided they can put "ships" from the type of freedom and opportunity the medium affords.

Sea power may have neither the total enduring strength of land power nor the mobility of air power—but it has a strategically potent degree of both. This affords it a unique gravity, an ability to generate fear, and a physical footprint unique from other powers. It finds, creates, and exploits opportunities better than any other type. It suppresses those of adversaries by virtue of its physical capability or its influence upon enemy action. Sea power is the power of opportunity.

Lieutenant Matthew R. Hipple, is a Surface Warfare Officer in the Navy, Director of Online Content at [CIMSEC](#), and host of the [Sea Control podcast](#). All views are his own. Follow him on Twitter: [@AmericaHipple](#)

Air Power
Annihilation, Attrition, and Temporal Paralysis

Richard Ganske

There is insight in exploring the unique advantages of each domain. And the speed, reach, height, ubiquity, agility, and concentration advantages of air power allow us to focus on how best it can be used.[i] This essay will contrast the usage of air warfare via annihilation and attrition to highlight a third way, paralysis. One of the principal advantages of air power is its ability to create the temporal effect of paralysis. While it is not wholly unique from other forms of power in this capacity, it is better at it than most due to the combination of its unique advantages. Admittedly, this is a narrow look at paralysis via air power, but one that demands a point of departure from previous conceptualizations of its factors and uses.

Defining Air Power

The definition of air power has eluded strategists since man first tasted flight. The most important aspect of defining is that we must avoid conflation with niche capabilities, missions, or even processes that are related to its practice. "To be adequate," as Colin Gray suggests, "a characterization or definition of air power must accommodate, end to end, the total process that produces a stream of combat and combat support aircraft."[ii] My definition of air power is the act of achieving strategic effect via the air.[iii] Air power contributes to compounded strategic effect via annihilation, attrition, and paralysis.

Categorization and Explanation

Hans Delbrück, in *History of the Art of War*, describes two Clausewitzian strategies of warfare. The first is focused upon the annihilation of one's adversary. The second, exhaustion, is more circumspect in its limited aims. Both are clearly subordinate to the idea that "war is nothing but the continuation of policy with other means."[iv] Delbrück extended these into *Niederwerfungsstrategie* (the strategy of annihilation)

and *Ermattungsstrategie* (the strategy of exhaustion, attrition). The former's sole aim is the decisive battle, where the latter is understood to have more than one concern, which is a spectrum between both battle and maneuver with the aim of exhausting the adversary. Delbrück's *History* suggests that neither annihilation nor exhaustion are inferior to one another, and that attrition is not the mere avoidance of battle. But he was emphatic that these strategies were subordinate and subject to the Clausewitzian general theory.[v]

While Clausewitz was, of course, focused on the land domain, air power has proven useful in both annihilation and attrition. The Desert Storm "Highways of Death" provides a useful example of the application of air power towards annihilation. And the best example of air power's application of attrition is one where it denied exhaustion: the Berlin airlift, with over 277,000 flights in a period of 15 months lifted 2.3 million total tons of supplies. In either case, was the application of air power uniquely responsible for strategic effect? No. In both cases— and in most every case—other forms of power aided the outcome via force, or the threat of force. But outside the Delbrückian dichotomy, there is a third way for to create strategic effect—paralysis.

The strength of air power in the combination of speed, reach, height, ubiquity, agility, and concentration also enables a fleeting form of influence in paralysis. This strategic categorization is analogous to the tactical categorization of firepower, maneuver, and shock. Where at the strategic level firepower is exhaustive and maneuver is destructive, shock seeks temporal paralysis. Paralysis is the aim to disrupt, disable, and degrade an adversary's physical, mental, and ultimately moral capacities. The aim of such a strategy is never an end in itself; it merely seeks to minimize destruction without precluding such action.[vi] Thus, the lasting effect of paralysis, like shock, is fleeting. A permanent state of paralysis is an unsustainable (and unacceptable) political objective, and its diminishing strategic effect is reinforced by empirical examination of history.

The ultimate consideration for deciding upon a strategy of paralysis via air power is whether or not it is prudently feasible for use. In at least two situations, it is not.

This straightforward admission occurs naturally because adversaries are not inanimate objects subject to one fell swoop, but adaptive duelists constantly seeking advantage against one another.[vii]

Whether air power is seeking to influence non-cooperative centers of gravity via an overwhelming tempo and variety of action,[viii] or complicate the adversary's "connectedness" by seeking a degree of isolation between its leadership, organic essentials, infrastructure, population, and fielded forces,[ix] paralysis has always lacked in attaining or achieving control.[x] However, this does not preclude strategies of temporal paralysis as essential precursor to, or pivot between, the strategies of annihilation or attrition where control can ultimately be achieved. In this manner, paralysis has shown some cumulative merit in exacerbating the cognitive problem posed to an adversary because it attacks their ability to understand the character of the threat they face.[xi]

Paralysis and the Laplacian Fallacy in Real War

Information and knowledge are imperfect and outcomes are not predictable. This thought contrasts Pierre Simon de Laplace, who by extension of Sir Isaac Newton's *Mathematical Principles of Natural Philosophy* suggested that the motion of heavenly bodies were mechanistic and determined completely by physical law. If you knew where one object was, you also knew where it was going in a predictable manner. Such Laplacian science cannot be effectively extended to war, as war cannot be mechanistically engineered.[xii] The Clausewitzian axiom of general friction, that which "makes the apparently easy so difficult," cannot be wished away by mechanistic approaches to war.[xiii]

The proper approach in seeking paralysis acknowledges the sub-optimal character of complexity, where simplicity is favored over ideals of greater effectiveness. Through this approach, one refuses the lure of the silver bullet or the bolt from the blue, but exchanges these for a more humble

magnification of the adversary's friction via mismatch, deception, disruption, and overload. The proper foundation of temporal paralysis is built upon the proposition that "actions taken to drive up the adversary's friction are as vital to success as those taken to minimize your own."[xiv]

The temporal advantage of paralysis is subjective to context and tied to chance, but not withstanding these practical limits, it is still extremely useful for transitioning to a complementary strategy of either annihilation or attrition, or both in parallel. This is why air forces have become accustomed to being the major—although not the sole—military force in garnering the strategic initiative in campaigns (or Phase II operations in doctrinal parlance of the American way of battle). Whether the outcome of that phasing construct is to compel de-escalation via the threat or use of additional joint force, or transition to the assertion of a degree of control via other forces as described above, it is still a priceless strategic advantage to have control of the air. Without a degree of control of the air, as a necessary but solely insufficient condition, escalation dominance is stunted and the final strategic outcome placed at risk.[xv]

Anticipation of Paralysis

The ultimate consideration for deciding upon a strategy of paralysis via air power is whether or not it is prudently feasible for use. In at least two situations, it is not. In those contexts where center of gravity analysis is counterproductive or made counterproductive and when your war aims are mismatched against an adversary seeking an unlimited aim.

The former becomes problematic when the concept of the center of gravity becomes as Antullio Echevarria suggests, "an article of faith." This is further exacerbated when disagreement occurs on the basis of epistemic rationality, which is logic founded on faith, typically from doctrinaire points of view. Finally, these problems are further compounded when a truly mechanistic approach is taken in center of gravity analysis that is tantamount to a "center of critical capability" analysis.[xvi]

The latter is problematic for paralysis on an empirical basis. Paralysis has typically performed poorly in protracted, internecine, and civil wars. One needs look no further than the recent counterinsurgencies to grip the truth of this. In these examples of war the "centers of conflict themselves tend to remain highly dispersed and deceptively diffused," according to Echevarria, where under "such conditions, time often benefits the less technologically sophisticated adversary."[xvii] As discussed above, such forms of war tend to obscure the true character of the threat sufficiently to mitigate the effectiveness of paralysis.[xviii]

Conclusion

While there are few truly unique aspects of domain-specific forms of power, each form has advantages that make it exceptional from others. For air power, that is speed, reach, height, ubiquity, agility, and concentration, which combine to provide it exceptional flexibility and versatility. While air power has demonstrably contributed to strategic effect via the strategies of annihilation and attrition, it has also done so via temporal paralysis. However, this transitory strategy is not conferred unlimited agency. Rather, temporal paralysis via air power is always subject to context and must never be applied mechanistically. It should be prudently avoided in cases where the adversary seeks unlimited aims. Finally, temporal paralysis is not inferior to its kindred strategies of war, annihilation and attrition.

Major Richard (Rich) Ganske is an Air Force officer, B-2 pilot, and weapons officer. He is currently assigned to the Army's Command and General Staff Officers Course at Fort Leavenworth. All views are his own. Follow him on Twitter: @richganske

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Defense Industrial Base

* *(From Figure 1) Reflects a manufacturing view of the defense industrial base. Information technology capabilities (i.e., data PED or cyber) have made industrial base capabilities more accessible to smaller countries with less national resources. How this impacts the curve or a nation's independence is worth further exploration.*

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Joint Action

[i] This essay is greatly indebted to the works of Clausewitz, Corbett, Colin Gray, Lukas Milevski, and especially J.C. Wylie as the means for developing a basis of joint action. The latter's work in *Military Strategy* is especially useful in parsing out how cumulative and sequential strategies drive how we think about war. Also, the author would like to thank Jeremy Renken, Scott Shipman, and Nick Prime for exchanges that further illuminated Wylie's theory of control to me.

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as a prerequisite for political advantage within a military context demands that he be held as a close second.

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Cyber Power

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[xiv] Carl Von Clausewitz, Michael Howard, and Peter Paret, *On War (*Princeton: Princeton University Press, 2011), 128,http://site.ebrary.com/id/10578581.

[xv] Basil Henry Liddell Hart, *Strategy*, 2nd rev. ed (New York, N.Y., U.S.A: Meridian, 1991), 324.

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[i] Colin S Gray, *Modern Strategy (*New York: Oxford University Press, 1999), 165.

[ii] Colin S Gray, *War, Peace, and International Relations (*London: Routledge, 2007), 316.

[iii] Carl von Clausewitz, ed. and trans. Michael Howard and Peter Paret,*On War (*New York: Alfrec A. Knopf, 1993), 102.

[iv] For example, see Rich Ganske's use of Wylie as quoted by Lukas Milevski: "[A] sequential strategy would utilize the ability of force to take and protect" found in Milevski, "Revisiting J.C. Wylie's Dichotomy of Strategy," 229.

[v] Gray, *Modern Strategy*, 19. The "cumulative and sequential" was added to the definition in Gray, *Strategy Bridge*, 18.

[vi] Elements of this strategic environment are not unique, of course, nor are its impact on the use of land power. For example, Clausewitz acknowledged the facts of limited war in his 10 July 1827 note and Corbett recognized land power was often ill-suited for limited warfare because of its inherent threat to the territorial imperative in his *Some Principles of Maritime Strategy.*

[vii] Lukas Milevski, "Revisiting J.C. Wylie's Dichotomy of Strategy: The Effects of Sequential and Cumulative Patterns of Operations," *Journal of Strategic Studies*, 35:2, 2012, 233.

[viii] David E. Johnson, *Hard Fighting*, RAND, 2011, 173,http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG1085.pdf, accessed 20 May 2014.

[ix] Carl von Clausewitz, ed. and trans. Hans W. Gatzke, *The Principles of War (*Mechanicsburg: Stackpole, 1942),http://www.clausewitz.com/readings/Principles/, accessed on 24 May 2014.

[x] For example, see Martin van Creveld's *Supplying War*, John Lynn's*Feeding Mars* and Benjamin Bacon's *Sinews of War.*

[xi] Gray, *War, Peace, and International Relations*, 313.

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[i] J.C. Wylie, *Military Strategy: A General Theory of Power Control* (Annapolis, 1989), 77-78.

[ii] Wylie, *Military Strategy,* 11.

[iii] H. Lasswell, *Politics: Who gets what, when and how? (*New York, 1958)

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[v] Wylie, *Military Strategy,* 90.

[vi] H. Rosinski, 'The Structures of Military Strategy' (1956), 18-19

[vii] Wylie, *Military Strategy,* 77-78; H. Rosinski, 'New Thoughts on Strategy' (1955), 2.

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[ii] Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd (*New York: Routledge, 2007), p. 11.

[iii] Ibid., p. 12.

[iv] Carl von Clausewitz, *On War*, Michael Howard and Peter Paret, ed. and trans. (Princeton: Princeton University Press, 1976), p. 141.

[v] Lawrence Freedman, *The Evolution of Nuclear Strategy (*New York: Palgrave Macmillan, 2003), p. 458-464.

[vi] Colin S. Gray, "What RAND Hath Wrought," *Foreign Policy*, No. 4 (Autumn 1971), p. 118.

[vii] Stephen M. Meyer, *Soviet Theatre Nuclear Forces, Part 1: Development of Doctrine and Objectives*, Adelphi Paper No. 187 (London: The International Institute for Strategic Studies, 1983/4), p. 18.

[viii] Ibid., p. 19.

[ix] John G. Hines, Ellis M. Mishulovich, and John F. Shull, *Soviet Intentions, 1965-1985*, Vol. 1, *An Analytical Comparison of U.S.-Soviet Assessment During the Cold War (*McLean, Va.: BDM Federal, September 22, 1995), p. 3.

[x] Mark Schneider, "The Nuclear Forces and Doctrine of the Russian Federation," *Comparative Strategy*, Is. 27 (2008), p. 411.

[xi] Nikolai N. Sokov, "Why Russia Calls a Limited Nuclear Strike 'De-escalation,'" *Bulletin of the Atomic Scientists*, March 13, 2014. For evidence that the concept of "escalate to de-escalate" has long existed in Russian nuclear strategy and operational planning, see Meyer, *Soviet Theatre Nuclear Forces, Part 1,* p. 30.

[xii] James Wood Forsyth Jr. , B. Chance Saltzman, and Gary Schaub Jr., "Minimum Deterrence and its Critics," *Strategic Studies Quarterly*, Vol. 4, no. 4 (Winter 2010).

[xiii] Colin S. Gray, "Deterrence Resurrected: Revisiting Some Fundamentals," *Parameters*, Vol. 40 (Winter 2010-11), pp. 99-106.

[xiv] For the seriousness in which Russian strategists approached thinking about fighting and winning wars, see Meyer, *Soviet Theatre Nuclear Forces, Part 1,* p. 32.

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[ii] Colin S. Gray, *Explorations in Strategy (*Westport, Conn.; London: Praeger, 1998), 63.

[iii] According to Colin Gray in *The Strategy Bridge*, "Strategic effect refers to the consequences of behavior upon an enemy. The effect can be material, psychological, or both."

[iv] Carl von Clausewitz, Michael Howard, and Peter Paret, *On War (*Princeton: Princeton University Press, 1989), 69.

[v] Gordon Alexander Craig, "Delbrück: The Military Historian," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton, N.J.: Princeton University Press, 1986), 341–342; Clausewitz, Howard, and Paret, *On War*, 87, 594, 607–608, 610.

[vi] David S. Fadok, "John Boyd and John Warden: Airpower's Quest for Strategic Paralysis," in *The Paths Of Heaven: The Evolution Of Airpower Theory*, ed. Phillip S. Meilinger (Maxwell AFB, AL: Air University Press, 1997), 359, accessed February 6, 2014.

[vii] Clausewitz, Howard, and Paret, *On War*, 75, 77, 79.

[viii] Fadok, "Airpower's Quest for Strategic Paralysis," 363–370; Frans PB Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd (*Routledge, 2006). Fadok, "Airpower's Quest for Strategic Paralysis," 363–370; Osinga, *Science, Strategy and War.*

[ix] Fadok, "Airpower's Quest for Strategic Paralysis," 370–379.

[x] Antulio J. Echevarria, "Fusing Airpower and Land Power in the Twenty-First Century: Insights from the Army after Next," *Airpower Journal (*Fall 1999): 69. Ibid.; J. C. Wylie, *Military Strategy: A General Theory of Power Control (*New Brunswick, N.J,.: Rutgers University Press, 1967), 23–29, 42–48, 71; Gray, *Airpower for Strategic Effect*, 74.

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[xiii] Clausewitz, Howard, and Paret, *On War*, 119–121.

[xiv] Osinga, *Science, Strategy and War*, 166–172; Watts, *The Foundations of US Air Doctrine*, 119–121.

[xv] Gray, *Airpower for Strategic Effect*, 284–285.

[xvi] Antulio J. Echevarria, "Clausewitz's Center of Gravity Legacy," *Infinity Journal*, Clausewitz & Contemporary Conflict (February 2012): 5–7.

[xvii] Echevarria, "Fusing Airpower and Land Power in the Twenty-First Century," 69.

[xviii] Milevski, "Revisiting J.C. Wylie's Dichotomy of Strategy," 236, 240.

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