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# Wargames: Winning and Losing

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"There are experts of land, sea and air warfare. But as yet there are no experts of warfare. And warfare is a single entity, having a common purpose." -- Giulio Douhet[1]

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The wargames currently being played by the US armed services have come to resemble the most recent engagement of those military forces in live combat in Kosovo: the good guys win convincingly and no one gets hurt. However, before we laud the ability of the services first to simulate a warfighting victory and then to transform the virtual into the real, we need to ask some questions. Are the nation's land, sea, and air wargames structured to produce Douhet's "experts of warfare"? Are the services anticipating the changing nature of future conflict in their wargaming? Are the experiences from those wargames enriching or challenging the services' vision? Are the lessons learned in the wargames played by the separate services being transferred into the joint arena? In other words, when it comes to wargames, who's winning and who's losing?

To address those questions, this article will examine the Title 10 games[2] currently being conducted at US war colleges from the perspective of personal experience as players on the Blue (friendly) and Red (opposing) sides in each of those wargames over the last few years, as well as that of neutral assessors. While applauding many of these efforts, we are principally concerned that the services are winning their wargames but losing opportunities to shape the armed forces for the future.

We need to acknowledge at the outset that wargames are necessarily wide in scope, narrow in application, and broad in purpose. Wargaming, in one form or another, has been around for as long as the armed forces of one nation needed to evaluate plausible offensive and defensive options against those of a potential adversary. As an analytical device, a wargame can stretch across a wide spectrum of employment: investigating near-term geopolitical situations, testing new operational concepts, developing new measures of merit, and determining capabilities and forces required to meet credible future contingencies. Wargaming is a valuable tool, but it can be misused--particularly when attempts are made to guide the future by championing defense programs caught up in contemporary budget battles. Moreover, no single wargame can simultaneously and equally serve to train warfighters, to inform outsiders, to test concepts and doctrine, and to evaluate future force levels. Just as combat requires clearly defined objectives, so does the gaming of force application.

## Playing Wargames

Congress authorizes the US armed forces to conduct Title 10 wargames to investigate the application of military force as it might exist in the future. The US Navy conducts its games at the Naval War College in Newport, Rhode Island (*Global*), the Army at the Army War College in Carlisle Barracks, Pennsylvania (*Army After Next/Transformation*), and the Air Force plays its Title 10 game at the Air War College in Montgomery, Alabama (*Global Engagement*). The Navy's program has emerged from its well-respected Cold War *Global* series, and the Army and the Air Force games are post-Cold War events, each now entering its fifth year.

The mechanics of the games, each typically involving hundreds of military and civilian professionals, are quite similar, positing a future conflict between the armed forces of the United States (occasionally assisted by allies) and a capable, although not necessarily symmetric, adversary. However, where once wargaming results were generated using look-up

tables and manual computation, now combat models and computerized databases bring new dimensions to the art of wargaming. These computer programs can be used to evaluate the results of a massive air battle, the effectiveness of defense against cruise or ballistic missiles, and even the probability of the interaction of two submarines quietly searching for one another in several thousand square miles of ocean. To achieve the desired level of analysis, specialized programs, computer models, and dedicated operators are often sent from interested government agencies to support specific wargame calculations.[3]

The temptation to trust the "fast, accurate, but dumb" computer, unquestioned by "slow, sloppy, but brilliant" humans, is one of the greatest hazards for wargamers. Because specialized computer models do not routinely factor in simultaneously occurring game play, adjudication of their combined outputs requires a fine sense of evaluation and aggregation by expert assessors conversant across a broad range of military skills. Describing most large wargames as "model-aided" is therefore more accurate than terming them "computer-driven." And if major innovations are to occur from wargames or, at least, insights reached as to how new operational concepts might be implemented, they will emerge through the "wetware" developing the "wash-up" (i.e. the humans analyzing how the game unfolded), not from the software driving the spreadsheet.[4]

Because the major wargames are sponsored by the separate military departments under Title 10 responsibility, they have a decidedly single-service orientation to them.[5] Each service uses its own force structure--a projection of the military force and capabilities it may possess in the future--often assuming that other services may not have advanced as rapidly.[6] As a result, Title 10 games feature an understandable focus on service-specific doctrine or tactics, the examination and (perhaps) justification of single-service concepts of operation, and (occasionally) support for a program regarded as central to a service's roles and missions. It is also difficult for service participants, in the heat of the virtual battle, to rise above game-playing to draw larger implications for strategy and long-range planning. A few observations from recently played major service wargames illustrate some of these characteristics.

. *Global*. The series of *Global* games played from 1979 to 1990 had an immense impact on US Navy thinking. These wargames, particularly those under the direction of Chief of Naval Operations Admiral Tom Hayward, are generally recognized as being the genesis of the "Maritime Strategy," the forward naval engagement of the former Soviet Union.[7] However, *Global* has suffered some growing pains in transitioning from its highly respected Cold War series, when a clear threat existed and scenarios were well defined, to the post-Cold War environment where planning contingencies are much more uncertain. As we have noted elsewhere, wargaming seems to provide the most value when the external environment remains relatively stable over the long term and the strategic competition can be quantified with some accuracy.[8] It took the development of the doctrinal framework "From the Sea," and the formation of concepts such as "network-centric warfare" before *Global* could begin contributing to the Navy's vision of conflict in the post-Cold War world.[9]

. *Army After Next/Transformation Wargame*. In the first years of its existence, the *Army After Next* (AAN) series was arguably the most ambitious and imaginative of all the service games. A supporting document for these games, "The History of the Future," was a useful way of establishing the game's scenario. Set 20 years in the future to divorce it from budget issues, AAN investigated the worth of significantly smaller units with vastly improved mobility and firepower. The equivalent, perhaps, of employing supersonic aircraft in wargames of the 1930s, this visionary thrust was well ahead of evolving Army doctrine, and understandably met opposition from the senior Army leadership. As a result, the AAN wargame has been restructured to forecast a 10- to 15-year future and, in 2000, the name of the series was changed to the *Transformation* wargame.[10]

A good thing, too, because the Army is now drawing sharp distinctions between those plans and programs that advance transformation, and those that don't. In the Army's case, similar to the Navy experience, it took separate doctrinal deliberations (and a flawed operational experience with Task Force Hawk in Kosovo) to realign the service vision before it could be tested in wargames. This refocus of the Army's Title 10 game is added testimony to the difficult nature of projecting service requirements based on a changing security environment and an ill-defined adversary.[11] In fairness, it should be noted that the purpose of the *Army After Next* games was not to forecast the future, but "to provide a basis for development and analysis of a long-term vision." [12] By repeating the games, the plan was to conduct comparative analysis as scenarios and adversaries varied over the long term. In this case, however, it appears

that a confrontation with an unpleasant present, rather than the repetitive pull of a coherent vision of the future, was the catalyst providing new direction for Army planning and wargaming.[13]

. *Global Engagement/Aerospace Future Capabilities*. The Air Force *Global Engagement* series and a companion *Future Capabilities* game, directed by the Air Staff, have also suffered from the lack of a coherent view of the future. Developing the concept of "Expeditionary Air Forces,"[14] therefore, was essential in giving the games purpose and substance. This focus on a more traditional deployment of tactical forces was welcomed by the Air Force, which had experimented with the military use of space, extended range operations, and unmanned vehicles in early versions of the game. But these efforts probably had less effect on Air Force long-range planning than the game's designers hoped, owing to the difficulty of redirecting planned investment streams. No matter how revolutionary a platform or system might appear in wargames, if it doesn't fit current force structure, program initiatives, and budgetary ramps, it stands little chance of survival in the real world--unless it is championed by top-level leaders. Thus, Air Force planners emphasizing the capabilities of unmanned and space systems in their wargames acknowledged that these advancements would not be made without significant increases in the budget.

This brief overview suggests that the armed services shouldn't rely on contemporary wargames to develop their long-range vision. Contributions of the *Global* series in developing the Maritime Strategy were unique in considering a relatively short, five-year time span under a constant threat, thereby allowing the iterative development and testing of doctrine and concepts. But the welcome fact that the United States does not now face a monolithic menace should not prompt us to set aside the venerable practice of wargaming. Rather, with credible service visions, if not future adversaries, now well established, we should be examining how wargames can enrich both service and joint strategies.

### **Winning Wargames**

"Winning a wargame" must be carefully defined. The Blue team generally emerges as the ultimate victor in Title 10 games, although that may turn out to be a near-run thing.[15] Much like real wars of late, however, it isn't just the military balance on the battlefield, but a subsequent geopolitical accounting that tallies the final score. Thus, the value of a wargame resides not necessarily in watching the Red opponent lose, but in orchestrating an interaction providing positive and unexpected insights relating to the stated game objectives--often after lengthy and meticulous analysis.[16] On the other hand, if certain capabilities prove decisive in winning the wargame, some immediate post-game analysis is appropriate. Were the scenarios constructed self-serving? Did the models simulating conflict grant certain systems significant advantages? If forces were severely stressed--even to the point of failure--did that event provide fodder for new concepts and doctrine, or was it merely finessed as a game anomaly?[17]

A good indicator that wargames are really being won is when several separately conducted service games, even those with different scenarios and varying time frames, arrive at a similar insight. The following three mutual conclusions we have observed during recent major wargames clearly deserve greater exploration and experimentation in both simulated and real environments.

. *Leveraging Stealth*. Army, Air Force, and Navy wargames have all projected the proliferation of theater ballistic and cruise missiles, as well as advanced air defenses, imposing significant limits on the projection of US military power into a region of interest. This has created an urgent requirement to provide survivable and precise weapon delivery capability in rapidly deployable forces tasked with enabling the entry of follow-on units. Candidates for this role include sea and air platforms whose stealth precludes interdiction and whose precise firepower permits access by friendly forces with much deeper munitions pockets. In a high-threat or anti-access environment, game data support the value of the early use of F-22 and B-2 stealth aircraft, as well as modified ballistic-missile submarines, against enemy missile sites, air defenses, and communication nodes, thereby enabling the arrival and employment of non-stealthy platforms. Yet favorable assumptions often are made regarding the prompt and sustained flow of conventional forces into the theater, and little analysis is dedicated to the effects on enemy capabilities and intentions of intense and sustained firepower delivered early in the conflict from the sanctuary of stealth.

. *Integrating Space*. Another aggregated finding from recent wargames is how tempting it is for Red to attack US space-based assets, such as global positioning system (GPS) satellites. From a gamer's perspective, the root issue is

how to quantify the loss of such space-based capabilities.[18] From a warfighter's viewpoint, the games suggest that orbiting assets are likely to be critical in support of effective military operations. But players on both sides are much less certain about how to play those assets. Wargaming has illustrated the friction between the military need to control (and therefore deny enemy use of) space, and a political unwillingness to cross thresholds in space that could escalate conflict on the earth. There is a tendency to regard space weapons and support capabilities as "silver bullets," left to attack, or to attack from, as a last resort. But holding space as a sanctuary inhibits the examination of the complementary or enabling use of these systems with air, sea, and land-based platforms.

An example is space-based radar systems, often played as a combination of Joint STARS air-to-ground and AWACS air-to-air capability ("JWACS"), providing greatly expanded coverage and reduced risk to platforms and operators. But these optimistic assumptions provide few opportunities to explore the space-based system's limitations--revisit rates, down time as the satellites recharge their batteries, the inability to upgrade the technology on orbiting satellites, the need for rapid re-launch and graceful degradation--or how they will complement and be phased-in with the current generation of atmospheric systems, including unmanned aerial vehicles (UAVs). Near-perfect, space-based JWACS surveillance capabilities suggested by wargames can support service agendas for moving these capabilities to space. But any idealized results must be tempered with an understanding of what technology can be expected when, how new concepts of operation can smooth the transition from legacy to space-based systems, and which alternatives appear most desirable, feasible, and acceptable.

. *Connecting Networks*. *Global 98's* central objective was to have its participants test various characteristics of network-centric warfare, and all of the major service wargames seek to evaluate the implications of seamless system connectivity and enhanced battlefield awareness for warfighting. Most game players believe that integrating the "sensor-decider-shooter" connection is essential to the future conduct of warfare. But a distinction has been revealed between those who believe we can design a top-down, network-centric architecture and then proceed to build it,[19] and another school of thought, developed from a similar gaming experience, that doubts any such architecture could be designed from a clean sheet of paper. What is needed, the latter school argues, is a step-by-step process of system design, with users in the loop, ongoing iteration and experimentation, and a bottom-up approach.[20] To a degree, this graduated path to networked warfighting mirrors the consensus regarding the military use of space just sketched. An incrementalist view emerging from the service wargames argues for a network-centric concept--"battlespace internet" is a recent buzzword--to be developed first by connecting atmospheric networks and systems. An example is a combined single integrated operational picture merging data from AWACS, Joint STARS, U-2, Rivet Joint, Global Hawk, and other platforms and sensors. Then space-based assets, such as a Discoverer II satellite constellation with synthetic aperture radar/moving target indication (SAR/MTI) capability, could be systematically connected to that proven network as they become reliable and affordable.

In contradiction to our thesis that game wins are reinforced by separate and mutual discovery, sometimes a single-service show-stopper from an out-year game identifies certain technologies or desired weapon system characteristics that should be made the subject of intensified research and development.[21] This was the case when it became evident that there was no practical way to provide enough stored energy to operate the *Army After Next's* fighting vehicles for the unrefueled length of time proposed. Prompted by this requirement, investigation has suggested that carbon nanotubes can store thousands of times more hydrogen than any other means, and that an air/H<sub>2</sub> fuel-cell-powered electric vehicle could conceivably approach the required characteristics. An unexpected nugget such as this, if steered into the appropriate acquisition channels, might be among the more valuable products from wargaming.

## **Losing Wargames**

It is easier than one might think for the sponsoring activity to lose a wargame. All it takes is to fail in setting clear game objectives (or setting too many), to allow game controllers and assessors to push a desired outcome (as some even unconsciously tend to do), or to trivialize or ignore the results of the game. Further losses accrue from failing to analyze the findings of Title 10 games for hidden insights and issues by as many entities as appropriate. *Global* and *Global Engagement* results probably should be assessed at Carlisle Barracks, just as the Air Force and Naval war colleges should be reviewing their sister services' Title 10 games. That is, the findings from each service's wargames need to be subjected to cross-examination--*particularly when and where they conflict*. Just as serendipitous mutual discoveries suggest a wargame win, a dichotomy in the way simulated wars are conceived and conducted may indicate

where a real future battle may be lost. Some examples of losing wargames follow:

. *Anti-anti-access*. One of the more contentious issues found in future wargame scenarios is access to the theater.[22] The anti-access challenge to forward force deployment can range from geographical and political constraints to the increasing military-technical capabilities of potential adversaries, including the use of weapons of mass destruction or disruption. Although numerous studies on which wargame scenarios are based suggest that regional adversaries could develop a robust anti-access force by 2010,[23] the major service wargames fail to deal with this issue uniformly. For example, while the US Navy and Marine Corps eagerly engage in wargames where land access is limited and power must be projected from the sea, the Air Force and Army are far less interested in these scenarios. When Air Force wargamers face the need to conduct extended-range operations in wargames, they struggle over accomplishing traditional tasks, such as suppressing enemy defenses and gaining air superiority, from a great distance. But few players in blue suits argue that the USAF should adjust its investment strategy to better balance the number of long-range attack aircraft currently planned in relation to the acquisition of short-range fighters.[24] Therefore, the general post-game reaction has been to support the position, "If we don't have access, we won't go."

. *Garbage in, Gospel out*. The flip side of the positive network-centric issues previously suggested is that the display of game data needs to include a confidence level assigned to its accuracy. We alluded earlier to the argument that the greater complexity and computing power now found in warfighting models bring a loss of transparency.[25] Worse than that, these advances can create false confidence in the technology and tactics being submitted to a testing environment. Two examples illustrate the dangers. In a recent *Future Capabilities* wargame, the support modelers fell hopelessly behind the pace of the day's events owing to unforeseen strategic choices on the part of Blue and Red, as well as untimely computer crashes. The lead assessor in one of the parallel games had no choice but to revert to the "MSU" model--that is, "make stuff up." In this case the assessors referred to pre-game computer runs to bound the problem and to develop a reasonable, if somewhat favorable, estimate of Blue losses from a massive cruise missile attack on forward bases. But at least they were able to explain the rationale behind their damage estimates at the next morning's in-brief.

A similar situation during a recent *Global Engagement* game designed to test--even to stress--an Air Force expeditionary concept could have more serious repercussions. In this wargame, the effectiveness of a small fighter force deployed into primitive forward bases depended on both the high kill probabilities of advanced anti-armor munitions as well as the "just-in-time" air delivery of these weapons at forward locations. To halt advancing enemy ground forces short of their objectives, the weapons had to prove effective and the munitions had to be there when needed. The rub was that extensive RAND research earlier in the year had suggested that against a smart and adaptive adversary in difficult terrain, advanced anti-armor munitions might achieve only a fraction of the advertised kill probability.[26] Nonetheless, throughout the game, assessors estimated results based on pre-game model runs that assumed higher kill probabilities. These back-of-the-envelope assessments misled senior Blue participants regarding the effectiveness of the force in halting the enemy advance and failed to evaluate the logistical aspect of the deployment--ensuring enough munitions were present to support less-than-nominal kill rates. This hidden optimism contributed to the finding that the expeditionary concept proved workable when, in two key areas, it was not stressed at all.

. *The Thundering Present*. To a significant degree, the "fog of peace"[27] is as murky as Clausewitz's "fog of war." Both are encountered in trying to use a wargame to peer into the future while the players are also being pushed by the priorities of the present. One example of the present intruding upon the future occurred at the beginning of the *Global 98* wargame, conducted to explore the themes of "network-centric warfare and naval fires." Each Title 10 wargame, in addition to major and minor players, the assessors, and the game controlling authority, also has various supporting cells to provide expertise and insight in key areas. The Science and Technology Cell's primary function at the *Global 98* game was to provide future projections of technology that could be available to the game players, and to suggest applications resulting from ongoing R&D. Unfortunately, the members of the cell charged with anticipating naval fires capability in 2010 were brought up short by this cryptic note in their game booklet describing future force capabilities: "Arsenal ship was discontinued as an active project and is correspondingly deleted from this list." Thus a real-world procurement decision unnecessarily constrained the game players' projections regarding the capability of a

noncombatant ship maximizing firepower and minimizing manning.

Current doctrine, as well as current acquisition plans, can also contribute to the wargame loss column. In another recent *Global* game, the Blue naval commander, for fear of mines and diesel-electric submarines, chose not to enter a relatively shallow body of water on one side of the peninsula where the conflict was under way, although the shallower side was clearly where naval power could be best employed in defense of the peninsula. As usual, Blue eventually won, but the players lost an opportunity to test survivability in the shallow waters (there were no mines or submarines there, after all). Other losers in this game were those struggling to evaluate and update Navy doctrine for operations in shallow littorals. By many measures, those generating doctrine benefit most from games in which operational actions fail, rather than when they succeed. The simple reinforcement, rather than the challenging, of current operational concepts in out-year games is wasteful at best and dangerous at worst.

## **The Wargames After Next**

Wargames, like service doctrine, technology, and operational concepts, are undergoing an evolution that may result in future wars being fought in very different ways. If wargaming is to contribute to this process, what are some of the positive directions that future Title 10 games might take?

. *Focus on Joint Operations.* Games at the three war colleges naturally tend to be service-centric. That is not inappropriate, if key service issues are to be properly tested and investigated. The Army needs to explore transforming from a heavy to a light force, the Navy has to probe the difficulties of operations in the littoral, and the Air Force must investigate impediments to implementing their expeditionary force concept. Future major US military operations are likely to be increasingly joint, however, and each of these gaming efforts must have credible sidebar play by the other services--logically synthesized from their respective wargaming efforts and overseen by experienced people of appropriate seniority. In addition, each wargame needs external support from other agencies if matters such as space operations and global connectivity are to be believably injected. The degree to which credible modeling of space support has been brought to the Title 10 games is a tribute to a small cadre of individuals who have lugged computers, software, and themselves from one site to another while steadily refining methods and techniques.[28]

While these experts are necessary to gain insight into arcane but crosscutting issues, each service also would benefit from a broad review of its Title 10 and other wargames by its sister services, as well as from joint and interagency analysis. Experienced players from other organizations who are not only less biased toward the approved solution, but also are cognizant of the wishful thinking that tends to promote service roles, missions, and budgets, might provide some of the best insights. Outside agency assessment is a useful way to verify that conclusions drawn from assumptions are not mistaken as facts.

We probably don't need to worry about aircraft carriers being routinely sunk in Army or Air Force games. They are rarely lost at *Global* where, however, low observability isn't played with fidelity and B-2s are downed. Change, if it is to occur, has to be an institutional epiphany--the Air Force will not accept unquestioned conclusions from *Global* that long-range stealthy bombers prove more effective than fighters in anti-access scenarios, nor will the Navy necessarily buy into an Army wargame finding that submarines armed with cruise missiles contribute more to the littoral mission than do destroyers armed with cruise missiles. However, if each war college were tasked with the same scenario, played the wargame from a service-centric perspective, and then watched as their decisions were reviewed and evaluated in another service or joint forum, the benefits of these games would undoubtedly multiply.

. *Stretch the force to failure.* Wargaming can profit by applying concepts of both destructive and nondestructive testing. In industry, if a test objective is to prove that a current product meets customer expectations, then some form of nondestructive testing is appropriate. Tested to these expectations, the product is not supposed to fail. However, if a complex product is to be improved, then the manufacturer often resorts to destructive testing--e.g., driving an automobile without changing the oil for as many thousands of miles as it takes for the engine to seize. The test failure is then analyzed, and some components might be reengineered. During much of the Cold War, *Global* could be viewed as a type of nondestructive testing, serving to validate existing and emergent doctrine for the next five years. Testing the force to failure, however, accelerated the development of the Maritime Strategy. Title 10 games now being played

should similarly include destructive testing, stressing concepts to failure to improve the doctrinal product. Learning through losing wargames can emulate the historical example of nations transforming their military after suffering a major defeat. US armed forces are likely to emerge as winners of those wargames in which Blue players manage to lose in the most elegant and imaginative fashion against a crafty and innovative Red.

A good example of using a wargame to stretch a force to failure already exists in the table-top *Dynamic Commitment* wargames initiated in 1996 to support the Quadrennial Defense Review (QDR), the congressionally-mandated examination of US military strategy and forces. The building blocks for these wargames were a pool of about 50 vignettes, based on historical operations and current contingency plans, calling for the use of military force. *Dynamic Commitment* became focused on what are now termed "Low-Density, High Demand" (LD/HD) assets.[29] Insights from this game noted the fragility of certain specialized units, such as the Air Force AWACS and Joint STARS aircraft and the Navy's EA-6B, when they were tasked with sequential requirements. In the wake of these wargames, the QDR acknowledged that these and other systems were likely to be used at very high operating tempos, but argued that LD/HD assets were being effectively allocated across competing priorities and, specifically, that EA-6B deployments had been stabilized.[30]

There's nothing like a real war to test a wargame--or a policy. Operation Allied Force led to a number of conclusions supporting *Dynamic Commitment* and contradicting the QDR. During the air war over Kosovo, the EA-6B, Joint STARS, and other LD/HD assets were stretched to their limits, bringing into question DOD's ability to forecast and effectively manage such valuable, limited forces, and pointing to the need for increased surveillance, command and control, and electronic combat platforms.[31] Although *Dynamic Commitment* is being played again as a precursor to the 2001 QDR, the previous experience suggests that lessons learned from failed forces, or lost wargames, are difficult to insert in the policy process.[32]

. *Strengthen the link between gaming and experimentation.* In noting the slow pace of the transformation process, DOD's most prominent consumer of wargaming, Net Assessment's Andy Marshall, has argued that it is time to move from games to real experimentation. We agree. But the pace and scope of what is passing for experimentation at the newly established Joint Forces Command is modest, at best. As Senator Joe Lieberman pointed out in a speech at the end of 1999 on transforming national defense, "Joint Forces Command has not yet conducted its first major experiment, and it has not yet made its first recommendation that threatens a core service weapon or role." [33]

There are both budgetary and bureaucratic reasons why this is so. Funding for joint field experimentation is inadequate; Congress cut the requested Joint Forces Command experimentation budget from \$500 million to \$30 million, while approving a combined \$550 million a year for the services' individual experimentation programs. Therefore, the command's J-9 experimentation office can do little in comparison with single-service efforts. And although one goal of joint experimentation, as Senator Lieberman implies, is to identify redundancies among the service's individual efforts, it is clear that service interests, under the current division of dollars and influence, will continue to hold sway.[34]

Wargames could help in setting a joint experimentation agenda by removing redundancies from a simulated battle and quantifying the results. With J-9 having identified 50 agencies and products within the Defense Department working in areas related to finding and attacking mobile targets, using modeling and simulation to begin analyzing the comparative worth of some of these programs seems a reasonable way to advance experimentation. For example, a wargame leading to an experiment could be designed to demonstrate the value of adding space-based SAR/MTI to an existing array of ground-based systems that have greater tactical mobility but comparatively limited range and survivability.

One of the more promising ways in which this gaming-experimentation process has begun at Joint Forces Command is in support of a new operational concept termed "rapid decisive operations" aimed at winning small-scale contingencies by applying joint firepower. The concept's purpose is to explore the rapid deployment of joint forces to enhance conventional deterrence and speed conflict resolution through a series of wargames that might then lead to experimentation.[35] Although these games and experiments are focused on a lesser contingency rather than a major theater war, the concept of designing, wargaming, and experimenting with small, agile forces appears to fit service as well as joint doctrine. Thus, the concept of a joint task force or "vanguard" force, as some have proposed, composed of

traditional units of carrier battle groups, armored divisions, and tactical fighter wings, is likely to incorporate all the inherent problems of current service wargames and prove far too unwieldy and expensive to conduct serious experimentation.[36] A more productive approach would be first to game, then to simulate and experiment with a force composed of an attack submarine supported by unmanned ISR (intelligence, surveillance, reconnaissance) assets, a rapidly-deployable light brigade, and a minimum forward deployment of stealthy air superiority assets backed by US-based long-range strike. That might also provide insight into the future of joint operations, including the ability to project power over great distances with much-diminished logistics requirements.[37]

The quotation introducing this article by Giulio Douhet, an early air power theorist, suggests that we need experts in joint warfare. We believe those experts can be developed and nurtured through the time-tested practice of wargaming—particularly if they learn, along the way, that you can't win 'em all. Losing the next game could help in winning the next war.

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## NOTES

1. Giulio Douhet, *The Command of the Air* (1921), trans. Sheila Fischer (Rome: Rivista Aeronautica, 1958).
2. The "big three" annual, national-level wargames are referred to as "Title 10" games because they are included under the services' "organize, train, and equip" functions under Title 10, US code. See "Title 10 Games Shape Policies," *Aviation Week and Space Technology*, 2 November 1998, pp. 61-62.
3. For an example of how these models have been imported to present wargames with specialized space-oriented computer modeling, see Garret Schneider, Kathy Sadler, and Steve Harrison, "Incorporating Space Systems into Wargames," paper presented at the 66th MORS Symposium, 24 June 1998, Naval Postgraduate School, Monterey, Calif.
4. Paul Bracken and Martin Shubik have expressed concern regarding the tendency to add technical complexity to games because it is easy to do, without consideration as to whether these added technical features add or detract from the game's purpose. They are concerned that the gap between the modelers and real-world policymakers is widening, resulting in lots of computer printouts, but not all that much wisdom. See their "War Gaming in the Information Age: Theory and Purpose," forthcoming.
5. Joint wargames do exist, such as the Joint Land, Aerospace, and Sea Simulation (JLASS), but tend to be played as academic exercises rather than as inputs to future service force planning. See "JLASS Wargame Challenges Players' Real-Time Battle Skills," *Aviation Week and Space Technology*, 2 November 1998, pp. 59-61. For an argument that wargaming should become increasingly joint, see Robert P. Haffa and James H. Patton, "The Need for Joint Wargaming: Combining Theory and Practice," *Parameters*, 29 (Autumn 1999), 106-17.
6. As Robert Killebrew reminded us, the early *Army After Next* games worked very hard to get strong "multiservice" representation by having the other services provide their future force structure. Unfortunately, in the first AAN game, the Air Force didn't have a 2020 force to submit for the wargame.
7. See Admiral James D. Watkins, *The Maritime Strategy* (Annapolis, Md.: US Naval Institute, January 1986). At the beginning of the effort, conventional wisdom held that in a NATO/Warsaw Pact war, the US Mediterranean Sixth Fleet would be destroyed in hours or days, and that the remainder of US naval forces would be ill-advised to transit more than halfway across the Atlantic. Submarines, both nuclear and conventional, would be passively employed in "barriers" in the Greenland-Iceland-United Kingdom (GIUK) gaps. By the time the Berlin Wall came down, the problem with Sixth Fleet was shown to be their having nothing else to do there after the first few days. Nuclear attack submarines were tasked to immediately engage Soviet submarine and surface forces in the Barents Sea, carrier battle groups were operating off the coast of northern Norway, and amphibious units were landing on the western coast of Jutland.
8. Robert P. Haffa, Jr., and James H. Patton, Jr., "Gaming the System of Systems," *Parameters*, 28 (Spring 1998), 110-21.

9. "From the Sea, Preparing the Naval Service for the 21st Century" was published in September 1992. Admiral Cebrowski's article on "Network Centric Warfare" was published in the *Naval Institute Proceedings*, January 1998.
10. See "Army Transformation Wargame Demonstrates Objective Force Capabilities," *Defense Daily*, 5 May 2000, p. 6.
11. Robert Killebrew, "Learning from Wargames: A Status Report," *Parameters*, 28 (Spring 1998), 122-35.
12. US Army Training and Doctrine Command, *1997 Winter Wargame Background and Objectives*, Ft. Monroe, Va.
13. The Task Force Hawk deployment of 24 Apache helicopters to Albania in support of Operation Allied Force became a symbol of the size of the force, the support required, and the length of time it took to get an Army unit ready for employment in a distant region. As the Department of Defense noted in its "After-Action Report," Task Force Hawk was actually an "Army Aviation Brigade Combat Team," including a corps aviation brigade headquarters, a corps artillery brigade headquarters with a multiple-launch rocket system (MLRS) battalion, an attack helicopter regiment, a ground maneuver brigade combat team, a corps support group, a signal battalion, a headquarters troop battalion, a military police detachment, a psychological operations detachment, and a special operations command-and-control element. In all, that amounted to about 6,200 troops and 26,000 tons of equipment to support the Apaches. Clearly the Task Force Hawk experience was instrumental in shaping the Army's plans to be able to deploy a combat brigade to any trouble spot within 96 hours. The Army's *Transformation* games in May 2000 began to test these new concepts. See "War Games Will Test Shinseki's Vision For An Objective Future Force," *Defense Information and Electronics Report*, 11 February 2000, p. 6.
14. See John A. Tirpak, "The Long Reach of On-Call Airpower," *Air Force*, December 1998, pp. 20-26; and Bill Sweetman, "Expeditionary USAF Sets Course," *Jane's International Defense Review*, May 2000, p. 30.
15. Robert Killebrew argues that the "strategic winner in all four service games of 1997 was a hypothetical nation with extra-large land mass, huge population, and a massive army that hunkered down under punishment." Killebrew, "Learning from Wargames: A Status Report," p. 132.
16. For example, during the out-brief of what was to be the last *Global* of the Cold War, a Balkan scenario, two preliminary observations were offered--that the Soviet Union would implode within five years (it was actually five months), and, when it did, Yugoslavia would explode. The majority of players accepted the first, but the second prophetic insight was, at that time, generally viewed with disbelief.
17. There are some examples where wargames provided truly "winning" strategies. For example, while briefing Hitler on the proposed invasion of France from the Ardennes as gamed by the German General Staff in February-May 1940, General Heinz Guderian was asked what he would do if his forces were successful in establishing a bridgehead across the Meuse River at Sedan. He responded, "Unless I receive orders to the contrary, I intend to continue my advance westwards." Hitler nodded. When events began moving as fast as they did, orders actually drafted in support of the wargames were merely re-dated and transmitted. See Alastair Horne, *To Lose a Battle* (London: Penguin Books, 1969), p. 200.
18. Schneider, Sadler and Harrison, "Incorporating Space Systems into Wargames," p. 3.
19. Probably best represented by the views of Admiral Cebrowski. See Arthur K. Cebrowski and John J. Garstka, "Network-Centric Warfare: Its Origin and Future," *Proceedings*, January 1998, pp. 28-35.
20. The Navy's Cooperative Engagement Capability is often advanced as an enabler of "Network-Centric Warfare." See Daniel Busch and Conrad J. Grant, "Changing the Face of War: The Cooperative Engagement Capability," *Sea Power*, March 2000, pp. 37-39.
21. In a recent *Army After Next* game, a 2020 scenario focused on territories adjacent to a large, deep body of water with restricted access. Red, a near-peer competitor, had invaded several adjacent countries to gain control of extensive

oil deposits. Powerful Red naval forces in this body of water effectively precluded Blue naval forces entering serially through the narrow entrance, and necessary seaports and airports in an adjacent friendly country were held at risk from ballistic missile and air attack. Safe logistics transit across the body of water was critical if troops were to be put ashore and supported. Several Blue submarines were the only forces capable of safely entering the inland sea. Upon outbreak of hostilities, as expected, these units managed to eliminate the Red surface naval threat, allowing other Blue naval units to enter with much-needed anti-air warfare and missile defense. An unexpected benefit, however, was the subs' ability from close to Red shores, cued by national sensors, to provide rapid counter-battery fire against otherwise elusive missile transporter-erector-launchers using Navalized Army Tactical Missile System (NATACMS) weapons. However, each sub carried only 12 of these weapons. Since then, a Defense Advanced Research Projects Agency (DARPA) initiative has been established with a goal to significantly increase the payload of the new *Virginia*-class submarine by a factor of at least ten.

22. A common theme across almost every major study of future conflict is the danger that access will be denied to US armed forces attempting to project power into an important region. The most recent of these forecasts is the Phase II report of the Commission on National Security/21st Century. See the Commission's *Seeking a National Strategy: A Concert for Preserving Security and Promoting Freedom*, 15 April 2000, p. 14.

23. For example, see two Defense Science Board studies, the 1995 summer study on *Investments for 21st Century Military Superiority*, and the 1999 DSB Task Force on *Globalization and Security*.

24. Over the next 37 years, the Air Force is planning on buying 333 F-22s and about 1,700 Joint Strike Fighters, but no long-range bombers. In Allied Force, US bombers flew about 320 of the total 10,424 NATO strike sorties, but dropped roughly half the bombs and missiles used during the war, including the through-weather Joint Direct Attack Munition (JDAM) carried by the B-2.

25. Bracken and Shubik argue that complexity has been added to wargaming because it is easy to do technically, but it comes at the expense of transparency. Moreover, the push for computer-based sophistication rarely comes from the people using the wargame to test a concept or a plan. See "War Gaming in the Information Age," p. 2. Their lament is similar to those who complain, albeit on a smaller scale, that the medium of the PowerPoint briefing in the Pentagon has become far more important than the message. See "What's Your Point Lieutenant? Just Cut to the Pie Charts," *The Wall Street Journal*, 26 April 2000, p. A1.

26. Paul K. Davis, "Seeking Leverage for Halting Armored Invasions," a set of three papers supporting the 1998 Defense Science Board Summer Study, *Joint Operations Superiority in the 21st Century* (Washington: Office of the Under Secretary of Defense for Acquisition and Technology, October 1998).

27. See Michael Howard, "Military Science in an Age of Peace," *Journal of the Royal United Services Institute for Defense Studies*, 119 (March 1974), 2.

28. Schneider, Sadler, and Harrison, "Incorporating Space Systems into Wargames."

29. Clarence E. Carter, Philip D. Croker, and Stanley Gornec, "Dynamic Commitment: Wargaming Projected Forces Against the QDR Defense Strategy," Washington, National Defense University, Institute for National Strategic Studies, *Strategic Forum*, Number 131 (November 1997). Today's Joint Staff list of LD/HD assets contains six categories: reconnaissance-battlefield management assets (E-3, E-8, U-2); electronic warfare aircraft (EA-6B and Compass Call); special operations forces; Patriot; rescue aircraft; and chemical/biological defense units.

30. William S. Cohen, *Report of the Quadrennial Defense Review* (Washington: Department of Defense, May 1997), p. 36.

31. This issue is treated in greater depth in Robert P. Haffa and Barry D. Watts, "Brittle Swords: Low-Density, High-Demand Assets," *Strategic Review*, 27 (Fall 2000), 42-48.

32. The second time around may not be much better. See "Services Meet Snags In Readyng Dynamic Commitment War Games," *Inside the Pentagon*, 27 April 2000, p. 1, and "DOD Civilians Crafting Force Options as Military Efforts

are Slowed," *Inside the Pentagon*, 1 June 2000, p. 1.

33. Joe Lieberman, "Transforming National Defense for the 21st Century," US Army Conference on Strategic Responsiveness, 2 November 1999, Washington. JFCOM got out of the starting blocks with its first integrated "rapid decisive operations" experiment in the fall of 2000.

34. Sandra I. Erwin, "Joint-Service War Games Aim to Shape Pentagon Programs," *National Defense*, May 2000, pp. 34-35. See also "Army Leaders Worry More Experimentation Will Slow Service Transformation," *Inside the Army*, 22 May 2000, p. 1.

35. "War Games Planned for this Spring to Test RDO Concept," *Defense Information and Electronics Report*, 4 February 2000, p. 19.

36. See Dan Coats, "Joint Experimentation," *Armed Forces Journal International*, December 1997, pp. 5-7.

37. The Secretary of Defense has tasked the Joint Chiefs of Staff and the Joint Forces Command to develop a plan and an experiment for a "Joint Strike Force" that can deploy quickly to smaller-scale contingencies requiring forcible entry and sustained operations. Such a joint, rapid-response, operational capability was called for in a 1999 Defense Science Board study. See "Cohen Asks Shelton for Quick-Response 'Joint Strike Force' Plan," *Inside the Pentagon*, 11 May 2000, p. 1.

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