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14. ABSTRACT This paper contends that the U.S. is losing it's practical experience in operational art. It explores the current lack of operational art in some commissioning programs. It goes on to illustrate how some Professional Military Education (PME) curriculums address operational art in classroom settings, but have all but removed the practical application phases due to the constraints of accreditation processes. The paper then asserts that shortfall could be mitigated through more war gaming and then illustrates how war games have been used historically to address operational art issues. The paper also illustrates the significant decline in the amount of war gaming in modern day. The paper concludes with a proposal on how the amount of war gaming could be increased in the future through the use of distributed, or networked games. These would allow students doing PME by correspondence to participate in war games as well and would offer the added ability to have students continue to play war games from their follow-on duty locations, thus allowing them to practice operational art every year.					
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**NAVAL WAR COLLEGE
NEWPORT, RI**

**Wargaming and Operational Art – How Do We Increase Our Practical Experience
Level?**

By

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College, the Department of the Navy, or the Department of the Air Force.

Signature:_____

16 May 2003

Introduction

Are we losing our expertise in operational art? The seeming ease with which we have dispatched our last few opponents, coupled with the near-mythical capabilities associated with the still evolving Net Centric Warfare concept should be cause for concern. In our rush to transform we must be careful not to throw the baby out with the bath water. From a purely military perspective, our challenge is to retain our dominance, not just in technology and training, but more importantly in our ability to employ those forces successfully in combat through the proper application of operational art. Future U.S. military leaders must possess both a thorough understanding of, and adequate experience in employing, operational art.

This paper does not include a discussion on whether the unprecedented advance in U.S. military capabilities fundamentally alters the calculus upon which operational art is based. It therefore does make the assumption that it has not fundamentally changed and operational art as we know it is still applicable in the 21st century. The paper begins with an examination of current shortfalls in the methodology being used to prepare U.S. officers to both understand and apply operational art. War gaming offers a solution to help repair the damage done so far and can ensure the maintenance of a healthy level of expertise in the future. The middle section will illustrate how extensive war gaming results have supported (or in some cases been ignored by) planners of major operations for over 130 years. Space constraints do not allow a detailed exploration of every branch of service, or every historical war gaming example. It will conclude with two proposals on how to rectify the shortfalls.

Current Shortfalls in Operational Art Education

Given the overwhelming power and success of the U.S. military in recent years, what could there possibly be to worry about? The answer can be summed up in one word –

overconfidence. We are growing accustomed to winning wars quickly with few casualties. All our recent opponents have been relatively weak and were easily overwhelmed by superior firepower and technology. That firepower resulted in the 100 hour ground war that liberated Kuwait in 1991.¹ Kosovo, Afghanistan, and Iraqi Freedom also yielded unexpectedly lopsided results. But a significant drawback accompanies “easy” victories – the danger that the incorrect lessons were learned. In other words, since the opposition was always so weak, how do we know whether our strategy possessed any dangerous flaws? An overwhelming combat power advantage can easily mask serious flaws in strategy which could lead to a decisive U.S. defeat against a more powerful future adversary. Just because we have not been challenged in the past 25 years, can we afford to assume that our battle plans were flawless? Lack of near-peer enemies means our operational planners have not been “stressed” to the degree they were during WWII.

So exactly how well versed are the current generation of U.S. military officers in operational art? The answer appears to vary greatly based upon the officer’s educational background and experiences. Service capabilities and personalities also definitely play a role. The following paragraphs will illustrate several shortfalls in the military educational process. Again, the scope of this paper prohibits a detailed examination of every commissioning and professional military education (PME) institution.

The USAF has spent a significant amount of time and effort throughout the past fifty years trying to justify the independent capability of airpower. Gen Billy Mitchell sacrificed his career in the 1920s by vociferously advocating airpower. In many ways, Col John Warden did the same thing in the 1990s. Many consider Col Warden an airpower zealot. He believes airpower can win wars alone and served for three years in the mid nineties as

Commandant of Air Command and Staff College (ACSC). He personally presented several briefings to each class espousing his views – including a belief that given just another week or two, airpower would have caused the Iraqis to leave Kuwait in 1991 without need for the ground war.² Operational art was not a term in vogue at ACSC – air campaign planning and strategic warfare were the two things most often stressed.

Col Warden took exception to the traditional war games (combined arms Korean and Southwest Asia scenarios) that the Air Force Wargaming Institute provided to ACSC. He wanted them replaced with a war game that would “validate” his theories of strategic air campaigning using the “5-ring theory”.³ The problem with his request is that he didn’t have any proof that his theory would work, nor did anybody possess the target analysis that would have been required to program the nodes and effects he was looking for. The current ACSC curriculum has stepped back from his extreme views, but at least three classes of students were impacted (to varying degrees) by his philosophies. As a consequence, many of them developed a targeteering mindset rather than an understanding of operational art. Terms like operational fires, phase lines, and operational pause were never mentioned and close air support was virtually unheard of because that implied a need for ground forces. The elements of time, space, and force were minimized, as was logistics – after all, you only needed enough fuel and PGMs to keep the airplanes armed! The 5-ring theory taught students that while it was possible for fielded forces to be a center of gravity; it really preferred to focus on the strategic targets in the inner rings. The main goal was to locate those strategic targets that could win the war without sending in ground forces.

The Naval War College in Newport and the 12 week Joint PME Phase II course at Norfolk both get higher marks for their efforts in teaching operational art, but both of them

could definitely do more. Their main deficiencies stem from a lack of background of their students and the time constraints of the course. Detailed background knowledge of military history makes learning operational art significantly easier by allowing the student to equate operational art terminology to past operations. When it comes time to try and apply the lessons in an actual plan, lessons learned from past operations are invaluable, providing a starting point without the need to “reinvent the wheel”. Of the roughly 100 officers this author has been assigned with in a PME seminar, only one other officer ever professed to be a student of military history. Other students frequently relied on us for help in equating operational theory to past significant events. There are literally thousands of examples from historical operations that can enhance one’s understanding of operational art. Yet, for many of the students going through NWC, the three months spent in the Joint Military Operations course may well be the only exposure they will ever get to operational art before being thrust into a situation where they have to plan a major operation – or are retained as faculty members to teach the material! Even with the excellent summary material that is provided in the course readings, these students will only receive a cursory exposure to operational art. Their only chance to “practice” will be the one or two war games they play in class – and that will not be nearly enough.

So why do so few active duty officers have a background in military history? The answer for the Air Force is that military history is not emphasized in our commissioning programs. Air Force ROTC teaches some basic airpower history, but not in exorbitant detail. It is more of an introduction to expose the student to airpower and give them a feel of how it all evolved, but we certainly do not expect the cadets to be able to espouse Air Force doctrine when they graduate. The main emphasis for a cadet is to make sure they complete their

college degree – and the Air Force has been big on technical degrees for at least the past 25 years.⁴ You rarely ever find a cadet majoring in History that receives a scholarship! Once commissioned, the Air Force is most concerned that young company grade officers master their assigned weapon system first. We are not concerned with them learning the nuances of operational art early on. Air Force officers are never really encouraged to study military history either. Conversations with numerous naval officers here in Newport indicate that the Navy feels pretty much the same way about history as the Air Force. They have a similar emphasis on technical degrees. The Navy also apparently regards PME in general as far less important than the Army, Air Force and Marines. The Army appears to do a better job. All you have to do is look at their doctrine and you will find numerous historical examples interspersed within the text.⁵ The Army ROTC program has a much more flexible scholarship system which allows each Detachment Commander the authority to award scholarships at his/her discretion. An Army ROTC Detachment CC can freely award scholarships to students in any major, including non-technical degrees like History.⁶ The bottom line is that at least the Air Force and Navy appear to have an officer corps of primarily technicians, thus lacking background knowledge in military history. This does not bode well when we add in the time constraints faced by the current PME curriculums.

The time constraint is largely induced by the accreditation process. In order for the PME institutions to award a Masters Degree, there are certain academic standards that must be accomplished. The down side is that it leaves precious little time in the schedules for war gaming. In the 1932 NWC curriculum “From 2 July to 20 May, 304 out of 326 days were devoted to the Game.”⁷ Admittedly, a great deal of that time was devoted to tactical war games – 127 days – but 124 days were devoted to Operations Problems and 17 to Strategic

Exercises.⁸ The 2003 class at NWC will spend only two weeks playing a single war game. The benefit any student gains from a war game is very much an individual issue. In many war games the tendency is for a small number of students to have the key roles and thus to do the majority of the work.⁹ The time pressures to complete each move are often so great that the players do not have the time to share their expertise with their classmates. It has been this author's experience that most players might learn something about their individual piece of the war game, but very few have an opportunity to grasp the larger picture. A final drawback is that in any given PME seminar, it would be extremely rare to have an officer from each career specialty that has a key role in the war game. Thus, it is an extremely common occurrence for at least a few players in each seminar to be playing roles in which they possess no, or extremely limited, expertise. This can lead to some questionable strategies that can ultimately contribute to erroneous lessons.

The time constraint is further exacerbated by the schedule itself. Often the war game occurs during the final week or two of the course – the capstone event. That was the case at ACSC, JPME Phase II, and here at NWC. Logically this makes a certain degree of sense as the students have to be exposed to all of the course material before they are ready to try to apply it. Unfortunately, the last week also tends to be the time when the student is most distracted. They are worrying about getting household goods packed, family members moved, and preparing for the next assignment. Their future success depends on how well they do in that next assignment, not on how well they do in the final war game. And if all that isn't enough, the war game exercises are seldom graded. After spending an entire year trying to meet all the graded graduation requirements, an ungraded exercise the week before

the end of the course suffers in most students' priority list. This is not meant to sound like a typical student "whining", but it is none-the-less a fact that does indeed impact the situation.

The bottom line is that simply attending and completing ISS or SSS in residence does not magically qualify any student to plan and conduct an operational campaign, or to remain assigned as a member of the faculty. Despite the best efforts of the instructors, a few months simply is not enough time to address all of the issues and gain the experience required to become an expert in operational art. The task is nearly impossible if the student does not possess a background in military history to begin with. The skill of application is what is missing – and this is where war gaming needs to re-enter the picture.

The reader may notice different spellings (war game as opposed to wargame) throughout the paper. Like many things in the joint arena, even the spelling and definition of war gaming is controversial. In 1993 the Air Force Wargaming Institute was spelled as a single word. The commercial wargaming industry still uses the single word today. But much of DoD and most early authors use two words (war game). In an attempt to ease confusion, this paper will use the two word (war game) method unless directly quoting a source that uses the single word (wargame) or referring to the Air Force Wargaming Institute. This paper will also avoid being drawn into the extensive debate about just what does and does not constitute a war game. This simple definition from a commercial wargame book is sufficient: "A wargame is an attempt to get a jump on the future by obtaining a better understanding of the past."¹⁰ It doesn't matter what kind of war game it is. The important part is that there is someone who understands operational art to guide the students through the game and ensure they are learning the correct lessons.

War Gaming as a “Teacher” of Operational Art

Assuming the arguments presented so far that there is a lack of practical application experience in today’s officer corps are convincing, why should we believe war gaming can help? Admiral Raymond A. Spruance served three tours at the NWC before WWII and a fourth as the commander following the war. He was definitely a proponent of war gaming:

“Spruance was intellectually stimulated by naval warfare problems, in the same way that a mathematician is stimulated by complicated calculus problems. He evaluated hundreds of student solutions as a War College staff officer, and his faculty for analyzing and solving problems became instinctive. When later confronted with the crisis and complexities of the Pacific war, he could resolve them systematically and effectively.

He would treat the war in the Pacific with the same emotional detachment that he treated war games in Newport.”¹¹

In other words, through constant repetition and practice, Spruance developed a “natural” ability to solve complicated battle problems due to his extensive background in war gaming and because of his study of military history. That interest was initially cultivated as an NWC student and then perfected as a faculty member. His impressive war record (Midway, the Marianas, Iwo Jima, and Okinawa) attest to his outstanding ability to command at the operational level of war.

A commander must possess the ability to think clearly in a stressful situation. Successful application of operational art also requires the assimilation of very complex ideas that can best be grasped through application itself. Properly designed and executed war games offer the opportunity for repeated application. A good war game is essentially a living story or drama and as such has a much greater learning impact than a lecture or merely reading a book.¹² The student “lives” the experience, including the stress and emotion that goes with it. There are consequences to every decision, and war games drive that point home clearly, for example when the student’s forces suffer heavy casualties. Negative results are often quite sobering and usually cause students to pay closer attention. The following

paragraphs will examine a few historical cases where war games were used, illustrating how important operational lessons were learned or ignored.

Moltke and the German general staff had studied the limitations that early 19th century European roads had imposed upon Napoleon and realized that the railroads would vastly increase logistics capability, allowing much larger armies to be concentrated and sustained. So Moltke created a railway department and held the first major exercise involving this department in 1862.¹³ Over the course of the next few years, his staff was able to perfect the deployment and logistics plans that ultimately led to victories over both the Austrians in 1866 and the French in 1870-71. In both wars, the Germans were able to concentrate more combat power at the decisive point more rapidly than either the Austrians or the French. “The outcome of the Franco-Prussian or Franco-German war was never in doubt.”¹⁴ Railroads were not the sole reason for German success, but by perfecting doctrine for the use of a new technology and using war gaming to test it, they were able to shape the battlefield and create a highly advantageous force ratio situation that contributed significantly to victory. War gaming allowed them to perfect the sequencing of the arrival of forces.

The Russian General Staff played a series of war games in April 1914 to test their plan for operations against Germany but failed to incorporate the lesson learned. “The war games, waged according to the plans, revealed the existence of a weakness that would prove fatal should the Russian Second Army start too late in an invasion of Germany.”¹⁵ The war games also speculated this weakness could be overcome by merely starting the second army three days sooner, but this change was never made to the operational plan. The Germans were also war gaming the same scenario as a test of their Schlieffen plan. They identified this same potential Russian vulnerability. Hausrath writes that these war games led directly

to the decisive German victory at Tannenberg – but that may be a bit simplistic as there were other mistakes and missed opportunities that also might have altered the outcome. Hausrath writes:

“Each of the contending nations had gamed the same situation, and with the same results. The generals of one nation meticulously applied the lesson of the games and won a decisive victory over the numerically superior forces of the opposing nation whose generals failed to apply the critical lesson the games had demonstrated.”¹⁶

If we accept his conclusions, then the Germans clearly took advantage of the factors of time, space, and force. The numerically superior Russians were critically vulnerable to an attack during that very brief period they were separated. If Germany had not war gamed the scenario, they might have missed this fleeting yet decisive opportunity. Furthermore, had the Russians merely corrected the flaw, they may well have been nothing the Germans could have done about the situation. War games still have this same capability today – they can be invaluable in helping us identify critical opportunities and vulnerabilities.

The Germans continued to make use of war games throughout WWI with perhaps the most well-known example being the gaming done in support of their final offensives in 1918.¹⁷ The games clearly demonstrated there was little hope of success, but the Germans launched the offensive anyway. Despite the failure of their plan to “win” at the strategic or even operational level of war, the new German tactics took advantage of several principles of war (surprise, mass, economy of force, maneuver, and security) to introduce a new style of mobile warfare and demonstrate that it was possible to overcome the static nature of trench warfare.¹⁸ These new tactics did indeed catch the British by surprise and resulted in some of the largest territorial gains to occur since the onset of trench warfare. More importantly, the limited success served as a catalyst to the development of mobile warfare which would eventually evolve into what we in the western world refer to as the *Blitzkrieg* tactics¹⁹ used so

successfully in World War II. The heyday of war gaming, the interwar period saw the evolution of *Blitzkrieg* tactics, constantly rehearsed, refined, and perfected with the aid of war games.²⁰ A properly conducted *Blitzkrieg* is arguably the classic example of operational art. It encapsulates literally every aspect of ground and air warfare with the possible exception of strategic air attack. German development of the *Blitzkrieg* concept used war gaming to help lay the foundation for what we understand as operational art today.

Paulus and Stalingrad by Walter Goerlitz provides a detailed account of German war gaming in support of Barbarossa. Numerous critical problems were illustrated, including the barely adequate force ratios and the total lack of a reserve. It clearly articulates how the General Staff and Hitler could not even agree on the objective. The army favored a focus on Moscow with an aim to surround and destroy the Russian army. Hitler favored the flanks – Leningrad and the Caucasus. He felt the former would have serious political ramifications for Stalin and the latter economic.²¹ They wound up trying for all three (no unity of effort here) with the consequent failure to achieve any,²² ultimately resulting in Germany's defeat.

German war gaming was so prevalent that on several occasions key officers were actually off participating in war games to anticipated allied operations when those operations commenced. One such occasion has even been immortalized in motion pictures – the Allied invasion of France in 1944. A better example might be a game played in early Nov of 1944. Fifth Panzer Army was conducting a war game to “rehearse the defense measures against a possible American attack against the boundary between the Fifth and Seventh armies.”²³ The war game had barely begun when the American attack began. The situation quickly became so critical that the reserve division (the 116th Panzer Division) had to be ordered in. The commanding general of that unit was present and playing in the game, so he began

issuing real operational orders using the game, right from the war game table. As a result, the 116th Panzer was able to move and engage in record time.

Admiral Doenitz conducted a highly informative war game in 1938 to determine the force structure and command control measures he would need to conduct successful unrestricted submarine warfare against Great Britain.²⁴ This game not only predicted the necessary force structure, but also correctly anticipated the British would adopt the convoy system. This game demonstrated a particularly impressive understanding of time/space/force and operational tempo. Doenitz envisioned that at any one time 100 U-boats would be in refit and overhaul while the crews rested, recuperated, and trained new sailors. He also further concluded that an additional 100 U-boats would be in transit either to or from their patrol areas and therefore not available for patrol. That left 100 U-boats on station at all times to attack Allied shipping. It would appear this force would have been sufficient to operate continuously for some time – at least long enough to win the battle. In other words, no operational pause would have been needed. Given the massive distances of the Atlantic Ocean, this showed an outstanding grasp of the time/space/force interrelationship. It appears the Allies were lucky that Germany never attained the U-boat levels that Doenitz desired.

Perhaps no Axis operation was war gamed more than the opening Japanese moves of the Pacific war, including the attack on Pearl Harbor. It is interesting to read the results of the various war games.²⁵ The first few times the attack was played out the Japanese forces were detected before they could strike Pearl Harbor. Large numbers of interceptors were awaiting the attackers and little damage was inflicted upon the islands or the U.S. fleet. The subsequent counter-attacks destroyed about one third of the attacking carriers. The Japanese took these initial lessons and kept adjusting the plan until they discovered a method of timing

and approach (again, factors of space and time) that maximized their likelihood of achieving surprise. Their final war game was wildly successful, sinking four battleships, two carriers, and three cruisers – all for the loss of one Japanese carrier. This war game helped Yamamoto convince his skeptics that his plan was feasible and worth the gamble. However, it may also have taught the strike force commander Nagumo an unintended lesson – that a quick strike followed by an immediate and hasty retreat were the keys to success. Did this unintended lesson influence him on 7 December when he chose to retire after his successful first two strikes? Many historians have criticized him for not launching additional waves of aircraft to polish off crippled ships, and to destroy the oil storage and repair facilities that he left intact. It also illustrates another danger – flawed intelligence assumption. Japan assumed that the U.S. carriers would all be in Pearl Harbor too. Their absence was critical and those same carriers became the basis of all U.S. actions in the early months of the war and would lead eventually to the battle of Midway.

The Japanese also war gamed the Midway plan and here we see another classic example of what can happen when results are ignored, or worse, tampered with.²⁶ Midway Island did not fall in the originally conceived Japanese defense perimeter. But the success of American carrier operations and the surprising Doolittle raid²⁷ convinced Japan they needed to expand their perimeter farther and seek to destroy the American carriers once and for all. A number of factors led the Japanese to overestimate their own capabilities such as victory disease, an overestimation of damage inflicted on the U.S. fleet, and over reliance on their deception plan just to name a few.²⁸ The war game was played, and several glaring problems were revealed. The first problem occurred when American land-based air was adjudicated to have attacked and sunk the two largest Japanese carriers. The umpire reversed

the decision and both carriers survived. A second problem was the fact that nobody had any contingency plan to deal with an American carrier if one were to turn up. Despite specific guidance to develop such a contingency plan, they never really did. Of course, Japan did not realize that the U.S. had broken their naval codes and hence knew their plan. This allowed the three U.S. carriers to be on station awaiting the arrival of the Japanese fleet and the result was the destruction of 4 Japanese fleet carriers at the cost of the *Yorktown*.

But when it comes to war gaming, nobody did more than the U.S. Navy. “In the archives of Newport, 318 recorded game histories remain. . .for the entire interwar era, 1919-1941.”²⁹ “The prime motive for playing war games was to provide mental exercise so as to develop sound judgment.”³⁰ Also, recall the earlier quote about 308 days of gaming in the 1932 senior course schedule. It certainly appears that the main emphasis of the college was on war fighting. Carrier aviation assets appeared in the first war game in 1921.³¹ The U.S. Navy also conducted massive annual fleet exercises and in 1929 the *Lexington* and *Saratoga* demonstrated the vulnerability of the Panama Canal to carrier aviation.³² Perhaps the most infamous fleet exercise occurred in 1938 when *Saratoga* launched a successful surprise attack on Pearl Harbor – a lesson not lost on the Japanese who would replicate it three years later!³³ Today’s curriculum only has time for a tiny fraction of this “practical application”.

One other aspect about this interwar time period at the Naval War College is particularly noteworthy. Many of the war games involved wars with Great Britain and her colonial allies (including Canada). Classes as late as 1938, 39, and 40 all played at least one war game against Great Britain.³⁴ “Although these exercises at Newport reflected institutional convenience and not the prospect of use, they did reinforce the Navy’s attention on the Atlantic.”³⁵ This is particularly significant because it addresses another current

problem with U.S. war gaming, lack of a credible peer. Most recent war games tend to focus on smaller contingencies where the U.S. has overwhelming superiority. While this provides some utility in familiarizing students with potential future opponents, having overwhelming superiority all the time can create a situation where you grow complacent. Small errors are easily overcome, meaning you do not have to plan as carefully to ensure victory. In other words, you can be a bit lazy with your operational planning and still prevail. Shouldn't we look at a scenario where we fight a coalition that does have modern weapons – like for example NATO? The point is not so much whether such an event broaches reality, but rather to challenge ourselves to truly learn and apply the lessons of operational art. By war gaming against the British (regarded as the most powerful fleet in the world at that time), it forced the Navy to consider factors they were not considering when war gaming against the much smaller German or Italian fleets. The way to get better is to practice against the best.

Possible Solutions

As previously stated, war gaming can provide a vehicle for officers to gain practical application experience. But we must always remember that simple human error or poor use of doctrine can drastically alter the outcome of a single war game. The fog and friction³⁶ of war can impact outcomes in war games just like in real life. The British battle cruiser *Hood* was sunk by a single shot from the *Bismarck*.³⁷ If that shell had impacted just a few feet away from where it actually did, it is quite conceivable that she would not have been destroyed -- at least not outright. Most war games do account for fog and friction and sometimes a single "lucky" event can dramatically alter the course of the game. This is another reason why playing a game more than once is so important -- to mitigate the effects of events that would otherwise be several standard deviations away from the mean. While a

significant increase in war gaming time at PME would seem to be the obvious solution, this does not appear to be a feasible solution given the current schedule constraints.

Commercial wargaming may have the answer. Recent commercial computer wargames have been taking advantage of networking to allow players the ability to log-in and “fight” each other in networked games. An Air Force 2nd Lt was recently relating his experience with a WWII air combat simulation that he and his buddies play. They enter the game as newly arrived fighter and bomber pilots and begin flying actual combat missions on-line against other live players. The longer they play, the more experience they gain, and eventually they can move up to become the squadron and group commanders who actually plan and lead the missions. He is learning about warfare, granted at the tactical level now, but the potential is there to learn at higher levels later. AFROTC recently purchased a flight simulator program for each ROTC detachment that has a similar networking capability to allow cadets at one Detachment to “fly” against cadets at other Detachments. There is no reason why this same networking capability could not be used with naval and ground combat as well to supplement PME. With a little time and involvement from the various PME institutions, a similar networked PME war game could be created. This would have the added advantage of allowing those students doing their PME by correspondence to actually interface with other students and faculty. Students in both programs would benefit! Imagine a combined arms, operational campaign. A self-paced tutorial program could be written to teach the students how to use the game controls (much like current commercial wargames already possess). The students would also have already completed certain portions of JMO material. Then, at a set time (for example -- Wednesday at 1300), the students simply log-in and the game begins. Chat rooms could be included so the students from each side can

exchange ideas, etc. The PME institutions would need to provide moderators that could "watch" the game and record lessons learned. At the conclusion of the days gaming, there could be a final chat room where the students could all go to get a critique from the instructors and discuss the events. If that is not possible, the instructors could prepare comments over the next 24 hours and email them to the participants. There is no reason why a series of war games could not be designed that would allow the students to network together and practice operational art. Best of all, the war game could be played repeatedly, and ideally continue even after the students report to their next duty location.

It is ultimately up to each PME institution to develop a curriculum appropriate for students who arrive with a positively staggering difference of backgrounds and experiences. The declining emphasis on war gaming appears to contradict the lessons that we should have learned from WWII. Many operational level victories were positively affected by war gaming experiences, but unfortunately, nobody can say to exactly what level. Could all of those operations have succeeded without any war gaming? – Theoretically the answer is yes. For these exact same reasons it is impossible to prove the role war gaming plays today in gaining operational experience for our officers, just as it is impossible to prove whether there were shortfalls in our operational art in recent conflicts. Absent a disastrous defeat on some future battlefield, absolute proof of this thesis may never be possible. The only thing that is certain is that the NWC is devoting a significantly smaller amount of time to war gaming than they did prior to WWII and the other war colleges appear to have adopted pretty much the same model. The inherent dangers in learning the wrong lessons from the single playing of one war game should be cause for concern. Short of adding more war gaming time to the curriculum, networked war games appear to be the most viable future substitute.

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Endnotes:

¹ Rick Atkinson, *Crusade, The Untold Story of the Persian Gulf War* (Boston: Houghton Mifflin Co. 1993), pp. 469-481.

² I vividly recall these briefings – and the resulting, highly contentious discussions we had back in the seminar room immediately following them. There were a lot of students that did NOT agree with Col Warden (myself included).

³ The source for this material is a series of meetings that I attended while assigned as a staff member of the Air Force Wargaming Institute when Col Warden was present and making his requests.

⁴ During my stint as an AFROTC Det Commander, I could automatically offer scholarships to any student majoring in certain engineering disciplines or meteorology as long as they could pass the physical exam and had at least a 2.65 GPA. Students in other technical degrees routinely earned scholarships with GPAs in the low 3.0s. Yet students in non-technical degrees often were not able to earn scholarships with much higher degrees – for example, I had one student with a GPA in excess of 3.7 that was majoring in physical education and he was turned down by the ROTC national scholarship board.

⁵ Department of the Army, *Field Manual 3-0, Operations*, Jun 2001. Examples abound – like p 7-8 which covers the Inchon operation and 7-9 which covers Desert Storm.

⁶ As an AF ROTC Det CC, I lost several potential cadets to the Army because they had non-technical majors (such as history, geography, and physics) and the Army could guarantee them scholarships that I could not.

⁷ Michael Vlahos, *The Blue Sword, The Naval War College and the American Mission 1919-1941* (Newport, RI: Naval War College Press 1980), 133. Appendix III of this book contains an 11 page index of these games.

⁸ Ibid, p. 134.

⁹ This comment is based upon my observations during 17 months assigned to the Air Force Wargaming Institute where I supported and critiqued approximately 100 different seminars and other groups playing PME wargames.

¹⁰ James F. Dunnigan, *The Complete Wargames Handbook, Revised Edition* (New York: Quill William Morrow 1992), 13.

¹¹ Thomas B. Buell, *The Quiet Warrior, A Biography of Admiral Raymond A. Spruance* (Annapolis, MD: Naval Institute Press 1974), p. 60.

¹² Peter P. Perla (guest lecturer) and Robert C. Ruble, Class lecture notes and briefing slides, Elective WE599 *Wargaming Theory and Practice*, U.S. Naval War College, Newport RI, (Dec 02 – Feb 03).

¹³ Walter Goerlitz, *History of the German General Staff 1657-1945*, Translated by Brian Batteshaw (New York: Praeger 1953), pp. 73-77.

¹⁴ Colonel T. N. Dupuy, *A Genius For War, The German Army and General Staff, 1807-1945* (McLean, VA: Nova Publications 1984), p. 97.

¹⁵ Alfred H. Hausrath, *Venture Simulation in War, Business, and Politics* (New York: McGraw-Hill, 1971), p. 23.

¹⁶ Ibid, p. 25.

¹⁷ Peter P. Perla, *The Art of Wargaming* (Annapolis, MD: Naval Institute Press 1990), p. 41.

¹⁸ Dupuy, *A Genius For War, The German Army and General Staff, 1807-1945*, pp. 170-175.

¹⁹ For an interesting discussion of the *Blitzkrieg* terminology, see Matthew Cooper, *The German Army 1933-1945* (New York: Stein and Day 1978), pp. 115-117. The Germans did NOT use the term in their manuals.

²⁰ Hausrath, *Venture Simulation in War, Business, and Politics*, p. 26.

²¹ Walter Goerlitz, *Paulus and Stalingrad*, Translated by Colonel R. H. Stevens (New York: The Citadel Press 1963), pp. 106-107.

²² Cooper, *The German Army 1933-1945* provides additional detailed descriptions of the entire Barbarossa campaign in chapters 18 – 20, pp 259-338.

²³ Three different sources record this event. The quote comes from Hausrath, *Venture Simulation in War, Business, and Politics* p. 27. Perla, *The Art of Wargaming* also covers this on p. 44 and Francis J. McHugh, *Fundamentals of War Gaming*, 3d ed. (Newport, RI: Naval War College Press 1966) pp. 2-17 – 2-18.

²⁴ Grand Admiral Karl Doenitz, *Memoirs, Ten Years and Twenty Days*, Translated by R. H. Stevens in collaboration with David Woodward (London: Weidenfeld and Nicholson, 1959; reprint, Annapolis, MD: Naval Institute Press 1990), pp. 32-35 (page citation is to the reprint edition).

²⁵ Gordon W. Prange in collaboration with Donald M. Goldstein and Katherine V. Dillon, *At Dawn We Slept, The Untold Story of Pearl Harbor*, 50th Anniversary Edition (New York: McGraw-Hill 1981; 50th anniversary edition, New York: Viking Penguin 1991), pp. 223-231.

²⁶ Two excellent sources discuss the Japanese Midway war game. The first is Gordon W. Prange in collaboration with Donald M. Goldstein and Katherine V. Dillon, *Miracle at Midway* (New York: McGraw-Hill 1982; reprint, New York: Penguin 1983), pp. 30 – 39, 69 – 71. The second is Mitsuo Fuchida and Masatake Okumiya, *Midway, The Battle That Doomed Japan*, Edited by Clark Kawakami and Roger Pineau (Annapolis, MD: Naval Institute Press 1955; reprint, New York: Ballantine Books 1983). The first 90 pages provide an insight into Japanese naval strategy and pp 90 – 94 discuss the actual war game (page citation is to the reprint edition).

²⁷ Fuchida, pp. 66-72.

²⁸ Samuel Eliot Morison, *History of United States Naval Operations in World War II, Vol IV, Coral Sea, Midway, and Submarine Actions* (Boston: Little, Brown, and Co, 1949; reprint, Boston: Little, Brown, and Co, 1989), pp. 74-79 (page citation is to the reprint edition).

²⁹ Vlahos, Michael, *The Blue Sword The Naval War College and the American Mission 1919-1941*, p 133.

Appendix III of this book contains an 11 page index of these games.

³⁰ Hattendorf, John B. et al, *Sailors and Scholars The Centennial History of the U.S. Naval War College*, page 154

³¹ Morison, Samuel Eliot, *History of United States Naval Operations in World War II, Vol I, The Battle of the Atlantic* (Boston: Little, Brown, and Co, 1947; reprint, Boston: Little, Brown, and Co, 1989), pp. li (page citation is to the reprint edition).

³² Ibid, p. lii.

³³ Ibid, p. liii.

³⁴ Ibid, pp. 176-177.

³⁵ Baer, George W., *One Hundred Years of Sea Power* (Stanford, CA, Stanford University Press 1994), p.90.

³⁶ Carl von Clausewitz, *On War*, Edited and Translated by Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), pp. 119-121.

³⁷ Ludovic Kennedy, *Pursuit, The Chase and Sinking of the Bismarck* (New York: The Viking Press 1974), p. 85 – 87.