



Future Directions for WARGAMING

By PETER P. PERLA

Wargaming at the Air University.

U.S. Air Force

The early 1990s have witnessed political, military, and technological change which at times has seemed dizzying in scope and scale. The Soviet nemesis that loomed on the international scene for more than four decades has collapsed in political and economic disarray. The Russian phoenix arising from the ashes is enigmatic and unpredictable. Former states of

the Warsaw Pact actively seek membership in NATO, partly in fear of a resurgent, virulently nationalistic, and potentially expansionist Russia. In the Persian Gulf a U.S.-led coalition waged what some described as the first high-tech conflict, one that was quarantined by American seapower, dominated by American airpower, and terminated by American armor. Military technology and concepts that

Summary

The opportunity exists to shift military planning away from the global war envisioned only a few years ago to ragged little conflicts that appear to be the biggest threats today. Operational analyses, field exercises, and wargames teach important lessons, with wargaming in particular helping create cross-service awareness. But enthusiasts must resist an overreliance on games—wargamers have been known to be dazzled by mechanical aspects of seemingly realistic combat situations and in the process to largely overlook the players. The best designed games may closely approximate reality while poor ones mislead and can exact a high price in lives as occurred at Guadalcanal following flawed wargaming at the Naval War College during the 1930s. As wargames continue to play an inevitable part in planning future contingencies, participants must avoid being beguiled by high-tech gadgetry and focus on the human agents who make decisions in wartime.



U.S. Air Force

Air Force Wargaming
Center at Maxwell
Air Force Base.

received a baptism of fire in Desert Storm—the Tomahawk cruise missile, Joint Surveillance Target Attack Radar System (JSTARS), and Joint Force Air Component Commander (JFACC)—promise to lead the Armed Forces into uncharted waters.

To deal with constant change in the geopolitical and military environment, policymakers, strategists, analysts, and operators are all looking for means to overcome the clouds of uncertainty that obscure the future.

wargaming is focused
on the dynamics of war
and on the interplay of
human decisions

As defense budgets decrease, it becomes more critical than ever to identify new technological, operational, and political directions that will become most profitable to pursue. The services can no longer go their

own way in research, development, and acquisition. As truly integrated joint operations become the norm rather than the exception to the rule, the Armed Forces must find the tools to help them fit together seamlessly—doctrinally, technically, and operationally.

In a quest for such tools, many turn to wargaming. Because of its nature and long history, wargaming may seem an alchemist's

stone that can transform uncertainty into prophecy, indecision into insight. From the potentialities of futuristic technologies to the possible implications of ancient animosities, wargaming tantalizes us with the apparent power to reveal hidden truths and uncover paths that ought be followed.

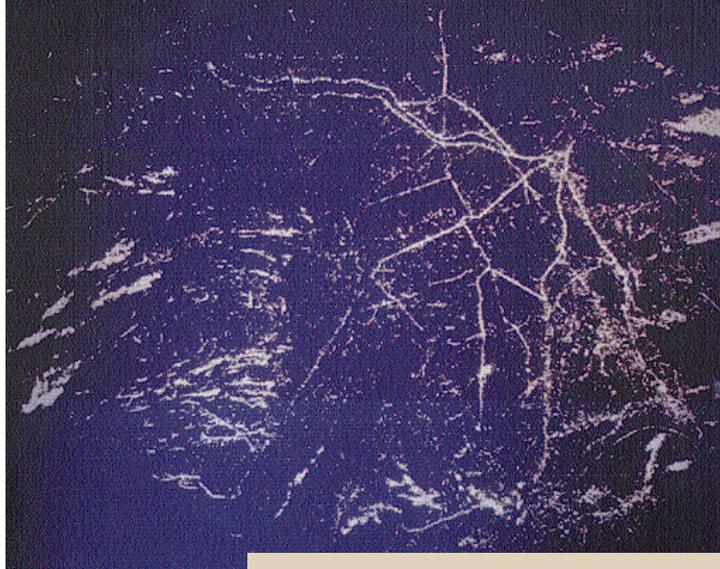
But wargaming is not a panacea. It is only one tool—albeit a powerful one—among many that we can employ to explore a changing world. When used appropriately it can contribute to an understanding of where we are and where we should go. In particular, it can help build truly joint forces from the capabilities of various service components. Misused or overused, wargaming can dangerously lead us to self-fulfilling prophecies and the delusions of self-proclaimed messiahs.

What is Wargaming?

To understand both the potential and the pitfalls of wargaming, one must understand what it is. Often the term is applied to any combat model, from computer simulations to field training exercises. But such a wide definition renders the term meaningless. More precisely, a wargame is a model or simulation of war conducted without maneuvering actual forces, and with a sequence of events that affects—and is affected by—decisions of the players who represent opposing sides.

Wargaming is focused on the dynamics of war and on the interplay of human decisions and possible outcomes of those decisions. Its value lies in the unique ability to illuminate the effects of the human factor in warfare. By nature wargames seek to explore messy, unquantifiable questions that the physical sciences and operations analysis must ignore. Learning what a game has to teach requires exercising qualitative disciplines associated with good analytical history, not quantitative techniques more often associated with science and operations research. Wargames teach us what we did not know that we did not know. And given all of today's uncertainties and questions, such a tool is invaluable. Indeed the potential value of wargaming manifests itself as a tool for education and training, a device to help develop and explore new concepts and operational plans, and an aid to explaining new concepts and ideas.

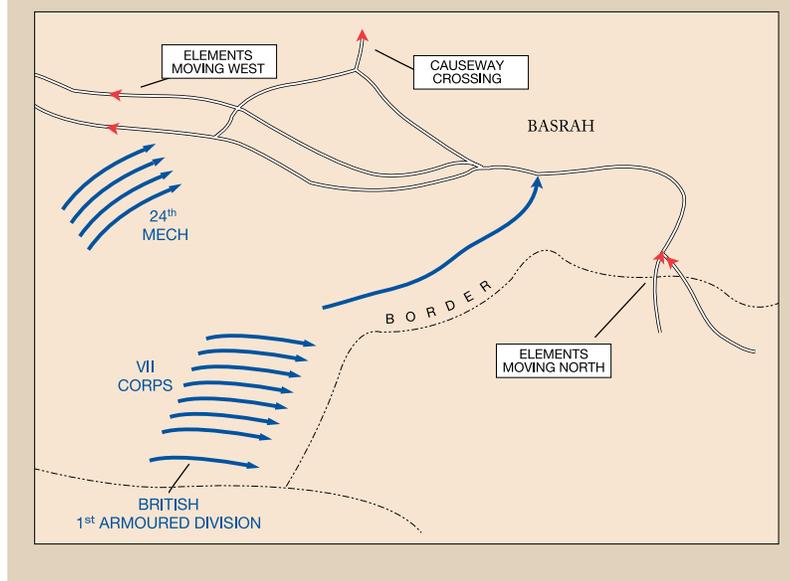
Peter P. Perla is an operations research analyst at the Center for Naval Analyses. His contributions appear regularly in *Fire & Movement* and *The Wargamer*; he is also the author of *The Art of Wargaming: A Guide for Professionals and Hobbyists*.



DOO

Desert Storm: JSTARS display on February 26, 1991, showing VII Corps in attack against Republican Guards and British 1st Armoured Division to south (at lower left) as traffic in Kuwaiti theater of operations moves north toward Basrah, and from that city west on parallel routes south of the Euphrates; the 24th Mechanized Division moves to interdict routes; (top center) traffic moving north across causeway.

Operation Desert Storm (February 26, 1991)



Used in training and education wargames make the participants translate their knowledge of strategy, tactics, or command and control into an ability to carry out their mission more effectively or understand reality more dynamically. For example, a prospective JFACC might be aware of the need to balance resources for air defense against those committed to projecting offensive airpower. By placing students in a wargaming situation in which they must actually manage the balance when faced with an active and aggressive opponent, instructors can demonstrate the problems associated with command as well as enable the students to discover the consequences of success or failure.

An exploratory tool, wargaming provides players and analysts, observers and participants, with new insights which can

lead to further investigation of the validity and sources of their views. Wargaming compels participants to look at reality from different perspectives and to fundamentally change the way in which that reality is perceived. If the initial design of a game incorporates well known critical factors into the models and procedures, the play and the issues raised can lead to the discovery of other factors which may have been previously unsuspected or undervalued.

By allowing human decisions to influence events made under the press of time and on the basis of imperfect or incomplete information, and by incorporating the caprice of randomness and luck, gaming comes closer than other intellectual exercises to illuminating the dynamics of warfare. By illustrating the effect of these unquantifiable factors in concrete terms, wargaming also helps to illuminate the sources of that dynamism.

In the final analysis, as an explanatory device, wargames can effectively relate historical, operational, and analytical insights. The latest intelligence about operational doctrines and strategic or tactical options of potential adversaries can present commanders with new problems and challenges to find feasible solutions. Wargames can vividly portray the operational implications of advanced weapon systems by forcing the players to deal with the opportunities and difficulties presented, rather than by simply providing numerical estimates of limited technical parameters. Wargames also recreate constraints of knowledge and capability under which commanders have had to operate in the past, giving players and researchers a fresh look at why things happened as they did. Such insights help offset the distortion and intellectual arrogance that too often accompany the gift of 20–20 hindsight.

Participants in wargames are not passive. The interaction of participants with the

Apparent fleet-level action at the Naval War College, circa 1914.



Courtesy U.S. Naval War College Museum

scenario, systems, and each other provides opportunities to develop new insights. The insights can, in turn, prompt more detailed historical, operational, quantitative, and scientific analyses with results which can be incorporated into follow-on games. Such sharing, testing, and revising of knowledge and understanding is fundamental to the productive use of wargaming. It is also one of the reasons that wargaming can be effective in building an interservice appreciation of the full range of capabilities and vulnerabilities of a joint force.

Some Cautionary Notes

The power of wargaming to communicate and convince is also a potential danger. Gaming can be an effective way of building consensus on key ideas or factors in the minds of participants. They attempt to create the illusion of reality, and good games succeed. This illusion is a powerful and at

a poorly designed game might provide an unrealistic quantity and quality of information to the players

times insidious influence, especially on those with limited operational experience. A poorly designed game, for example, might provide an unrealistic quantity and quality of information to the players. It could thus give a false picture of the value of a weapons system that relies on just such unattainable information to be effective.

Wargaming, as other approaches to study and analysis, may intentionally or unintentionally advocate particular ideas or programs which falsely color the events or

decisions made in a game. Such problems may lead to self-fulfilling prophecies. Designers of wargames have great power to inform—or manipulate. Players and others involved in games must be aware of this danger. They deserve and should demand an explanation of why events run counter to experience or expectation. They must be allowed, in fact encouraged, to be skeptical and question the validity of any insight derived

from a game until the source of the insight is adequately explained. If the reasons which underlie an insight appear artificial, the insight may be false and the system may need correction. On the other hand, surprising results can often lead to an important conceptual breakthrough. The key to distinguishing between them is in understanding how much of a game's outcome is driven by artificial models of reality and how much is driven by the decisions of the players.

Finally it is important to understand what a wargame is not. A wargame is not analysis—at least not in any usual sense. It does not produce rigorous, quantitative, or logical dissection of a problem or define precise measures of effectiveness to compare alternative options. Nor is it real. Despite the similarities of gaming language and experience to aspects of actual military operations, its abstractions are many and often not obvious to those without real-life combat experience. And wargames cannot be duplicated, they cannot be replayed by simply changing the random numbers (or rolls of the die). The chance of independent games producing the same sequence of events and outcomes is so small as to be negligible. Wargaming is an exercise in human interaction—and the interplay of human decisions and simulated outcomes of those decisions makes it impossible for two games to be the same. As a result of all these factors, wargaming is not a panacea for learning

about or solving problems of warfare. Its forte is the exploration of the role and potential effects of human decisions; other tools are better suited to investigating the more technical aspects of reality.

Where is Wargaming?

Wargaming today is in a state of flux. Classical techniques of the seminar and path games remain popular. At the other extreme are technologies associated with virtual reality. Proponents of these newer technologies proclaim revolutionary breakthroughs in how we will portray, study, and evaluate military activities, breakthroughs that lie just around the proverbial corner.

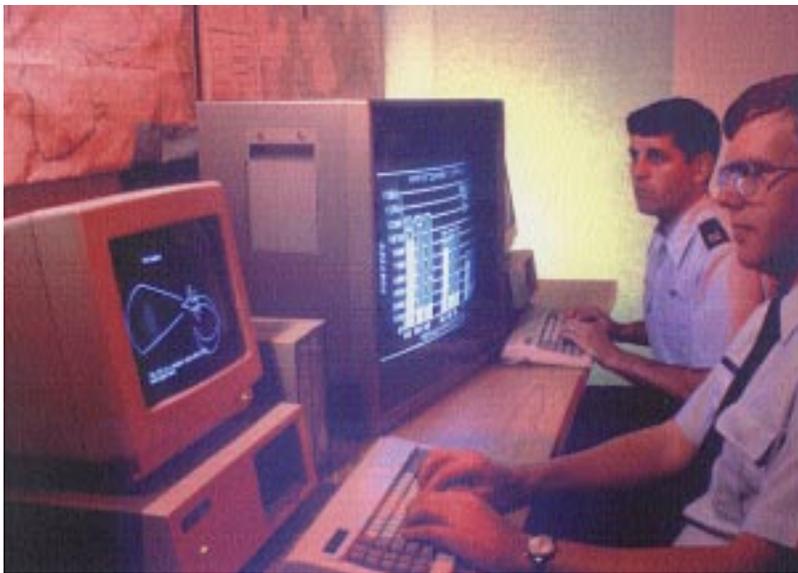
Seminar games, in which the players meet in one or more groups to discuss their decisions and evaluate alternatives, continue to be probably the most frequently employed type of wargame. Because they rely to a great extent on the expertise of participants and not on rigidly constructed mathematical models, seminars are frequently the technique of choice for political-military

Navy continues to use seminar games to explore programmatic issues in a newly revived series of Program Objective Memorandum (POM) wargames.

One of the more innovative developments is taking place at the Air University. While the Air Force Wargaming Center at Maxwell Air Force Base continues to run seminar and computer-assisted games, wargaming is also being used at the intermediate (or staff college) level to supplement more traditional readings and course work. Students receive a personal computer and software package, including computerized planning aids and game systems with which to explore lessons learned in operational settings. Last year the Air Command and Staff College convened a unique conference which brought together leading designers and experts in commercial hobby wargaming to discuss techniques that might improve military gaming for educational purposes.

Advanced techniques of distributed simulation coupled with the graphical magic of virtual reality systems promise wondrous capabilities. General Paul Gorman and some other proponents of these systems presented a dramatic demonstration of their power and promise to Congress a few years ago. That demonstration showed that distributed simulation can link separate tactical-level simulators from locations scattered across the country into a single overall combat situation. These capabilities enable a theater CINC to watch the operation of an individual ship, aircraft, or vehicle. It is a technological marvel, but to what end? In the real world a CINC seldom if ever can afford to focus on the operation of individual tactical elements of a joint force.

The danger of overemphasizing "gee whiz" technological capabilities of modern computers is obvious; yet when applied properly the techniques of virtual reality and distributed simulation are extraordinarily valuable. They can help enormously in training combat units at the tactical level. Computerized training can supplement a more limited use of field exercises to improve the overall quality of unit training with significant savings. But it is important to remember that no amount of simulation



U.S. Air Force

Air Force Wargaming Center.

games. Such games have proven invaluable in exploring issues arising from the political dissolution of the former communist countries of Europe. For example, in mid-1993 the Marine Corps Wargaming Center at Quantico hosted an especially interesting game that explored various options for resolving the Bosnian crisis. In addition, the



Courtesy U.S. Naval War College Museum

Wargaming at the Naval War College, circa 1947.

no amount of simulation can substitute for experience with actual systems in actual (not virtual) environments

can substitute for experience with actual systems in actual (not virtual) environments.

On another level virtual reality techniques let analysts and operators recreate and visualize combat operations in more accurate and useful ways which is a valuable analytical and educational tool. The truly spectacular use of SIMNET to recreate the Battle of 73 Easting in Operation Desert Storm demonstrates the enormous power of

this technology. It helps us not only to explain what happened during an actual operation or exercise but, more importantly, to determine why things happened as they did. In a fuller way than was ever possible before, we can begin

to understand what decisions forces made, on the basis of what information, and why and how that information conformed to or differed from “ground truth.”

But there should not be any illusions about the application of virtual reality simulation. The more we attempt to reproduce the details of actual environments and operations, the more and more detailed data we must collect and model. Detailed simulations

can help develop and teach small unit tactics and doctrine. They can help disparate elements of a joint force learn more about the environment in which other elements operate, and demonstrate the capabilities and vulnerabilities of the different services and combat arms. But virtual reality simulations cannot fully substitute for well-designed and structured wargames and exercises of joint command and control. And it is on this crucial interface of joint operations that we must focus even greater attention in the future.

Command and control is also the interface where wargaming—with its emphasis on human decisionmaking under the pressure of time and based

on imperfect or incomplete information—is most effective. We can find a classic example of how wargaming contributes to an understanding of joint command in the Warrior Preparation Center at Einsiedlerhof, Germany. U.S. European Command (EUCOM) and others use the facilities and techniques of the center to explore issues of joint command and educate joint staffs on these issues. In Trailblazer '93, for example, the center conducted a wargame to help EUCOM officers learn to implement the command and control and the planning functions of a JFACC staff in settling a confrontation between continental powers that required U.S. military intervention. During this game the players learned the crucial importance of balancing offensive and defensive air power when the opposition team launched several successful air attacks on friendly bases. They also learned the potential power of an integrated joint force as the JFACC staff managed the flow of information and controlled and applied the combat assets of the entire joint force efficiently and effectively.

gaming is particularly useful in educating commanders and staffs about service capabilities and components

The gaming at the Warrior Preparation Center provides commanders and staffs with unique opportunities for realistic training through realistic command problems based on a realistic combat scenario. Even in this center, however, the players must adapt to a system and specialized devices. Not all the systems and techniques that would be used in a real confrontation when operating from

actual command centers are employed. The next step in moving from situational to environmental realism is found in the Navy's use of a concept known as Battle-Force In-Port Training (BFIT).

In a BFIT exercise naval staffs respond to wargaming scenarios and developing situations using the same systems and procedures employed in actual operations. Typically, participants man their normal duty stations ashore and aboard ship and receive the gaming inputs through the actual sensors and communication systems. Such an approach to gaming requires careful and specialized preparation of data to insert into real systems as opposed to simplified gaming systems.

When successful BFIT is the most effective form of wargaming because it allows players to accomplish real-life functions in a realistically simulated artificial environment. Emphasis is put on commanders and their decisions, not on fancy virtual reality systems and exotic computer graphics. Technology is the servant of the players, helping them experience a realistic environment at a level of detail expected during an actual operation. This is the key to a truly great wargaming system.

Whither Wargaming?

As we come to grasp the realities of a post-Cold War world, the Armed Forces must adapt. And, as defense budgets decline, the possibility that we may have to use force seems to increase, and the situations in which we are likely to use force are not those for which we are best prepared. Instead of massive battles on the plains of central Europe, we must prepare for dirty little wars in Bosnia, Somalia, or other remote locales that we are unable to identify today. The services cannot remain introspective as in the past.

Jointness is not a fad—it is a fact of life that is here to stay.

History has shown that when the services work together for prolonged periods (as they did in the Solomons during World War II) they appreciate each others' strengths and weaknesses and integrate their capabilities to maximize the former and minimize the latter. In the future, we are unlikely to have the luxury of time to learn once a conflict has begun. The best time to learn these lessons is peacetime, and the best way to learn is in carefully integrating operational analyses, field exercises, and wargames. Gaming is particularly useful in educating commanders and staffs about service capabilities and components, and the command and control necessary to integrate them into a cohesive joint force.

In the 1930s the Naval War College slid slowly but surely into a quagmire of self-fulfilling prophecy. Seduced by the apparent power of models and enamored of the mechanics in apparently realistic representations of combat, the wargamers at Newport made the fatal error of emphasizing the system and deemphasizing the players. Naval doctrine that emerged from and reinforced those flawed wargames severely handicapped American cruiser and destroyer skippers when they confronted a clever and determined opponent who did not play by Newport's rules. The Navy atoned for its sins in the blood of sailors and the treasure of ships in the nightmarish battles off Guadalcanal.

Once again we face subtle traps; only today the systems are more powerful, the temptations more alluring. To avoid a future butcher's bill we must learn from the past. If we use wargaming, as we must, to develop joint doctrine and educate joint warfighters, we have to ensure that games focus on players and their decisions. We cannot afford to be distracted by exotic bells and whistles or dazzled by high-tech computer graphics. We have new and powerful tools just as we had in the 1930s. We must harness these tools, not permit them to dictate our purposes. **JFQ**