Archived Content

Information identified as archived on the Web is for reference, research or record-keeping purposes. It has not been altered or updated after the date of archiving. Web pages that are archived on the Web are not subject to the Government of Canada Web Standards.

As per the [Communications Policy of the Government of Canada](#), you can request alternate formats on the "[Contact Us](#)" page.

Information archivée dans le Web

Information archivée dans le Web à des fins de consultation, de recherche ou de tenue de documents. Cette dernière n'a aucunement été modifiée ni mise à jour depuis sa date de mise en archive. Les pages archivées dans le Web ne sont pas assujetties aux normes qui s'appliquent aux sites Web du gouvernement du Canada.

Conformément à la [Politique de communication du gouvernement du Canada](#), vous pouvez demander de recevoir cette information dans tout autre format de rechange à la page « [Contactez-nous](#) ».

CANADIAN FORCES COLLEGE / COLLÈGE DES FORCES CANADIENNES

AMSC 3 / CAEM 3

JOINT AND COMBINED CAMPAIGN PLANNING

UNDERSTANDING THE ENEMY: TIME TO TUNE UP THE PLANNING

PROCESS

By /par Colonel Stuart A. Beare

ABSTRACT

The nature of conflict continues to evolve and, as a consequence, is introducing factors at the operational level of war that were not formerly of concern to the operational commander. While doctrine acknowledges these new factors and encourages commanders to incorporate them in planning and decision-making, it falls short on how this can be done. Moreover, current organizational constructs do not provide the means to deal with the complexity these new factors introduce. Contemporary doctrine for planning and decision-making is based on cold war assumptions about how an enemy can be characterized and how his/her actions can be predicted. The planning process seeks to deal with contemporary complexities by disregarding issues of will and the complex relationships that affect them, and by focusing on physical factors alone. The operations planning process (OPP) and intelligence preparation of the battlespace (IPB) need to be renewed. These processes must consider the force of will on an enemy and analyze how this will is generated as a product of the relationship between an enemy's government, population and its military. Planners must refocus their efforts to address the broadest range of potential scenarios a conflict could generate, in lieu of developing detailed, highly synchronized plans. Supported by analysis of the outcomes of recent conflicts, and by a critical look at current practises from the perspective of selected military theorists, this essay will demonstrate that current doctrine and organizational thinking do not allow commanders to develop effective understanding of an enemy. The essay will argue, and conclude, that operational commanders require new methods and new means to understand the enemy and to exploit this understanding in the decision-making process.

UNDERSTANDING THE ENEMY: TIME TO TUNE UP THE PLANNING PROCESS

Know the enemy, know yourself; your victory will never be endangered.[1]

Sun Tzu

Many intelligence reports in war are contradictory; even more are false, and most are uncertain.[2]

Clausewitz

The Problem

The dilemma described in this divergence of views between Sun Tzu and Clausewitz has plagued operational commanders throughout time. Sun Tzu encourages military commanders to develop their understanding of the enemy, as this understanding is a pre-condition to success. Clausewitz, on the other hand, had absolutely no faith in intelligence and instructs that military decisions are not to be based upon it. Today, commanders follow Sun Tzu's advice by seeking to establish dominant battlefield knowledge. They expend tremendous amounts of resources in people, time, money, and effort to this end. At the same time, commanders heed Clausewitz's counsel by seeking ways to mitigate the effects of inadequate, contradictory and incorrect intelligence. In both cases, the intention is to reduce the effects of uncertainty on operations, thus reducing the chance of defeat and failure.

Western militaries have invested heavily in technology and organizations in the pursuit of superior situational awareness. There are many recent examples of how this investment alone has been inadequate, and how intelligence failures have adversely affected military operations as a result. The Gulf War in 1991 demonstrated the most stunning employment of high tech systems ever arrayed against an enemy. In the end, however, US commanders read the situation wrong, overestimated the willingness of the Iraqi Army to fight, and were surprised by the early withdrawal of their operational objective, the Republican Guard.[3] During Operation Restore Hope in Somalia in 1993, operational

forces failed to grasp the system of problems causing that country's crisis. That operation ended in strategic defeat and early withdrawal of US forces from the mission.[4] In Croatia in July 1995, UN forces were shocked at the speed at which the Croatian Army was able to drive nearly a half a million Serbs, and their formerly victorious military, from the Serb held Krajina.[5] And more recently, the West's failure to understand the enemy and plan accordingly came to the fore during NATO's actions in Kosovo. During the 1999 Kosovo campaign, a three-day air campaign became a 78-day contest of wills and NATO's attempts to prevent further ethnic cleansing in the region resulted in the unanticipated displacement of 1.8 million ethnic Albanians.

Over the course of the last two decades, western doctrine, led by the US, has taken steps to acknowledge the growing complexity of the operational environment. Operational planning, formerly based on weather, enemy and terrain, now includes civil and political factors.[6] Intelligence preparation of the battlespace (IPB) acknowledges the impact of the civil-military dynamic at the operational level and seeks to incorporate this in the decision-making process. Yet, the last decade demonstrates that these efforts have not been enough, and operational forces continue to fall victim to strategic and operational surprise. Doctrinal shortcomings, organizational inertia, military-centric thinking, and limitations in training and education are the likely culprits in this case. Effective operational planning requires an accurate understanding of the enemy and well-executed IPB. The ability to effectively understand the adversary and to incorporate this understanding in operational decision-making continues to allude western militaries. Failure to address this shortcoming will result, in the least, in future operational frustration, or worse, strategic defeat.

This essay argues that operational commanders require *new ways and means to understand the enemy and to exploit this understanding in the decision-making process*. First it will look at redefining the characteristics of the contemporary threat and critically assess the processes used to analyse it. The essay will demonstrate that effective understanding is contingent upon the grasp of both the enemy's physical component *and* his/her will, and that will is a product of the relationship

between the government, the people and their military. When analyzed from the enemy's perspective, consideration of both military and non-military factors generates a more accurate assessment of the enemy's abilities and intentions. Second, the essay will take a critical look at how the planning process incorporates understanding of the enemy into decision-making. It will find that the planning process fails to incorporate the full range of factors that affect enemy actions, that there is an unavoidable tension between the need to support the commander in decision-making and the need to support the staff in detailed planning, and that command and control and decision support tools fail to represent the non-military elements that characterize today's battlespace. Finally, the essay will conclude by arguing the case for new skills, structures and tools to support commanders in managing the complexity of contemporary operations, and highlight those areas of the planning process that would benefit the most from change.

The Doctrine

The operations planning process (OPP) is a decision-making process that results in a plan to achieve assigned strategic objectives. OPP follows a six-step approach that includes initiation, orientation, course of action (COA) development, COA decision, and plan development and review.[7] Enemy and environmental factors are predominant in the orientation, COA development, and decision steps.

OPP is supported by a rigorous process that defines the enemy and the environment. Intelligence preparation of the battlespace (IPB) is a systematic, continuous process of analyzing the enemy and the environment in a specific geographic area.[8] It supports the commander in decision-making by determining the enemy's most likely COA and by describing the environment that the operational forces are working within. IPB follows four steps: step 1 defines the operational environment in order to identify those characteristics that influence friendly and enemy operations; step 2 identifies battlefield effects, including those that are terrain, weather or demographically

driven, and how they influence friendly and enemy forces; step 3 evaluates the enemy to determine how he would operate when unconstrained by the effects of the environment; and step 4 determines possible enemy COA by using the results of the previous steps.[9]

The planning process drives IPB, in particular, through the creation of the Commander's critical information requirements that are developed during the orientation stage. IPB, however, drives the decision phase. Environmental information and enemy COA situate the wargaming process that supports the decision. As well, IPB products result in planning and decision support tools that affect operational execution. If a commander does not seek the right information (as represented by his/her critical information requirements), IPB can result in erroneous conclusions on enemy capabilities and intentions. If assessments of enemy COA and environmental analysis are deficient, decisions on the best friendly COA are suspect. And finally, if COA based wargaming products are of questionable quality, the resulting operational plans can be rendered irrelevant.

Understanding the Threat

IPB was developed in the era of AirLand Battle doctrine and the major theatre of war construct of the Cold War. IPB is based on several assumptions from that era. The first is that the most critical threat factors are weather, enemy and terrain. Others assume that the enemy is identifiable and will conduct contemporary combat operations, that there exists substantial "threat" data vis-à-vis organizations and doctrine, and that the enemy's actions and environmental effects are predictable.[10] These assumptions are consistent with Canadian doctrine. In recent years, however, US doctrine has evolved to include civil considerations (economic, political, cultural, media etc). US manuals are now using the term METT-TC (Mission, enemy, troops, terrain and weather, time, and civilian considerations) to represent a more holistic view of planning factors.[11] IPB, however, falls short on how to incorporate civil factors into the process and remains focussed on military

considerations alone.[12] While the assumptions on which IPB is based may have been relevant in the Cold War, contemporary experience demonstrates that these assumptions no longer hold true.

IPB assumptions do not represent current or future realities. A simple calculus of weather, combat forces and terrain cannot fully characterize the threat environment. Enemy actions will not be shaped solely by what he/she is <u>capable</u> of doing, but also by what he/she is <u>willing</u> to do. The multitude of contemporary conflict types, beyond those of conventional war, provide a wide array of potential enemy types, and even scenarios where an enemy may not be identifiable at all.[13] Further, contemporary conflict has more and more political dimensions, and has become multi-national, multi-organizational, multi-dimensional and multi-cultural as well.[14] In these conditions, a force may be unable to define an enemy, recognize or be able to select their sources of strength or weakness, concentrate on any particular party to a conflict, or identify a government with which to work.[15] Finally, even when an enemy can be defined, his/her actions are rarely predictable.[16] Given these truisms, what then are the underpinnings to achieving a realistic and accurate read on the threat?

The Government, The People, and The Army: The Remarkable Trinity

Understanding of the enemy must originate not only from knowledge of who and what he/she is, but why he/she chooses to fight as well. IPB focuses uniquely on enemy capabilities (based on the physical component), as the issue of will and intent (the moral component) is deemed too complex to assess. Mao Tse Tung recognized the need to deal with the moral equation and expressed his thoughts this way: "A commander must understand the forces that shape the actions of both his unit and those of the enemy".[17] Avoiding consideration of the moral factor can lead to potentially disastrous consequences. When considered in the absence of moral factors, assessments on enemy strengths and vulnerabilities or deductions on potential enemy actions may be totally erroneous, thus undermining the value of the decisions that are based upon them.

Menning, in *Bayonets Before Bullets*, proclaimed that "Commanders and their staff officers must learn to grasp the essence of situations, react, then shape them to …advantage."[18] This essence, argued by Smith in his treatise on the Clauzewitzian Trinity, is represented by the relationship between the government, the people and their army in war.[19] Clausewitz characterizes this trinity as being animated by reason (embodied in government), passion (generated by the people) and chance (the complexity of armies in war).[20] While the qualities of reason, passion and chance may prevail respectively in the government, the people and the army, each element of the trinity is affected to some degree by all of these qualities. Smith points out as well that reason, passion and chance affect the trinity in different ways and that they cannot be treated separately. Their relationship can be illustrated by this simple example: "A change in policy affects the conduct of military operations. A change in the people's perception … changes the conduct of military operations. … a change in military operations can and usually does affect government policy and the people's perception of the war."[21] It is the action of reason, passion and chance and the relationship between governments, their people and their armies that drive battlefield events.[22] Therefore, to understand the enemy, one must understand his/her government, his/her population, and the dynamics of their interrelationship. It must be remembered that it is societies that wage war, and it is these factors that generate and determine the enemy's will to fight. It is on this factor of <u>will</u>, therefore, that operational commanders must necessarily focus their planning effort.

Will

Doctrine instructs that attacking an enemy's will is the purview of the strategic level. Operational forces are directed to focus on the physical component of war and are conditioned to identify tangible forces as operational centers of gravity.[23] Clausewitz teaches that an enemy's power of resistance is a product of his total means and his strength of will.[24] If his/her power of resistance is represented in physical <u>and</u> moral qualities, then both of these qualities must be of interest to operational commanders.

The OPP focuses on tangible enemy courses of action and on physical centers of gravity. Regarding the enemy solely from a physical perspective constrains views on the range of options an adversary may exercise, and colours assessments on the lengths that an enemy may be prepared to go to achieve his/her objectives. This purely capability-based view can lead to erroneous conclusions that become the foundation to decision-making. In order to be free of these limitations, COA development must regard will as a key factor. Equally important, the planning process must identify two centers of gravity, one physical and one moral, in support of the campaign planning effort. "Military success demands the total assessment of the enemy's power of resistance."[25] As supported by Mao, a comprehensive view on enemy capabilities, his motives, and his motivation, is more likely to lead to an accurate assessment of an enemy's true intent, and provide clues as to how he/she may be defeated.

Perception and Ethnocentrism

Understanding the enemy's capabilities and intentions alone is insufficient; one must understand how these may be perceived (or misperceived) as well.[26] As Booth illustrates in *Strategy and Ethnocentrism*, in 1973 Egyptian forces were able to defeat the previously victorious Israeli Defence Force (IDF) through careful planning, as well as a conscious attempt to know their enemy. The Israelis, on the other hand, while knowledgeable of Egypt's capabilities and desires to regain the Sinai, considered Egyptian options from their own perspective, that is through a pair of Israeli lenses.[27] In effect, the Israelis badly underestimated the lengths the Egyptians would go, and the means they would exploit, to achieve their objectives. Instead, they based their assessments on previous easy victories. In the end, Israeli ethnocentrism (otherwise known as ethnic arrogance) led to their operational defeat. In the aftermath of the 1973 war, the IDF were able to attribute their defeat to their own cultural prejudices and subsequently created a special group of devil's advocates to challenge norms and existing views in the planning of operations.[28] This approach is innovative to learning more of an enemy while checking the forces of one's own ethnocentrism.

History is full of examples where lack of knowledge has led adversaries to analyze the enemy from their own perspective. As confessed by a US officer experienced in operations abroad: "ethnocentrism and cultural arrogance often accompany US troops into foreign countries."[29] In these cases, ethnocentrism puts forces at a serious disadvantage as they impose their own prejudices, fears, hopes and styles on the enemy – interfering with efforts to know the enemy and to predict his/her behavior better.[30] Therefore, when seeking to understand the enemy and to determine his/her potential actions, it is necessary to consider both the physical means as well as the force of will, and to undertake this consideration from the <u>enemy's perspective</u>. Perfect knowledge of an enemy's will and intent can still lead to false conclusions if adversaries apply their own reasoning and cultural value set to the analysis problem.

In war, both the enemy's physical and moral dimensions must be studied closely. As pointed out earlier, these dimensions cannot be determined through an assessment of military forces alone. Governments, the people, and their militaries participate in a complex relationship that is influenced by reason, passion and chance. In understanding this trinity, commanders come closer to making informed judgements on an enemy's national will and capacity, his/her capability and motivation, and his/her intent. When considering how an enemy's intent can be realized, militaries remain vulnerable to embedded ethnocentrism and risk considering enemy options based on their own set of values. Doctrine acknowledges non-military factors in the planning process, but falls short in recognizing their relationships at the operational level and on how to incorporate them in analysis. While doctrine concludes that an enemy's actions are best determined by an understanding of his/her intent, COA are developed purely from a capabilities-based approach. Doctrine is suggestive of the dangers of ethnocentrism but offers little on the ways and means to mitigate its effects. Ways and means to correct these shortcomings will be discussed further on in this essay.

Going back to the planning process, the intent of understanding one's enemy is to enable commanders and staff to develop those potential COA the enemy may select to achieve his/her

objectives. This information, standing on its own, is of no real utility. Its usefulness is in the effort to compare friendly with enemy COA, with a view to determining the advantages and disadvantages of various courses available to the friendly force. The enemy's COA, therefore, shape the next step of the process: COA comparison. Before proceeding to an evaluation of the COA comparison methodology, one must remain mindful of the probabilities and possibilities of COA prediction that have been raised thus far.

Dealing with Uncertainty

The Wargame

Following enemy COA production, the planning process moves to friendly versus enemy COA comparison, or COA analysis in the US lexicon. This step consists of a series of wargames of all potential enemy versus friendly COA aimed at providing a comparison of outcomes and identifying, in the minds of the commander and staff, the most likely and most dangerous enemy COA. The commander uses wargame results to decide on a plan and the staff uses their outcomes to produce decision aids and synchronization products that support plan execution.[31] At the end of this planning phase, staff and commanders should have a shared vision of the operation, a common view on all potential events, and should have identified branches and sequels for further planning.

Sun Tzu spoke to the issue of planning in this way: "In respect of military method, we have firstly, Measurement; secondly, Estimation of Quantity; thirdly, Calculation; fourthly, Balancing of Chances; fifthly, Victory."[32] It is interesting to note that most modern armies adhere in some way to this notion of planning process. Today, many militaries seek to balance chance by conducting wargames, a methodology with a long and mixed history.

The first modern wargame, known as <u>Kriegsspiel</u>, was developed in 1824. Kriegsspiel was a Prussian method of playing battles on maps, supported by a series of rules. In the late 19th century,

11/32

the Prussian Army moved to a new concept called <u>Frei Kriegsspiel</u>, a method less encumbered by rules and calculations. By World War I, the German Army was using wargames extensively in education, planning, and analysis.[33] Germany's use of the wargame was extremely effective in particular in the development of the Blitzkrieg concept and its use in operations into France and Russia during World War II.[34] Germany's successful use of wargaming at the operational level, however, could not make up for those shortfalls in strategy that led to that nation's eventual defeat.

Others, watching the impressive results of Prussian and German use of wargames, copied their works almost verbatim. However, most were unsuccessful in their use. While using virtually the same wargaming procedures, other users were prone to misinterpret or misrepresent results and would often derive false conclusions. One author has attributed this outcome to the phenomena of unintended consequences; these consequences being unintended diversion, suppression and learning.[35] The French, preoccupied with the invulnerability of their Maginot Line, and absorbed in detailed studies of weapons ranges, defensive works, and defensive calculations, suffered from <u>unintended diversion</u>. The Russians, under Stalin, conducted wargames solely to substantiate their leader's appreciation of the situation, <u>suppressing</u> opposing outcomes as a result. The British Air Power theorists of World War II were victims of <u>unintended learning</u> as the numbers produced by modeling gave rise to a theory that was used, in turn, to generate credibility in their numbers.[36] The lesson is that the mechanics of developing wargames are simple in comparison to the understanding of their proper use. These experiences do not bring into question the value of wargames themselves, instead they illustrate the importance of using them effectively. While history has frequently cited intelligence failures as the reason forces become surprised by an enemy's action, can it not be that commander and staff thinking, their processes, and their prejudices are the culprits in most of these cases?[37]

Capability and Intent

As discussed earlier, enemy COA can be developed either based on a view of the enemy's capabilities or his intent. Capabilities are strategies that the enemy <u>might</u> take, while intentions are strategies that have already been <u>selected</u> for execution.[38] Given the difficulty of determining intent, OPP defers to a capability-based approach to enemy COA development, that is the assessment of all possible enemy actions within his capabilities, regardless of his intent. In this approach, friendly COA are compared with those of the enemy with a view to identifying the friendly course that represents the least risk, regardless of the course selected by the enemy. This approach, in game theory terms, is the maxi-min model, an approach that seeks to mitigate risk by selecting the least-worst option. As determined by game theorists as far back as 1951, the maxi-min model is a "less than optimum solution for selecting COA".[39] By acting before the enemy has indicated an intent, one way or the other, friendly forces advertise to the enemy their intent and offer him/her the advantage of the second move, a move based on indicators vice guess-work. Should not friendly forces seek to force the enemy to indicate a COA first, before the friendly force commits to an action, thus seeking to gain the advantage of the second move?

A commander can seek to analyze the situation entirely from the enemy's perspective, develop an understanding of his/her intent, and then visualize how this may be transformed into action. Thereafter the commander can develop the optimum COA to counter this more realistic range of potential enemy actions. By looking for indicators of enemy intentions, thereafter making a decision to commit to a particular COA, a commander can select the COA that provides the best payoff. This approach, based on the game theory mini-max model, balances optimism with conservatism by choosing the worst of the best cases. The advantage of this approach is that the friendly commander, having decided second, confirms his/her understanding of the enemy intent, and gains a good read on the enemy's COA. As a result, the commander has more confidence in his decision to commit to a particular course and denies the enemy the opportunity to interpret his intent

based on a first move.[40] While this is admittedly easy to say, it is difficult to do in a rapidly changing situation. The object of the planning process, however, should be to seek opportunities to force the enemy to show his/her hand first, while the friendly force positions itself to exercise the <u>optimum</u> plan of action, vice that COA which is the least-worst of those available to the commander.

The Limits of OPP

What then, can be done in circumstances where time or complexities interfere with efforts to determine, with confidence, a read on enemy intent? The object then must be to think through and plan for all foreseeable possibilities. The current planning process proclaims this as its goal, however, practical experience demonstrates that this is rarely achieved. First, planners tend to identify the most likely enemy COA fairly early in the planning process, normally before intelligence has had the opportunity to develop the situation.[41] Second, OPP methods tend to drive staff to focus on planning products (outputs such as decision support templates, etc) instead of giving due consideration to the whole range of enemy options and potential wargame outcomes. These factors lead planners to follow a single-track approach, driven by what has been described as the "Most Likely Enemy COA Trap".[42] The product, in this case, is a highly synchronized operations plan that deals with one enemy COA. If the enemy complies with planners' expectations, so much the better, however if the enemy does not, then the plan produced can become quickly irrelevant. The planning process must instead develop the broadest possible range of enemy COA and fully consider these in wargaming. The product here should be a comprehensive grasp of branch and contingency plans that deal with the broadest possible range of eventualities.

Those staff officers who avoid the most likely COA trap find themselves conducting multiple wargames. For instance, in a scenario where one is considering three COA for each of the friendly and enemy forces, the staff is compelled to conduct nine wargames. In each wargame, players progress through a series of action – reaction – counter-reaction events. Actions are recorded in a

synchronization matrix that indicates where potential branches and sequels may arise. While the synchronization matrix is an excellent tool to record options for friendly actions, it deals with only one enemy COA at a time. Given the existing complexity of the wargaming process, variations to the enemy COA are difficult to represent and are extremely problematic to record. This limitation adversely affects the quality of the wargame's results, because like friendly forces, the enemy will have branches and sequels to his/her plans. If wargaming results are to remain useful to the decision-making process, they must assume that the enemy is indeed capable of midcourse corrections and must record potential enemy branches and sequels in a form that supports plan development and operational decision-making. One author has offered the notion of adapting decision trees to fulfil this flexible record keeping function, a notion worthy for further consideration as an alternative to the current wargame record keeping process.[43]

Clausewitz described the complexities of war this way: "… the conduct of war branches out in almost all directions and has no definite limits; while any system, any model, has the finite nature of a synthesis. An irreconcilable conflict exists between this type of theory and actual practice."[44] Thus, the wargaming effort should be aimed at producing a robust plan of action that responds to the broadest possible range of events instead of producing one detailed plan that may not withstand first contact. To reorient the wargaming process to this focus requires the separation of that wargaming which supports decision-making, from that which supports detailed synchronization and plan development. In essence, that which is commander-centric (the decision) must be separated from that which is staff-centric (the detailed plan).

The wargaming process is frustrated by the separate roles of the commander and the staff. Doctrine is fairly prescriptive on the role of the principal staff but is shy on the details of command participation.[45] Liddell Hart proclaimed "… the issue of battles is usually decided in the minds of the opposing commanders", therefore, commanders do indeed need to be involved.[46] As reported by the US Centre for Army Lessons Learned, this factor results in a commander and staff disconnect which

leaves commanders to spend time fixing problems attributed to poor procedures and planning.[47]

Further, wargames are conducted by a large group of staff officers. This approach promotes 'group think' and is not well suited for dealing with complexity. The Bundeswehr uses the wargame to deal with complex problems and decision-making first. As such, initial wargames are conducted by a small and select group. On making a decision, however, the wargame results are passed to the staff in order that they may review the plan's feasibility and develop it in detail.[48] The Canadian and US approaches, that is to conduct large staff intensive wargames, is less than optimal for dealing with complex problems and brings issues of detail into decision-making too early into the process.

Wargaming does turn out well-synchronized plans of action. It does this, however, at the expense of considering all potential enemy courses of action, by ignoring the enemy's intent, by focusing on physical attributes alone, by limiting the exploration of branches and sequels, and by failing to involve the commander in a meaningful way. The wargaming process needs to develop the means to include the enemy's intent as a factor, must support a calculus to quantify moral as well as physical attributes (at least in relative terms), must produce the broadest range of potential branch plans, and must necessarily be commander driven. The outcome of the process should be focussed on the decision on a preferred way ahead (including branch and sequel identification), rather than the production of detailed decision support and staff products. In the end, this improved process would then ensure that the commander is better prepared for the uncertainty of battle and that the staff have a broader range of options, in terms of branches and sequels, against which they can prepare operations and contingency plans.

The Players and the Tools

Wargaming quality is not limited by process alone. The attributes of the participants and the tools they use are determining factors as well. The best wargames are conducted on the basis of an adversarial game, that is one where friendly and enemy forces are represented and role-played.[49]

Doctrine prescribes that those playing the role of the enemy, normally the J2, learn to think "red" by becoming versed in enemy doctrine, organizations, and equipment.[50] As described earlier, this view is too narrow. To think red, one must consider the adversary's government and population and their relationship to their military. This information must then be fused to determine the influence of will. An understanding of will, combined with military capability, significantly improves the chances of arriving at accurate conclusions on what the enemy intends to do.

The commander, the ideal individual to represent his own forces in wargames, must be experienced in his own right. Three experts in learning systems, MacMillan, Entin and Serfaty, studied the performance of planning experts versus that of the average staff officer. They concluded that the experts "generated more detailed COA, focussed immediately on critical unknowns, understood the complexity of the situation better, understood the sequencing of events better, had more concern about outcome risks, identified more potential problems, anticipated changes in the situation, and planned contingency operations".[51] Those who were less experienced often had trouble conveying what information they needed and in identifying what decisions needed to be made.[52] While these observations appear to be self-evident, they point to the critical importance of command and staff _experience_ and to the need to develop this experience in the broadest possible range of operational scenarios.

The limited numbers of tools that support operational level wargaming do so based on traditional large-scale force on force models.[53] The tool capable of incorporating moral factors in a meaningful way has yet, understandably, to be developed. There is no one authority on the real theory of wargames. There does exist, however, a general consensus on their value, and their qualities are universally described in terms of realism, flexibility, and efficiency.[54] With this distinction in mind, tools are likely to adhere to a force on force approach and leave the moral issues to player judgement. The issue, in any case, is not really the tool, but how it is used. An acceptable

tool in the hands of experienced commanders and staffs has proven to be, and will continue to be extremely useful.

Experience, on the other hand, is difficult to quantify and is relative to the situations from which it originates. Properly employed wargames can fill the experience gap. In some armies, wargames are very much a part of the professional culture. In these environments, the wargame develops and flourishes and the professional military learns, develops and gains valuable experience as a result. [55] In the end, wargaming must be developed to address military issues in both the physical and moral sense. The development of operational wargames requires inputs from those with expertise in history, culture, economics, politics, and the social sciences.[56] Regardless of the wargaming tool used, commanders and staffs must keep their limitations in mind. The tools are intended to support decision-making, not to predict an outcome.[57] Just as important, users must remain vigilant to the risk of applying the wrong model to the problem, or worse, to changing the problem to fit the model.

OPP and IPB are complex activities involving large staffs and detailed processes. The notions posed thus far in our quest to know the enemy and to apply this knowledge to planning, are admittedly complex as well. While it is not the object of this essay to solve these issues, a brief analysis of where some of these complexities lie may lead us to conclusions on how they may become more manageable.

Managing Complexity

Systems Theory and the Planning Process

Clausewitz describes theory as "… a guide to anyone who wants to learn about war from books; it will light his way, ease his progress, train his judgement and help him to avoid pitfalls. … it is not meant to educate the mind of the future commander … not to accompany him to the battlefield."[58] With this caution in mind, the planning process can benefit from a consideration of systems theory and Peter Senge's writings on systems thinking and learning organizations. Senge

presents two systems concepts relevant to the challenges of contemporary operations. These concepts are characterized as "mental models" and "dynamic complexity".[59]

Mental models are intellectual processes that determine how persons or organizations deconstruct problems to arrive at a perception of reality. They are "deeply ingrained assumptions, generalizations, or even pictures or images" that effect how things are seen and how decisions to act are taken.[60] In order for mental models to be effective, they must be constantly shaped, tested, and improved. Where mental models are tacit (unofficial but embedded) vice doctrinal (an organization's endorsed process), they are particularly insidious as they remain unchallenged and unchangeable.[61] OPP and IPB are mental models. They consist of a series of assumptions and prescribe a thinking process that seeks linear cause and effect relationships. Pursuit of detail and analysis aimed at reducing aspects of the environment, enemy and other factors to simple deductions are part of a mental model. Terrain analysis, templating of enemy doctrine, and wargaming COA are parts of a mental model. As suggested by Snider in *An Assessment of IPB*, this strict adherence to a mental model can limit thinking and action in an operational environment.[62] While OPP and IPB, as mental models, benefit from a predictable organizational approach, they remain products of AirLand Battle operational thinking. If the planning process is to be relevant to contemporary and future operational needs, its assumptions on the understanding of the enemy and the predictability of his/her actions need to be tested and reshaped, and a new model developed as a result.

Senge presents an alternative concept in systems thinking that he has dubbed "dynamic complexity". Dynamic complexity describes "situations where cause and effect are subtle, and where the effects over time of interventions are not obvious".[63] These attributes are effectively a characterization of the conditions of conflict as understood today. Senge concludes, however, that most traditional methods of analysis, like IPB and OPP, "are not equipped to deal with dynamic complexity".[64] Dynamic complexity models focus on patterns and interrelationships instead of relying on linear cause and effect relations. They do not seek immediate consequences for action, but

expect delays between actions and their outcomes. They look for patterns of change instead of imposing template based snapshots in time and space like those used in IPB.

Others argue as well that complex problems should be dealt with by focussing on system dynamics and on patterns and regularities that can be observed. Conflict scenarios and combat operations fall within a framework described as "complex adaptive systems". Complex adaptive systems are not deterministic (that is they live in a world of chance), and include elements (in this case, forces of politics, peoples and militaries) that are thinking, that interact, that learn and that modify their behavior over time.[65] While long term outcomes may be unpredictable, they can be traced back to early conditions and actions. Complex adaptive systems theory can provide clues on how to deal with the uncertainty that abounds in operations. Wargaming can evolve beyond the uniquely military linear cause and effect process employed today, and move instead towards a format that focuses on relationships, patterns and potential enemy interactions. This form of wargaming was employed with some limited success by UN forces in the Former Republic of Yugoslavia in 1995. On this occasion, players represented the political, civil and military components of the warring factions and sought to recognize the relationships of these various elements within and between factions. The wargame permitted a more comprehensive assessment of faction motives and intentions, and resulted, with some effort, in a more accurate assessment of warring faction actions and outcomes.[66]

While the nature of warfare can remain characterized by some lasting truths, "we must also recognize that our understandings, images and mental models of the world are undergoing rapid evolution in the Information Age as new paradigms, images, representations, and frameworks emerge".[67] When these factors are considered against the current processes, it becomes self-evident that the OPP and IPB function within a mental model that is not well suited for today's dynamic complexity. Those parts of the planning process that deal with the understanding and incorporation of enemy factors in decision-making are a product of US AirLand Battle doctrine, and its embedded

assumptions. Today's doctrine considers small wars to be "wars writ small". It applies major theatre of war concepts to the full spectrum of operations and, as a result, attempts to assume away the complexity that prevails in contemporary conflict.[68] This one size fits all approach to OPP leaves commanders and staffs to develop their own unique solutions to deal with this complexity, and fails to equip them with the structures, tools, and skills needed to function effectively in this environment.

Military forces must not be compelled to execute doctrine in a lockstep manner, rather they must seek means to develop structures and processes that support problem solving in a complex and adaptive environment. While technical intelligence systems continue to seek more detail, a military's intellectual means must focus on the ability to learn and to identify patterns and relationships. The status quo, as critiqued by theorists and demonstrated through a decade of operational experience, does not meet contemporary needs. The planning process, as well as those who employ it, must foster a learning environment and produce, when necessary, new doctrine. For "… war through ages has been a battle of doctrines. The really decisive successes have come to those who adapted a new doctrinal concept to which their enemies were unable to respond."[69] Now is the time to challenge OPP and IPB working assumptions with a view to either arriving at a new mental model, or to adopting a new doctrinal approach that supports more effective planning and operational decision-making.

Structure

Managing complexity is more than an issue of process. Militaries deal with complexity through organizational change as well, usually through structural growth. Limitations in the contemporary operational staff structure, however, are a principal limiting factor in the military's ability to develop a comprehensive understanding of the enemy and to deal with the uncertainty the enemy will seek to create. Operational staffs must be an extension of the commander. They must seek the information he/she needs, see what he/she sees, share in his/her responsibility for mission

success and allow him/her to command from the position where he/she can best influence operations.[70] This challenge is daunting because the breadth of information a commander requires has grown substantially beyond that available through conventional military means. As well, the complexity of information has outstripped the conventional staff structure's ability to manage it.[71] New operational demands have led the US military to acknowledge the need for partnering with civil organizations.[72] Indeed, some have signed onto the notion of going beyond partnering, to the creation of an integrated civil-military command structure for operations other than war.[73]

Even in light of these observations, US experience in Bosnia has highlighted the challenge of building a staff structure and culture, that seeks out and trusts non-traditional sources of information, and that can process this information to make it meaningful to the operational commander.[74] In his study of the operational art and OOTW, Wheeler concluded that it takes a commander's instinct, combined with a close relationship to the political element, to arrive at accurate and timely assessments.[75] CIMIC doctrine speaks to the coordination of civil and military efforts in assessments and operations, however, this coordination is done outside the core of the operational level staff.[76] These factors lead to the conclusive need for non-military expertise within operational staffs. An operational level staff structure that integrates non-military experts who can manage this broader perspective of information, and provide it first hand to commanders in support of their decision-making process, has yet to be created.

An equally important structural limitation is created by western militaries' propensity to rely on technical intelligence sources for information. Technical means have been developed to look primarily for the physical indicators that support conventional IPB products. These indicators, on their own, provide a narrow view of a potential adversary or enemy and do not meet the full range of information requirements that fall out of complex political-societal environments.[77] Effective information gathering in complex environments will be based on labour intensive human intelligence (HUMINT), a form of intelligence better suited to deal with the more intangible and moral factors of

conflict.[78] Recent experiences in Panama, Somalia and Kosovo illustrate this point quite effectively.[79] Despite a fairly universal acceptance of these observations and conclusions, HUMINT resources remain under-manned and one of the single most significant limitations to effective information collection.[80]

Another structural limitation is the inability of command and control systems and planning tools to track the non-military elements of the battlespace that one must reasonably expect to be there. These non-military actors include international organizations and non-governmental organizations as well as the region's indigenous population and civil/political bodies. These elements and organizations are characterized by some as 'white forces'. Contemporary wargames do not accommodate white force tracking nor do they acknowledge their interaction with, and effects on, military forces.[81] Command and control systems are terrain, and friendly and enemy force-centric. They do not represent an image or the effect of white forces in a commander's situational awareness.[82] It has been suggested that the greatest potential for improving the military's ability to deal with full spectrum operations is in expanding the command and control and intelligence systems' capabilities to include full spectrum situational awareness (political, civil, and military). Even greater improvements can be realized by integrating these systems with those of the political and civil agencies involved in conflict management.[83] Current Canadian command and control systems developments are focussed primarily at the tactical level under a military-centric operational level framework. These systems do not acknowledged the prospects of incorporating civil features, nor do they recognize the possibilities this capability could generate.

Education

Perhaps the most lasting improvement to dealing with complexity lies in developing the qualities of operational commanders and staff. Instead of conforming to western expectations, adversaries will seek to deny information, misinform, reject western laws and practices, and

potentially act outside what would be considered social norms.[84] Clausewitz' chapter on military genius is particularly relevant here as it speaks to the qualities of <u>intuition and determination</u> required to succeed in this environment. As Clausewitz states: "Taken together these two qualities give the commander the "presence of mind" he needs to deal with the unexpected that is so much a part of the atmosphere of war".[85]

While there is little in learning theory on the cultivation of genius and intuition, there has been some work done within the discipline of cognitive science to identify the qualities and attributes that define experts.[86] Experts are described as those who can make both rational and non-rational decisions; rational decisions being those based on known facts, and non-rational decisions being those based on intuition or judgement alone. One school of thought attributes the skill of intuition to an individual's self-awareness and self-monitoring; attributes that engender the analytical ability to solve problems <u>without basic information</u>. Another school of thought sees intuition as the ability to reason forward from that which one already knows. In this case the <u>knowledge base is critical</u>. In general, however, experts agree that the truth on the source of intuitive skill lies somewhere in the middle of these two extremes. In practise, they see the need for specific knowledge as well as the need for intellectual tools to deal with atypical situations for which little information exists.[87] To deal effectively with the complexities presented by contemporary conflict, commanders must maintain a foundation of expert knowledge across the full spectrum of conflict. This foundation allows them to draw logical conclusions based on known factors. At the same time, they must nurture and develop those intuitive skills that enable them to function effectively in those all too frequent circumstances for which information is lacking, misleading, or false. It is intuition that enables commanders to reason forward from that which they do know, to recognize that which they do not know, and to postulate more accurate assessments or outcomes of enemy actions.

Theorists suggest that the environment required to develop intuition must be based on small group dynamics where the focus is on the need to explore new ideas and to take chances without fear

of failure. One of the best tools for supporting this development process is the regular use of wargames, played without the encumbrance of role playing or staff functions.[88] Wargames, designed with an educational intent, can provide the basis for developing intuition and an inherent understanding of the operational art. These wargames, however, need to be simpler than the more sophisticated models in use today. Contemporary wargaming is designed to support large staff planning activities and to promote large-scale collective training events. Militaries need to invest in a wargaming architecture that has development of intuition as its principal objective. In Canada, this architecture and its associated learning environment is immature at best, if it exists at all. It is time to consciously include development of intuition as an objective of the professional development system and to include these development opportunities at every stage of professional life.

Potential adversaries and the evolving security environment will continue to increase the degree of complexity in operations. Process change, improvements in organizational structure and a focus on developing intuitive skills in commanders and staffs represent some of the measures that can be taken to improve the military's ability to deal with this complexity.

Conclusion

Failure to grasp the true essence of an enemy or to accurately visualize both what he/she is capable of and willing to do can lead, and has led, to unexpected, or indeed disastrous results. The OPP ignores the factors that determine an enemy's will to fight, and fails to consider the effect of will on enemy actions. The planning process assumes much with respect to a commander and staff's ability to predict enemy actions, principally by ignoring civil and political factors as well as the moral equation. The mental model that characterizes the planning process is based on cold war assumptions. These assumptions are due for reevaluation and doctrine writers must consider either updating the model that represents the OPP, or moving to another construct that deals more effectively with the realities and complexities of contemporary operations.

Current operational staff structures do not provide the full range of staff qualities needed to deal with modern conflict's civil-military environment. Command and control and decision support tools do not make accommodation for information on "white forces", those elements of the battlespace, though non-military, that have such a tremendous influence on both enemy and friendly forces. Operational level staffs need to include non-military specialists who can represent, track and incorporate non-military elements and factors directly into the planning process. They must be supported by command and control systems capable of monitoring and tracking both military and non-military information.

Doctrine's greatest shortcoming is its failure to maximize the contribution of the commander in the planning process. Today's OPP does not fully apply the commander's intuition and genius to the process and the staff is regularly left to make assumptions on the commander's behalf, particularly during wargaming. The OPP is meant to be, first and foremost, a tool to enable a commander to understand the enemy, visualize his options, and decide on a way ahead. Its secondary purpose is to support the staff in developing detailed plans. By combining the two objectives into one single process, the OPP does a disservice to the former that renders the latter of little use when the enemy does not conform to expectations. The commander's role in planning needs to be redefined and the process must clearly separate that which is of direct service to command decision-making from that which is designed to serve the staff.

Understanding the enemy and incorporating that understanding into planning and decision-making remain complex undertakings. The ways and means supporting this endeavour have serious shortcomings that must be addressed. As pointed out earlier by Senge, mental models, like OPP and IPB, require regular surfacing, testing, and improving if they are to remain effective. Now is the time to test, resurface and improve the ways operational forces plan, and now is the time to provide operational commanders new means to manage the process' unavoidable complexity.

---

[1] Sun Tzu, <u>The Art of War</u>, trans. Samuel B. Griffith (Oxford: Oxford University Press, 1963) 129.

[2] Carl Von Clausewitz, <u>On War</u>, Translated by Michael Howard and Peter Parret (Princeton, NJ: Princeton University Press, 1984) 117.

[3] Michael I. Handel, <u>Masters of War: Sun Tzu, Clausewitz and Jomini</u>, (Portland, OR: Frank Cass, 1992) 18

[4] Fritz J. Barth, "A System of Contradiction", <u>Marine Corps Gazette</u> Vol 82 Apr. 1998: 29.

[5] Brendan O'Shea, <u>Crisis At Bihac</u>, (Bridgend, UK: Sutton Publishing, 1998) 228.

[6] Lauri J. Snider, "An Assessment of Intelligence Preparation of the Battlefield Doctrine for Humanitarian Assistance Operations", School of Advanced Military Studies, Leavenworth, Kansas, 1995, 8. and Thomas M. Cook et al., "Cognitive Representations of Battlespace Complexity: Six Fundamental Variables of Combat", Army Research Laboratory, Aberdeen MD, 2000, ii.

[7] CFC 106, <u>Canadian Forces Operations Planning Process</u>, 1-6/9.

[8] CFC 106, 8-A-1/9.

[9] Snider 10 – 13.

[10] Snider 14.

[11] Cook 5.

[12] Snider 34.

[13] Amelia C. Nutt, David B. Colling, Willie L. Molse, "Low Intensity Conflict Instability Indicators Study", Langley, Virginia, 1992, xi.

[14] Max G. Manwaring, "Peace and Stability Lessons from Bosnia", <u>Parameters</u> 28 (Winter 98/99): 29.

[15] Manwaring 34.

[16] Jack F. Smith, "Clausewitzian Trininty: A Vague Concept or a Tool for the Attack", School of Advanced Military Studies, Leavenworth, Kansas, 1993, 20.

[17] Smith 39.

[18] Bruce Menning, <u>Bayonets Before Bullets</u>, (Bloomington, IN: Indiana UP, 1992) 203.

[19] Smith 10.

[20] Clausewitz 89.

[21] Smith 27.

[22] Smith 29.

[23] Daniel E. Liddell, "Operational Art and the Influence of Will", <u>Marine Corps Gazette</u> 82 (Feb. 1998): 54.

[24] Clausewitz 77.

[25] Liddell 54.

[26] Ken Booth, <u>Strategy and Ethnocentrism</u>, (New York: Holmes & Meier Publishers, 1979) 17.

[27] Booth 52.

[28] Booth 53.

[29] Lawrence A. Yates, "Military Stability and Support Operations: Analogies, patterns and recurring themes", <u>Military Review</u> 77 (Jul/Aug 1997): 60.

[30] Booth 101.

[31] Field Manual 34-130, <u>Intelligence Preparation of the Battlefield</u>, A-1.

[32] Sun Tzu 88.

[33] Robert A. Rosenwald, "Operational Art and the Wargame: Play Now or Pay Later", School of Advanced Military Studies, Leavenworth, Kansas, 1990, 13-14.

[34] Walter E. Kretchik, "The Manual Wargaming Process: Does Our Current Methodology Give Us the Optimum Solution?", School of Advanced Military Studies, Leavenworth, Kansas, 1992, 14.

[35] Rosenwald 17.

[36] Rosenwald 17-18.

[37] Ng Kok Wan, "Using Decision Trees to Direct the Planning-Thought Process: An Enhancement to the Planning Methodology", US Army Command and General Staff College, Leavenworth, Kansas, 1995, 3.

[38] Kretchik 6.

[39] Kretchik 8.

[40] Kretchik 11.

[41] Wan 3.

[42] Wan 4.

[43] Wan 24-25.

[44] Clausewitz 134.

[45] John E. Frame, "Gazing Into The Crystal Ball Together: Wargaming and Visualization For The Commander and Staff", School of Advanced Military Studies, Leavenworth, Kansas, 1996, 12.

[46] Liddell Hart, <u>Thoughts on War</u>, (London: Faber and Faber, 1944) 150.

[47] Frame 35.

[48] Rosenwald 15-16.

[49] Kretchik 39.

[50] Kretchik 22.

[51] Wan 31.

[52] Kretchik 27.

[53] Maggie Belknap, "The Force-On-Force Model: An Anachronism in the Information Age", <u>Joint Forces Quarterly</u> Spring 1997: 117.

[54] Rosenwald 4-6.

[55] Rosenwald 40.

[56] Belknap 119.

[57] Peter P. Perla, <u>The Art of Wargaming</u>, (Annapolis, MD: United States Naval Institute, 1990) 180.

[58] Clausewitz 578.

[59] Peter Senge, "<u>The Fifth Discipline. The Art & Practisce of the Learning Organization</u>, (New York: Currency/Doubleday, 1990) as referred by Snider 38.

[60] Senge as referred by Snider 39.

[61] Senge as referred by Snider 39.

[62] Snider 39.

[63] Senge as referred by Snider 40.

[64] Senge as referred by Snider 40.

[65] Cook et al. 7.

[66] Hugh Richardson, "United Kingdom Operational Analysis Techniques in Bosnia", <u>Analytic Approaches to the Study of Future Conflict</u>, ed. Alexander Woodcock and David Davis, (Clementsport, NS: Canadian Peacekeeping Press, 1996) 78-86.

[67] Cook 7.

[68] Wray R. Johnson, "Warriors Without a War: Defending OOTW", <u>Military Review</u> 78 (Dec. 1998-Feb. 1999): 71.

[69] John A. Warden, <u>The Air Campaign, Planning for Combat</u>, (Washington, DC: National Defence UP, 1990) 131.

[70] Frame 11.

[71] John A. Gentry, "Knowledge Based Warfare: Lessons From Bosnia", <u>The Officer</u> Jan./Feb. 1999: 137. and Jennifer Morrison Taw, "Operation Just Cause: Lessons for Operations Other Than War", (RAND report for the US Army, 1996) 18.

[72] Kenneth H. Pritchard, "The Army and Civil Military Operations in the 21st Century", <u>Army</u> Dec. 1997: 6.

[73] David Last, "Organizing for Effective Peacebuilding", a paper prepared for <u>International Peacekeeping</u>, (Royal Military College of Canada, 2000): 11/21.

[74] Gentry 142.

[75] J.R. Wheeler, "Is the Operational Art Applicable to Operations Other Than War", Canadian Forces College, Toronto, ON, 1997.

[76] B-GG-005-004, <u>Civil Military Cooperation in Peace, Emergencies, Crisis and War</u>, 1-14/1-15.

[77] Gentry 142.

[78] Robert J. Bunker, "Rethinking OOTW", <u>Military Review</u> Nov./Dec. 1995: 38.

[79] Taw 19. and Fritz J. Barth, "A System of Contradiction", <u>Marine Corps Gazette</u> 82 (Apr. 1998): 27. and Report to Congress, "Kosovo/Operation Allied Force After-Action Report", 31 January, 2000, 116.

[80] Jonathan B. Hunter, "The Doctrinal Functions of Intelligence: Are They Applicable to Peacekeeping and Peace Enforcement Operations?", School of Advanced Military Studies, Leavenworth, Kansas, 1993, 38.

[81] Michael K. Robel, "Simulating OOTW", <u>Military Review</u> Nov./Dec. 1995: 53.

[82] Robert C. Morris, Jr., "Tower of Babel: Much Information-Sharing Work Needed In Humanitarian Operations", <u>Armed Forces Journal International</u> May 2000: 46.

[83] Johnson 72. and Michael Smith and Melinda Hofstetter, "Conduit or Cul-de-Sac? Information Flow in Civil-Military Operations", <u>Joint Forces Quarterly</u> Spring 1999: 101.

[84] Bunker 38.

[85] Clausewitz 103.

[86] Rosenwald 8.

[87] Lauren B. Resnick, <u>Education and Learning to Think</u>, (Washington, DC: National Academy Press, 1987) 46.

[88] Rosenwald 37-38.

BIBLIOGRAPHY

Booth, Ken <u>Strategy and Ethnocentrism</u>. New York: Holmes & Meier Publishers, 1979.

von Clausewitz, Carl. <u>On War</u>. Ed. And Trans. Michael Howard and Peter Paret. Princeton: Princeton University Press, 1984.

Handel, Michael I. <u>Masters of War: Sun Tzu, Clausewitz and Jomini</u>. London and Portland: Frank Cass, 1992.

Hart, Liddell. <u>Thoughts on War</u>. London: Faber and Faber, 1944.

Juday, Tim. <u>Kosovo</u>. New Haven: Yale UP, 2000.

Menning, Bruce. <u>Bayonets Before Bullets</u>. Bloomington: Indiana UP, 1992.

O'Shea, Brendan. <u>Crisis At Bihac</u>. Bridgend: Sutton Publishing, 1998.

Perla, Peter P. <u>The Art of Wargaming</u>. Annapolis: United States Naval Institute, 1990.

Oliver, D. and Roos, J. <u>The Poised Organization: Navigating Effectively on Knowledge Landscapes</u>. Atlanta: 1996.

Resnick, Lauren B. Education and Learning to Think. Washington: National Academy Press, 1987.

Richardson, Hugh. "United Kingdom Operational Analysis Techniques in Bosnia." Analytic Approaches to the Study of Future Conflict, ed. Alexander Woodcock and David Davis, Clementsport: Canadian Peacekeeping Press, 1996.

Senge, Peter. The Fifth Discipline. The Art & Practice of the Learning Organization. New York: Currency/Doubleday, 1990.

Sun Tzu. The Art of War. Trans. Samuel B. Griffith. Oxford: Oxford University Press, 1963.

Warden, John A. The Air Campaign, Planning for Combat. Washington: National Defence UP, 1990.

Barth, Fritz J. "A System of Contradiction."   Marine Corps Gazette 82 Apr. 1998.

Belknap, Maggie. "The Force-On-Force Model: An Anachronism in the Information Age." Joint Forces Quarterly Spring 1997.

Bunker, Robert J. "Rethinking OOTW."   Military Review Nov./Dec. 1995.

Gentry, John A. "Knowledge Based Warfare: Lessons From Bosnia." The Officer Jan./Feb. 1999.

Johnson, Wray R. "Warriors Without a War: Defending OOTW." Military Review 78 Dec. 1998-Feb. 1999.

Last, David. "Organizing for Effective Peacebuilding." a paper prepared for International Peacekeeping, 2000.

Liddell, Daniel E., "Operational Art and the Influence of Will." Marine Corps Gazette   82 Feb. 1998.

Manwaring, Max G. "Peace and Stability Lessons from Bosnia." Parameters 28 Winter 1998/1999.

Morris, Robert C. Jr. "Tower of Babel: Much Information-Sharing Work Needed In Humanitarian Operations." Armed Forces Journal International May 2000.

Pritchard, Kenneth H. "The Army and Civil Military Operations in the 21st Century." Army Dec. 1997.

Robel, Michael K. "Simulating OOTW." Military Review Nov./Dec. 1995.

Smith, Michael and Hofstetter, Melinda. "Conduit or Cul-de-Sac? Information Flow in Civil-Military Operations." Joint Forces Quarterly Spring 1999.

Yates, Lawrence A. "Military Stability and Support Operations: Analogies, patterns and recurring themes." Military Review 77 Jul./Aug. 1997.

Cook, Thomas M. et al. "Cognitive Representations of Battlespace Complexity: Six Fundamental Variables of Combat." Diss. Army Research Laboratory, Aberdeen, 2000.

Frame, John E. "Gazing Into The Crystal Ball Together: Wargaming and Visualization For The Commander and Staff." Diss.   School of Advanced Military Studies, Leavenworth, Kansas, 1996.

Hand, Richard A. "Operation Allied Force: A Theoretical Review of Doctrine and Airpower." Diss. Naval War College, 2000.

Hunter, Jonathan B. "The Doctrinal Functions of Intelligence: Are They Applicable to Peacekeeping and Peace Enforcement Operations?" Diss. School of Advanced Military Studies, Leavenworth, Kansas, 1993.

Kretchik, Walter E. "The Manual Wargaming Process: Does Our Current Methodology Give Us the Optimum Solution?" Diss.   School of Advanced Military Studies, Leavenworth, Kansas, 1992.

Nutt, Amelia C., Colling, David B. and Molse, Willie L. "Low Intensity Conflict Instability Indicators Study." Diss. Langley, Virginia, 1992

Rosenwald, Robert A. "Operational Art and the Wargame: Play Now or Pay Later." Diss. School of Advanced Military Studies, Leavenworth, Kansas, 1990.

Smith, Jack F. "Clausewitzian Trininty: A Vague Concept or a Tool for the Attack." Diss. School of Advanced Military Studies, Leavenworth, Kansas, 1993.

Snider, Lauri J. "An Assessment of Intelligence Preparation of the Battlefield Doctrine for Humanitarian Assistance Operations." Diss. School of Advanced Military Studies, Leavenworth, Kansas, 1995.

Taw, Jennifer Morrison. "Operation Just Cause: Lessons for Operations Other Than War." Diss. RAND report for the US Army, 1996.

Wan, Ng Kok. "Using Decision Trees to Direct the Planning-Thought Process: An Enhancement to the Planning Methodology." Diss. US Army Command and General Staff College, Leavenworth, Kansas, 1995.

Wheeler, J.R. "Is the Operational Art Applicable to Operations Other Than War." Diss. Canadian Forces College, Toronto, 1997.

Report to Congress. "Kosovo/Operation Allied Force After-Action Report." 31 Jan. 2000.

Field Manual 34-130. Intelligence Preparation of the Battlefield.

B-GG-005-004. Civil Military Cooperation in Peace, Emergencies, Crisis and War.

CFC 106. Canadian Forces Operations Planning Process.