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Coping With Uncertainty: Command at The Operational Level

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Abstract

Did the 1990s lull us into a false sense of predictability and certainty? Did the ever climbing stock markets or a constant reduction in crime, to name but two examples, allow us to believe that uncertainty had vanished? Both the recent stock market collapse and the murderous exploits of the Washington sniper serve to remind us that uncertainty remains a constant feature of life. Throughout history, uncertainty has been a significant feature of military operations and it is likely to be one in the future. How is it, then, that commanders, at the operational level, cope with uncertainty?

This essay challenges the myth that technology, or any other single method, will eliminate uncertainty for the commander. The best we can hope to do is to manage uncertainty in a way that allows us to cope, and in certain cases reduce it. This is simply not possible if one takes a narrow approach. By necessity, the approach must be broad, and the solutions, from various disciplines, must interconnect. Ideas for coping come from study across a broad range of history, technology, behavioral science, and the experience of others. No one discipline has all the answers - the aim of this paper is to demonstrate that coping with uncertainty requires solutions from across this broad range. While many methods are enunciated in this paper, let us realize the full potential of our collective capability as a priority. Clearly, coping can be greatly enhanced through special emphasis on group interaction.

Uncertainty – Introduction

Is uncertainty a significant command challenge at the operational level? Martin Van Creveld, an accomplished military historian, maintains that, " The history of command in war consists essentially of an endless quest for certainty."[1] Others agree and question whether command might be an irrelevant act without uncertainty as a constant factor.[2] If uncertainty is significant, how do commanders, and staff, cope with it as they work to accomplish their mission? Will the information age, with a technological God's eye view of the entire battlefield, provide perfect situational awareness, thereby eliminating uncertainty?[3] Perhaps better solutions are found in history books, or maybe from behavioral science?

This paper looks to address these questions. My research indicates that coping with uncertainty demands knowledge beyond a few simple axioms. Did the 1990s lull us into a false sense of predictability and certainty? Did the ever climbing stock markets or a constant reduction in crime, to name but two examples, allow us to believe that uncertainty had vanished? Robert Samuelson, in a recent Washington Post article, believes that both the recent stock market collapse and the murderous exploits of the Washington sniper help to demonstrate that uncertainty remains a constant feature of life.[4] One must be cautious in thinking that uncertainty has been eliminated as we begin the 21st Century.

This essay challenges the myth that technology, or any other single mechanism, will eliminate uncertainty. We need to think of ways to reduce, and cope with uncertainty. By necessity, ideas for coping come from study across a broad range of history, technology, behavioral science, and the experience of others. No one discipline

has all the answers - the aim of this paper is to demonstrate that coping with uncertainty requires solutions from across this broad range of disciplines.

As surely as each individual is different, coping solutions are different for each individual. This paper will increase the reader's awareness to the wide range of possible methods, but it cannot provide a detailed prescription, and it cannot consider every possible idea. My intent is to frame the discussion around the operational level - across the spectrum of conflict, but I do believe that many of the ideas contained in this paper are applicable to all levels.

This paper has four sections. The first section entitled, Uncertainty – A Part of Command, will confirm the importance of uncertainty to early theorists through to current Canadian doctrine manuals. The second section uses historical examples to establish the nature of uncertainty at the operational level.

The third section will provide a basic understanding of uncertainty from a human perspective. Let us consider what causes humans to be uncertain before introducing any ideas on how to deal with it. Finally, in the fourth section, I will get to the ideas for coping. In sum, all of this should allow the reader to reasonably conclude that coping with uncertainty is important, and solutions, by necessity, come from a broad approach. We must consider an approach that emphasizes the shared responsibility of groups - in particular the commander with his subordinates, and staff – as critical to the effort.

Uncertainty – A Part of Command

This section recognizes the views on uncertainty held by early theorists, a WW II commander - Field Marshal Sir William Slim, and a historian - Martin Van Creveld. It also recognizes the views present in Canadian doctrine.

Two renowned theorists of war have blunt predications on uncertainty. For Clausewitz his dictum that "a great part of information obtained in war is contradictory, a still greater part is false, and by far the greatest part is uncertain" remains straightforward.[5] Clausewitz considers it impossible to apply scientific models to the theory of war in an effort to reduce uncertainty.[6] In a similar vein, Mao Tse-Tung recognizes that there is no absolute certainty in war.[7] In his view, uncertainty interferes with even the best-laid plans, and that the military commander must be ready to change plans frequently.[8] This introduces the idea of adaptability, as a coping mechanism, and is discussed more fully later in the paper. Clearly, early theorists recognized the challenge of uncertainty in war, and I believe their predictions are still valid today across the spectrum of conflict.

Field Marshal Sir William Slim, the Supreme Allied Commander Ground Forces in Southeast Asia (1945-1946), determined that commanders must make decisions in the face of great uncertainty.[9] He believed that half the information you have in war is wrong, and that all sorts of elements over which you have no control, such as the weather, and to a certain extent the action of the enemy, are constant.[10] Slim's opinion will be reinforced with historical examples in the next section.

Martin Van Creveld, a noted military historian, concludes that a commander is constantly searching for certainty - certainty about the intentions of the enemy force;

certainty about the environment, and last but not least certainty about the state, intentions and activities of one's own forces.[11] This last point is an interesting observation. Coalition partners can be the cause of great uncertainty, as we will see in the next section.

As a last step, let us consider two Canadian Forces publications. The doctrinal publication Canadian Forces Operations describes force employment at the operational level.[12] It points out that CF personal must understand the concepts, doctrine and procedures for planning, organizing and conducting joint and combined operations.[13] I assumed that this would include some guidance on the challenges one might face. Unfortunately, the publication mentions little about uncertainty – in fact, I failed to find any mention of uncertainty. To be fair, the CF does recognize uncertainty by acknowledging that Canada, in the future, will need psychologically hardened troops capable of dealing with uncertainty.[14] It does strike me as odd that the CF doctrinal publication on operations says so little about uncertainty!

In a review of Canadian Army publications, I was rewarded with an explicit acknowledgement on uncertainty. Canada's Army instructs that despite the revolutionary advances in information processing and data processing, knowledge, and information about the enemy or situation will remain finite and subject to probabilities. [15]

reasonable advice, but is that it? Are there other important ideas available to help us reduce or cope with uncertainty? This paper provides more ideas on the matter.

It is reasonable to conclude, from this section, that uncertainty is a significant part of command. The next section highlights the nature of uncertainty, at the operational level, by using historical examples.

Uncertainty – At the Operational Level

What is the nature of uncertainty at the operational level? Compared to the tactical level, the operational commander prepares plans further in advance, and his area of operations is normally larger. He has to predict future events deeper in time, and space. The operational commander must interface with the higher level to convert and translate strategy into meaningful direction for the tactical level. It is arguable that the uncertainty faced by an operational commander may be more significant than that found at the tactical level. The following examples will demonstrate the nature of this uncertainty.

Uncertainty at the operational level can be all consuming. In 1992, Major General Lewis Mackenzie, as Chief of Staff UNPROFOR, when asked during a press interview if he could tell the interviewer what was happening in Sarajevo responded, "…. that's a bit hard to say. I know what is happening right now in this bunker, which I am sharing with about 150 other people. I know shells are landing around the building and in a few cases on this building; otherwise, we would not be down here. Aside from that, perhaps you can tell me from your sources what you think is going in Sarajevo."[17] Uncertainty for General Mackenzie arrived from a situation that was very confused and out of control as the Bosnian Serbs rained down artillery fire on Sarajevo.[18] Add to this Lieutenant General Romeo Dallaire's experience, as Commander UNAMIR in 1993-94, enforcing a

mandate that the belligerent parties did not fully support – varied interpretation of the mandate led to considerable uncertainty on a daily basis.[19] In such an environment, he concludes that commanders who insist on clear mandates and unambiguous decision processes should not be involved in conflict resolution, because the challenges they will face will be too complex. [20] Clearly, uncertainty can be a significant feature at the operational level.

If the operational level involves combined forces then we should be prepared for uncertainty. General Jacob L. Devers – the Deputy Supreme Allied Commander in the Mediterranean – witnessed considerable uncertainty. The conflicting views of Allied governments as to the basic strategy of WW II fueled a lengthy debate on who to destroy first – Germany or Japan. [21] Uncertain, Devers found it extremely hard to plan and to make decisions with any degree of firmness.[22] Devers deduced, from this experience, that strategic uncertainty in a coalition setting would always exist, " … nations and humans being what they are, the future can hold no prospect for improvement."[23] Devers also pointed out that coalition uncertainty influenced senior military leaders in his formation.[24] "Military leaders will maintain their first loyalty to their own country and will naturally cast a critical eye on decisions taken by the operational commander."[25] In a second example, let us consider the NATO led IFOR dispatched to Bosnia in 1995. Doctrine, cultural, and language differences challenged the overall coordination of the mission, and caused uncertainty for the participants who were not able to speak, or understand English.[26] If the operational level commander has subordinate commanders, and staff that are uncertain, or suspicious of the direction issued then bridging these difficulties toward

a common intent becomes vital. These two cases show the potential nature of uncertainty in a combined setting.

What appears certain at the strategic level may not be so clear at the operational level. Despite an overwhelming military victory in the Gulf War, uncertainty confronted General Schwarzkopf. Would Iraqi ground forces stand and fight? The White House policy-makers believed that Iraqi ground troops were teetering and about to collapse. [27] In hindsight, this was the correct assessment. At the time, General Scharwzkopf was advised by his intelligence staff to expect stiff resistance from the Iraqi army – it caused considerable uncertainty for Schwarzkopf and he changed his view on their resolve several times.[28] In the end, Schwartzkopf designed his ground campaign on the premise that the Iraqi army would stand and fight. Only the Iraqi soldiers knew the real story. They hoped their deployment to the desert was no more than an elaborate bluff.[29]

Finally, let us consider a brief example of uncertainty, introduced by technology, in Operation Allied Force, the NATO air campaign over Kosovo and Serbia in 1999. It was Admiral James Ellis, C-in-C NATO Allied Forces Southern Europe, who remarked, "too much information has the potential to reduce a military leader's awareness of an unfolding situation."[30] The tremendous amount of data provided via computer and sensors was often not exploited because it could not be interpreted in a timely fashion and transformed into knowledge that the commander could use in his campaign planning and execution.[31] The use of video teleconferencing (VTC) provided another source of confusion and uncertainty. Without written records to document, summarize and confirm key points, confusion existed as to decisions made, on occasion, for those not present at a particular VTC.[32]

In sum, this section has demonstrated that uncertainty can be significant. What appears certain to the strategic level may not seem so to the operational level. Uncertainty appears to be a feature of coalitions, and there are cases where the application of technology has actually created it. Let us now try to better understand uncertainty from an individual, and a group perspective.

Uncertainty – A Basic Understanding

The thrust of this section is three fold. First, we should define what uncertainty is. Since uncertainty affects command, we should also define command, and then try to understand, in some detail, how the two are related. Second, we need to establish some basic facts on human behavior, in regards to uncertainty, within an organization. Finally, we need to consider how uncertainty arises as a conflict to both an individual and an organization, and relate it to the commander and his staff. Perhaps if we understand uncertainty a little better we may have an easier time judging potential ways of coping with it.

What is uncertainty? According to Gary Klein, uncertainty is "doubt that threatens to block action. Key pieces of information are missing, unreliable, ambiguous, inconsistent, or too complex to interpret and as a result a decision maker will be reluctant to act." [33] This is straightforward. Nevertheless, how important is uncertainty to command? Van Creveld figures that the role of uncertainty in determining the structure of command should be – and in most cases is – decisive.[34] It might be best if we understand, in some detail, the relationship of uncertainty to command.

According to Ross Pigeau and Carol McCann, command is "the creative expression of human will necessary to accomplish the mission." [35] Control is "those

structures and processes devised by command to manage risk" – and they define command and control (C2) together as, "the establishment of common intent to achieve coordinated action."[36]

Pigeau and McCann maintain that C2 is in principle uncertain for two main reasons – the actions of humans (both own forces and the adversary) are imperfect, and the physical environment (i.e. the weather) is open and unbounded.[37] Therefore, they see control as a necessary activity to reduce and manage uncertainty in the military domain.[38] The importance of: common intent and the actions of control stand out as we search for coping ideas in the next section. According to Peter Northouse, an accomplished leadership expert, transformational leaders concentrate on sharing a common intent or vision.[39] Transformational leadership could be useful as we consider ideas for coping.

A commander establishes common intent to achieve coordinated action allowing him to accomplish his mission. The commander has a staff to help him develop, issue, and coordinate his plans. He has subordinate commanders who action, in a coordinated fashion, his plans. All of this must operate in a climate of uncertainty. In their book, Organizations, James March and Simon Herbert see uncertainty as one of the major ways conflict arises.[40] In this sense, conflict is defined as the breakdown in the standard mechanisms of decision-making so that an individual or a group has trouble in selecting action alternatives.[41] Essentially this is the problem the commander faces with uncertainty – the inability to determine a suitable course of action (COA).

To better understand this conflict means that we should examine the individual, and the organization within which this individual works. March and Simon, point out the simple idea that, "organizations are assemblages of interacting human beings and they are

the largest assemblages in our society that have anything resembling a central coordinative system." [42] They suggest that any proposition about an organization must first begin with understanding human behavior.[43] Understanding human behavior means viewing the human as a choosing, decision-making, problem-solving organism that can only do one or perhaps a few things at a time and that can process only a small part of the information recorded in its memory, or presented by the environment.[44] In other words, human beings are organisms capable of evoking and executing relatively well-defined programs, but are only able to handle programs of limited complexity. [45]

Relating this simple organism to a commander and his staff, we should consider members of the staff as being capable of handling one, or maybe a few tasks at once. As the Commander seeks to articulate his intent to subordinate commanders, he turns to his staff to seek options for action. As staff officers search for COAs some, or all, may encounter conflict caused by uncertainty. March and Simon advise that at this juncture the staff officer, our simple human organism, will first increase his search for clarification of the consequences of alternatives already established and failing in that, he will increase his search for new alternatives.[46] It less likely that an individual staff officer will encounter difficulty in determining COAs if the matter is not complex, or the staff officer's experience with the matter is comprehensive. [47] It is interesting to note March and Simon's determination that frequent transfers of personnel keep experience at a low level, and an inadequate or inaccessible "memory" accentuates uncertainty.[48] Obviously, the idea of continuity, to maintain as much experience as possible, within staff branches, holds considerable merit.

Finally, March and Simon instruct that if you want individuals in an organization to act on the same premises a formal uncertainty absorption point will be required – there will be a greater need for coordination in the organization that uses legitimized facts.[49] In other words, the need for assumptions, shared with all members of the staff, is essential. Sharing assumptions is a time-honored practice in most military organizations!

To move this discussion from the individual to the group level, March and Simon maintain that if individuals themselves are undergoing conflict internally it maybe that this conflict will not rise to the group level.[50] Conflict via uncertainty, at the group level, requires an absence of individual conflict and can be summarized in terms of three variables: the existence of a positive felt need for joint decision-making and either a difference in goals, or a difference in the perception of reality or both."[51] If subordinates feel that their opinions do not matter they will not be motivated to participate in group activity. We should establish a decision-making climate that permits their full and joint participation. If a joint decision making climate is a worthy goal, where members of a group are encouraged to deliver alternative views, then one should consider, again, the importance of transformational leadership.[52] The commander might be better able to analyze his COAs by considering a range of opinions.

To this discussion, Pigeau and McCann add that reduction in uncertainty implies an increase in order; increased order offers a rational basis for choosing and then optimizing appropriate COAs.[53] In addition, a good control system should try to accomplish its goals faster than an adversary does. This reduces uncertainty and risk by controlling the adversary's actions, and getting inside her decision cycle.[54]

To summarize this section is to understand that coping with uncertainty should consider, first, the human. The human is a simple organism capable of handling a relatively low number of tasks at once. Solutions that increase complexity need careful consideration. Experienced humans who work with common intent, and shared assumptions are important. The very act of control in C2 is an attempt to reduce uncertainty by developing order and maximizing group interaction. It is likely that a transformational leadership style will foster a positive atmosphere for joint decision-making, and maximize important group interaction.

How, then, can we best cope with uncertainty? As we consider solutions, it would be best to keep in mind what we have discovered about humans in this section.

Uncertainty – Coping

We have already reviewed the Canadian Army views on coping with uncertainty. What follows will add new ideas, and in some cases will reinforce some of these established views. As discussed in the introduction, ideas for coping come from a broad examination of history, technology, behavioral science, and the experience of others.

Uncertainty – Coping – Technology

Suggest that technology eliminates uncertainty and you provoke a strong reaction from historians. From a technologist's point of view computer, communications, and sensor technology, with improvement, should provide perfect situational awareness. [55]The idea is that with such knowledge, more effective mission planning is possible and the ability to see a target precisely enough will allow its certain destruction with precise ammunition.[56] The idea of "Dominant Battlefield Knowledge", namely the ability to understand what we see, and act on it decisively, is certainly an attractive sounding

idea.[57] Taken a step further some can envision the use of expert computer systems to handle the routine decision-making freeing up the commander to devote more energy to strategic issues and concerns.[58]

To this promise are words of caution. From Martin Van Creveld comes: " the attainment of certainty is, a priori, impossible."[59] He maintains that we are no more capable of dealing with the information required for command processes than our predecessors were a century ago.[60] Computers cannot measure, fully, the intentions of one's adversary. What happens if we must revert to manual methods when our IT is not working? He considers the proposal that computers and sensors will be able to eliminate uncertainty by providing a clear, unobstructed, and certain view of the enemy as sheer delusion.[61] He maintains that, "in order to attain certainty, one must first of all have all of the relevant information. The more the available information, however, the longer the time needed to process it, and the greater the danger of failing to distinguish between the relevant and the irrelevant …. the true and the false."[62]

I do not believe that technology offers a panacea for eliminating uncertainty. That said technology enables our efforts. For example, it can provide timely data. We need doctrine, and procedures that can convert data into useful information to answer the commander's critical information requirements. This, in part, can help reduce uncertainty. I think it would be naive to discount technology outright. We live in a world that has not discounted the power of technology, and we need to harness its ability to help.

We must understand what technology can offer. Admiral (retired) William A. Owens, Vice Chairman US Joint Chiefs of Staff in 1996, acknowledged that a perfect

understanding of a battlefield is unlikely, and technology should aim to reduce uncertainty for US forces to a greater degree than that experienced by the enemy.[63] For this to work commanders and staff must articulate what information is critical, what is nice to have, what is irrelevant, and what is potentially distracting or confusing.[64] We need to be part of the process – technology cannot help us if we do not define what we want from it. Education and training, devoted to information processing in environments characterized by uncertainty, are necessary to develop the skills to lead, and manage in info-rich situations.[65] The medical community uses the concept of a teaching hospital to improve their professionals – maybe we need to consider the same idea, a teaching operational HQ, where skills are practiced in context of "real world" experience and actions.[66] Obviously, this has applicability too more than just coping with uncertainty.

We may wish to further develop doctrine, display techniques, and decision aids to provide useful information. As discussed, bombarding a human with vast quantities of data is unlikely to reduce uncertainty! [67] In information rich environments new techniques are required. This was reinforced by the 2001 CFC sponsored Air Symposium. Participants concluded that information gathered through ISR will always exceed the capacity to process it; therefore, effective filter systems will be required to convert as much raw data as possible into information. To avoid getting information that is "neat to know" instead of information that is "need to know," commanders must clearly understand then articulate the information they require to achieve situational awareness.[68]

In sum, technology has much to offer. It is not the single solution for coping with uncertainty. I think the key idea is the importance of education, and training. How else

can we guide development efforts, or more importantly understand the limitations? Do we, the "operators", in the CF have a sufficient understanding of current technology? Career experts maintain that every job is now a high tech job![69] If that is true, then a yearly updated guide entitled something along the lines of "Technology for Dummies (read Cols and above)" may help us to maintain currency. If we ignore technology, we run the risk of increasing the very uncertainty we are trying to reduce.

Uncertainty – Coping – Behavioral Science

Let us now consider ideas from behavioral science. Are there attributes that help humans to cope with uncertainty? Do order, common intent, adaptability, or speed of action help one to cope? Can a better understanding of group interaction or transformational leadership offer ideas? How can the study of complexity theory help?

To derive maximum command effectiveness Pigeau and McCann note the requirement for three major factors: competency, authority, and responsibility.[70] Without the authority, and responsibility to act, command is not likely to be effective.[71] For the purposes of this paper, let us assume sufficient authority, and responsibility exists.

Having established that C2 is uncertain and non-linear, four individual competencies are required for command. The first two competencies are physical (strength, sensory motor skills, health, agility, and endurance), and intellectual (planning, monitoring, reasoning, making inferences, visualizing, assessing risks, judgment, flexibility, willingness to learn, and creativity).[72] If we accept uncertainty as a significant command challenge then it is likely that all of these competencies have a role to play in coping with uncertainty. McCann and Pigeau consider creativity as the most important requirement for command.[73]

The final two competencies are emotional (resilience, hardiness, balance, perspective, ability to cope under stress, emotional toughness to deal with risk, and a sense of humour), and interpersonal (leadership, trust, respect, and empathy that promotes effective teamwork). [74] Pigeau and McCann point to emotional competency for success in missions that are ill defined, or operationally uncertain. Commanders will need significant emotional competency if they are to command effectively in such circumstances.[75] Concerning interpersonal competency, Peter Northouse emphasizes the importance of trust in coping with uncertainty – "for organizations, leaders built trust by articulating a direction and then consistently implementing the direction even though the vision may have involved a high degree of uncertainty."[76]

It would be interesting to determine if the CF has put as much effort, and funding into developing the competencies of our personnel as it has into information technology projects that are aimed, in part, at reducing uncertainty. That would be a great subject for another essay! If we accept the idea of competency then it stands to reason that we should develop, thoroughly, our personnel as a means of coping with uncertainty.

While recognizing competency as a factor for effective command, Pigeau and McCann see control as an attempt to reduce uncertainty through structure and process. [77] Processes guided by instituting SOPs, or using software are examples of the use of order, and structure to reduce uncertainty.[78] Operational art and the planning process are examples of structure to help guide us through the rigor of campaign design and the associated uncertainty.

They also emphasize the need of shared intent, adaptability, and speed. In shared intent, Pigeau and McCann see two divisions: explicit intent (i.e. orders), and implicit

intent (i.e. values) as critical to maximizing success. Shared implicit intent is a critical preparatory activity of augmenting education and training with leadership, team building, and continual personal interaction with subordinates with a view to establishing trust, confidence, motivation, creativity, initiative, pride, discipline and esprit de corps.[79] While a commander at the operational level may not have sufficient time to develop implicit intent in such a comprehensive manner, any preparation would prove useful. This reinforces the idea of gathering subordinates for team building exercises.

The idea of adaptability, and creativity in dealing with the "fog" and "friction" of war, the "chaos" of battle, and the complexity of peacekeeping operations is not limited to the behavioral scientists. [80] BGen G.E. Sharpe and Dr A.E. English advise, "C2 structures should be designed so that they can evolve quickly to meet the changing needs. … The unpredictability of future operations requires that any CF C2 system be able to change its control philosophy rapidly to accommodate whatever situations may arise.[81] I think their advice is applicable to the operational level. Maybe we should develop an enthusiasm that permits HQ structures to adapt to the situation as a means of coping with uncertainty. Can we tolerate such adaptability? It is worth thinking about.

Finally with Pigeau and McCann, comes support for the idea that we should try to accomplish our work faster than our adversary, therefore; greatly reducing uncertainty because it controls the adversary's actions.[82] As Boyd's observation-orientation-decision-action (OODA) loop proposes, we should operate inside an adversary's cycle, "to enmesh the adversary in a world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic, chaos … and/or unfold an adversary back inside himself so that he cannot cope with events/efforts as they unfold."[83] This demands that we train ourselves to be quick, and in

some cases, we may need to act before we have a complete and clear picture. This may be a challenge for an operational commander who must wait for strategic direction. In addition, some are not comfortable in making decisions without a complete and clear picture. Despite these limits, working quickly to out pace an adversary is worthy of consideration.

Managing complexity is a field of study that is well populated and overflowing with ideas. My intent is to consider, briefly, two examples - complex responsive processes, and the more mature idea of complexity theory to show what this field has to offer.

In their book, Complexity and Management, Ralph Stacey, Douglas Griffin, and Patricia Stacey are seized by their observation that organizations, "get things done, anyway" despite difficulties, uncertainty, or poor leadership within organizations.[84] They propose that we stop thinking about an organization as a system, and begin to think about organizing as highly complex, on-going processes of people relating to each other.[85] In other words, they consider the processes of people relating to each other as the main reason that things are accomplished. Their research suggests that we stop trying to devise slavish protocols, rigid structures, and reporting disciplines for accomplishing tasks.[86] They do not view the leader/manager as the maker of human choices – the power of getting things done comes from group interaction.[87] Stacey et al refer to this as complex responsive processes (CRP) of people relating to each other, using information and control systems to assist in this relating, and accomplishing joint endeavors actively. [88] They assert that novelty and creativity can be greatly enhanced in such an approach. "The diversity arises in the scope for different interpretations open to people communicating

with each other. Instead of thinking in terms of chance, error or misunderstanding as the generators of variety in communication, we want to think of the ever present, ordinary detailed differences of interpretation as the generators of variety and hence, the source of novelty." [89]

What strikes one about this approach is the emphasis on the team. I will not suggest that we do away with commanders, but the research encourages group interaction as a method of coping with uncertainty. Increased interaction with subordinate commanders during the planning process may facilitate this idea. Maybe a commander needs to interact with all of his staff, and not just the branch heads. Is there merit in promoting a strong interaction routine, within a HQ, for the truly tough and uncertain issues? Transformational leadership, a process whereby an individual engages with others, emphasizes group interaction as a key to success.[90] The reader should reflect on the idea that improving group interaction will help one cope with uncertainty.

In a second example, John Schmitt, in Command and (out of) Control: The Military Implications of Complexity Theory, believes that war is fundamentally uncertain, and uncontrollable.[91] In assessing war as a complex activity, he concludes that war's essential dynamic comes from its being a complex, and distributed system.[92] His paper is worth reading to appreciate the nuances of the Newtonian/mechanistic paradigm versus the nonlinear dynamical system that characterize his view of complexity theory. Briefly, a complex and nonlinear system describes war as being out of control – something that is hard to predict and where uncertainty is a constant.[93] Schmitt espouses that we should not try to impose precise domination over details because details are inherently uncontrollable.[94] I conclude from this that one should not fret over every single

instance of uncertainty! It also points to his suggestion that we not strive for the perfect plan. [95] Building plans that are flexible and cater to change seems a prudent measure. If one is waiting for information to be clear to construct a perfect plan, the wait may be a long one.[96]

In summarizing this lengthy section, one could argue that behavioral science is the most important area to search for ideas on coping with uncertainty. Behavioral science has lots to offer. Developing and nurturing a broad range of competencies, emphasizing creativity, sharing intent, working with speed, nurturing a high tolerance for adaptability, emphasizing transformational leadership, focusing on the joint processes of relating, and accepting a degree of uncertainty as inevitable are all ideas that merit consideration. The importance of group interaction, as a coping mechanism, is essential. The two remaining sections seek to draw out more ideas from the experience of military practitioners, and from a historian.

Uncertainty – Coping – The Experience of Practitioners

Others have coped with uncertainty and succeeded in grand style. One can always learn from the experiences of others.

You will recall that Field Marshal Slim considered uncertainty as a constant in war. He identified several attributes that would serve a Commander at the operational or higher level in good stead. He emphasized: willpower to deal with opposition, judgment to deal with things that matter, flexibility of mind, knowledge, and integrity to gain the confidence of others through simply honesty.[97] This helps reinforce the importance of competency as espoused by Pigeau/McCann. In moments of uncertainty, the Commander must have the willpower to deal with the intergroup conflict that invariably occurs as his

HQ staff, subordinate commanders, and superiors wrestle with the search for viable options. In addition, Slim argued that, "you want an [chief intelligence officer] who will represent to you the mind of the enemy commander."[98] Such a simple idea helps remind us of the value of an outstanding J2.

General Devers' experience at the combined operational level is also instructive. To handle the uncertainty of allied interplay, internal to the operational level HQ, the General advocated that one must begin by knowing the national problems, of coalition members, and their aspirations in detail.[99] He considered the idea of political advisors as crucial because allied officers would not submerge their national pride and aspirations.[100] Can a comprehensive and broad education help? BGen Ken Hague, a recent Commandant of RMC, maintains that education represents the key enabling mechanism for providing a reasoned response to an unpredictable situation - that is, critical thinking in the face of the unknown.[101] Without doubt, this idea is embraced by the CF.[102] Education seems a prudent criteria if we need to boost competency, and deal with the uncertainty of coalition operations. However, what should this education include? We have already considered the importance of technology. A liberal arts education aimed at aiding us to think in situations of complexity, contradiction, and ambiguity seems appropriate.[103] [104] Development from entry level through to DP 4 (including AMSC, and NSSC) should continue to emphasis and refine this type of education.

Lastly, I think it instructive to consider the actions of retired USMC Lt Gen Van Riper, as the enemy force Commander, during a recent computer assisted exercise/experiment conducted by the US Joint Forces Command. In an effort to test new doctrinal concepts, the exercise was almost entirely scripted to ensure a Blue win.[105] Lt

Gen Van Riper was admonished when he attempted to introduce enemy free play because it disrupted, totally, the blue force activities. Understanding that I do not know the full context of this particular exercise, it has been my experience that some CF computer assisted exercises do not allow for enemy free play, and rarely attempt to interject uncertainty from the higher HQ. Are we deriving maximum benefit from our peacetime training events if these two critical factors are absent? Would it not be beneficial to practice coping with uncertainty in a training event?

This section should have convinced you that studying the experience of those before us generates great ideas on how to cope with uncertainty. The study of previous experience requires a commitment to self-improvement – it takes dedication to work through the literature available!

Uncertainty – Coping – Historical Perspective

Last, but not least, are the interpretations by others of past events. History can be a rich source of potential solutions for future challenges. In Command in War, Martin Van Creveld addresses uncertainty in a comprehensive manner stemming from extensive research. He has many suggestions – this paper will offer three of them.

First, he proposes that the best solution in situations of uncertainty is to establish decision thresholds and allow freedom of action as far down the hierarchy as possible.[106] By reinforcing a key attribute of effective command, espoused by Pigeau and McCann, we see the operational level commander's need for authority and responsibility to act. The current CDS, General R.R. Henault, holds a similar view. He suggests that the most important C2 rule for a strategic commander is to let his operational commanders command.[107]

Second, Van Creveld develops the importance of shared implicit intent, and the value of CRP when he recommends, " … carefully selecting men and commanders and allowing them to serve together for comparatively long times to reduce the need of internal communications. … [and allowing for] unstructured interaction among people who know each other well enough in order not to limit their exchanges entirely to the line of business."[108]

Third, Van Creveld offers the idea of a directed telescope as a means of coping with uncertainty. A directed telescope is a metaphor for the commander viewing any aspect of his formation first hand, or through the eyes of a trusted assistant. [109] If the commander can focus on those things critical to the mission then the use of a directed telescope, concentrated on these critical aspects, may preclude improper interpretation by others. The result should be a reduction in uncertainty. Trusted liaison officers, or a formation CWO, are examples of a directed telescope.

In closing this section, Van Creveld's ideas demonstrate the value of good historical analysis in searching for ideas.

Uncertainty – Conclusion

This paper set out to convince the reader that coping with uncertainty – a significant feature of command at the operational level - requires ideas from across a broad range of disciplines. The challenge uncertainty can pose to an operational commander is clear. Across the spectrum of conflict, uncertainty is a likely feature of coalitions. Recent operations have demonstrated that information age technology may actually increase uncertainty! Hope, as a solution, will not be sufficient.

Uncertainty interferes with the determination of suitable COAs to accomplish a mission. To seek solutions that ignore the view of a human as a simple organism, of limited capability, may not be productive. If humans remain the central feature of command at the operational level then behavioural science is a critical source of coping solutions. Developing individual competency must be a priority. To develop the necessary creativity, experience, and abilities to adapt, focus, and work faster, than an adversary, requires a dedicated and well-tuned training regime. Are we prepared to commit to such an effort? The practical applications of transformational leadership, and CRP might be essential to fostering effective group interaction, and encouraging the commander's requirement for alternative points of view.

Technology has a role to play in coping, but it alone cannot eliminate uncertainty. We need to be fully conversant with technology to help direct development efforts and to fully understand its limitations. A passing or vague knowledge of technology will likely be insufficient. If we do not understand technology, it may end up hindering or overwhelming us during operations. How many of us have a detailed knowledge of C2 sensor system capabilities and limitations? Coupled with this is the suggestion that a liberal arts education remain a focus of development during an officer's career. The requirement of a broad education is evident.

The experience of practitioners, combined with the lessons, and interpretations of history let us consider the best of past practices. Accepting uncertainty as a constant, having the willpower to see convictions through in the face of uncertainty, and the necessity to conduct some training with an unconstrained "enemy force" are but three ideas. The importance of having an outstanding J2 and the requirement for political

advisors should be clear. From Martin Van Creveld, comes reinforcement to the importance of authority and responsibility at lower levels, and to the value of group interaction.

The idea that technology, or any other single discipline, can eliminate uncertainty is a dangerous myth. The best we can hope to do is to manage uncertainty by employing methods, as described in this paper, that allow us to cope with it. This is simply not possible if one takes a narrow approach. By necessity, the approach must be broad, and the solutions from various disciplines must interconnect. We must realize the full potential of our collective capability – harness the power of group interaction to help us cope. This paper has provided a broad picture to ensure that the reader's reflection will not be overly narrow. Is it worth considering whether CF level doctrinal publications should focus any attention on coping with uncertainty? I think the answer is obvious.

Notes

[1] Martin Van Creveld, Command in War (Cambridge, Ma: Harvard University, 1985), 264.
[2] Thomas Czerwinski, "Command and Control at the Crossroads," Parameters 26, No. 3 (Autumn 1996), 122.
[3] John F Schmitt, "Command and (Out of) Control: The Military Implications of Complexity Theory," Marine Corps Gazette 82, No. 9 (September 1998), 3.
[4] Robert Samuelson. "Rediscovering Risk., Washington Post. 23 Oct. 2002: A27.
[5] Van Creveld, 266.
[6] Michael I. Handel, Masters of War – Classical Strategic Thought (Portland: Frank Cass, 2001), 83.
[7] Ibid., 246-247.
[8] Ibid., 247.
[9] Field Marshall Sir William Slim, "Higher Command in War," Military Review 70, No. 5 (May 1990), 13.
[10] Ibid., 13.
[11] Van Creveld, 264.

[12] Canada. Department of National Defence. Canadian Forces Operations B-GG-005-004/AF-000 (Ottawa: Department of National Defence, 2000), iii.
[13] Ibid., 1-8.
[14] Commander A. Okras, "Into the 21st Century: Strategic HR Issues." Discussion paper prepared for the Canadian Forces Defence Management Committee (DMC), Ottawa, ON, 3 March 1999.
[15] Canada. Department of National Defence. Canada's Army (Ottawa: Department of National Defence, 1998), 77.
[16] Ibid., 78.
[17] Lewis Mackenzie, Peacemaker: The Road to Sarajevo (Vancouver: Douglas & McIntyre, 1993), 4.
[18] Ibid, 135-136.
[19] Lieutenant-General (retired) Romeo A. Dallaire, "The Theatre Commander in Conflict Resolution," Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership, Ed. Bern Horn and Stephen J Harris (St Catharine's: Vanwell, 2001), 259.
[20] Ibid., 259.
[21] General Jacob L. Devers. "Major Problems Confronting a Theatre Commander in Combined Operations," Military Review 77, No. 1 (January-February 1997), 123-124.
[22] Ibid., 124.
[23] Ibid., 124.
[24] Ibid., 125.
[25] Ibid., 125.
[26] Larry Wentz, Lessons From Bosnia: The IFOR Experience (Washington: National Defence University, 1997), 421.
[27] Michael R. Gordon and General Bernard E. Trainor, The General's War : The Inside Story of the Conflict in the Gulf (Boston: Little, Brown and Co., 1995), 350.
[28] Ibid., 350.
[29] Ibid., 350.
[30] Brigadier G.E. Sharpe and Allan D. English. Principles for Change in the Post-Cold War Command and Control in the Canadian Forces. (Kingston: Canadian Forces Leadership Institute, 2002), 66.
[31] Ibid., 66.
[32] Ibid., 64.
[33] Gary Klein. Sources of Power: How People Make Decisions. (Massachusetts: MIT Press, 2001), 276.
[34] Van Creveld, 268.
[35] Carol McCann and Ross Pigeau, "Clarifying the Concepts of Command and Control." Toronto: Defence and Civil Institute of Environmental Medicine, 1999, 1-2.
[36] Ibid., 1-2.
[37] Ibid., 3.
[38] Ibid., 3.
[39] Peter G. Northouse, Leadership (Thousand Oaks: Sage, 2001), 144-145.
[40] James G. March and Herbert A. Simon, Organizations (New York: John Willey & Sons, 1958), 112.
[41] Ibid., 112.
[42] Ibid., 4.
[43] Ibid., 6.
[44] Ibid., 11.
[45] Ibid., 171.
[46] Ibid., 115.
[47] Ibid., 119.
[48] Ibid., 119.
[49] Ibid., 166.
[50] Ibid., 121.
[51] Ibid., 121.
[52] Northouse, 145.
[53] McCann, "Clarifying the Concepts of Command and Control," 4.
[54] Ibid., 4.
[55] Martin C. Libiki, "DBK and its Consequences," Dominant Battlespace Knowledge. Ed. Stuart E. Johnson and Martin C. Libiki (Washington, DC: National Defence University, 1996), 24.

[56] Ibid., 24.
[57] Lieutenant-General Ervin J. Rokke, "Forward," Johnson.
[58] David S Alberts. "The Future of Command and Control with DBK," Johnson, 85.
[59] Van Creveld, 266.
[60] Ibid., 265.
[61] Ibid., 266.
[62] Ibid., 267.
[63] Admiral William A. Owens, "Introduction," Johnson, 12.
[64] David S Alberts, The Unintended Consequences of Information Age Technologies: Avoiding the Pitfalls, Seizing the Initiative (Washington : National Defence University, 1996), 32-33.
[65] Ibid., 33.
[66] Ibid., 36-57.
[67] Ibid., 34.
[68] Allan D English, "Contemporary Issues in Command and Control." Paper written for the 2001 Air Symposium, Canadian Forces College, Toronto, ON, 2001, 4.
[69] Daniel McGinn. "Fields of Dreams," Newsweek. 22 Sep. 2002: 48.
[70] Carol McCann and Ross Pigeau, "Re-Conceptualizing Command and Control," Canadian Military Journal 3, No. 1 (Spring 2002), 57.
[71] Ibid, 60.
[72] McCann, "Clarifying the Concepts of Command and Control," 7.
[73] McCann, "Re-Conceptualizing Command and Control," 55.
[74] McCann, "Clarifying the Concepts of Command and Control," 7.
[75] McCann, "Re-Conceptualizing Command and Control," 55.
[76] Northouse, 142.
[77] Ross Pigeau and Carol McCann, "Putting Command Back Into Command and Control: The Human Perspective." Toronto: Defence and Civil Institute of Environmental Medicine, 1995, 4-5.
[78] McCann, "Re-Conceptualizing Command and Control," 55.
[79] Ross Pigeau and Carol McCann, "Re-Defining Command and Control," Toronto: Defence and Civil Institute of Environmental Medicine, 1998, 5-6.
[80] McCann, "Re-Conceptualizing Command and Control," 55.
[81] Sharpe, xvii.
[82] Pigeau, "Putting Command Back Into Command and Control: The Human Perspective," 4.
[83] Robert B Polk, " A Critique of the Boyd Theory – Is it Relevant to the Army?" Defense Analysis 16, No 3(December 2000), 5-6.
[84] Ralph D. Stacey, Douglas Griffin and Patricia Shaw. Complexity and Management: Fad or Radical Challenge to Systems Thinking? (New York: Routledge, 2000), 4.
[85] Ibid., 187.
[86] Ibid., 187
[87] Ibid., 187.
[88] Ibid., 187-188.
[89] Ibid., 189.
[90] Northouse, 132-146.
[91] Schmitt, 7.
[92] Ibid., 5.
[93] Ibid., 7.
[94] Ibid., 7.
[95] Ibid., 5.
[96] Ibid., 5.
[97] Slim, 11-17.
[98] Ibid., 19.
[99] Devers, 125-126.
[100] Ibid.,26.
[101] Brigadier-General Ken C Hague, "Strategic Thinking General/Flag Officers: The Role of Education," Horn, 512.

[102] Under key assumptions for the CF Officer Officer Corps and OPD system in 2020 is listed, "education is universally recognized as the most important investment a nation can make." Canada. Department of National Defence. Canadian Officership in the 21st Century Strategic Guidance for the CF Officer Corps and the OPD System. Ottawa: Department of National Defence, 2001, I-7.

[103] Bluffton College. " The Value of a Liberal Arts Education." An official Bluffton College home web site posting extolling the virtues of a liberal arts education. Accessed 14 Oct. 2002; available at www.bluffton.edu/studentlife/career/liberalarts.

[104] As one reviews the key assumptions and implications for the OPD system in 2020 it is clear that a liberal arts education is a key requirement. Canada. Canadian Officership in the 21st Century Strategic Guidance for the CF Officer Corps and the OPD System, I-7 – I-8.

[105] Mackubin Thomas Owens, "Let's Not Rig Our War Games," Washington Post 29 Aug. 2002: A12.

[106] Van Creveld, 268-274.

[107] Henault, Lieutenant-General R.R., "Kosovo, The Military-Civilian Challenge and The General's Role," Horn, 287.

[108] Van Creveld, 268-274.

[109] Van Creveld, 75.

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