DEFENCE **R&D** **DÉFENSE**

Colloque S&T Symposium 2008

Undestanding the Human Dimension in 21st Century Conflict/Warfare: The Complexities of Human-with-Human Relationships
Comprendre la dimension humaine dans les conflits/ la conduite de la guerre au XXI siècle: Les complexités des relations interhumaine

Orrick White, DRDC Corporate
Peter Tikuisis, DRDC Toronto
Sofi Blazeski, DRDC Toronto

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Orrick White, DRDC Corporate
Peter Tikuisis, DRDC Toronto
Sofi Blazeski, DRDC Toronto

Defence R&D Canada – Corporate

Principal Author

Original signed by [Orrick White]

[Orrick White]

[Analyst, Office of the Chief Scientist]

Approved by

Original signed by Camille Boulet]

Camille Boulet]

[Chief Scientist, Office of the Chief Scientist]

Approved for release by

Original signed by [Camille Boulet]

[Camille Boulet]

[Chief Scientist, Office of the Chief Scientist]

Abstract

The purpose of Defence S&T Symposium 2008 - part two of a three year series - was to further explore human-centric conflict issues. The 2007 Symposium challenged the S&T community to address these issues, which were captured within three conflict domains: *Person-versus-Person*, *Person-versus-Nature*, and *Person-versus-Self*. For 2008, the domain of *Person-with-Person Partnership* that focuses on a holistic approach to conflict resolution was added.

Defence S&T Symposium 2008 'peeled back the onion' and presented leading research that is beginning to resolve human-centric issues in the new and future security environment. Canada and the Canadian Forces have an unfamiliar adversary in a battlespace largely governed by ideology. There is an urgent requirement to improve the preparedness and protection of our frontline combatants, and we need an actionable understanding of the multi-organizational response to conflict. These three challenges define the key themes for this Symposium.

Theme 1: Adversarial Intent

Panellists explored the notion that the post Cold War era has seen a significant rise in transnational violence directed against Western interests. The provision of safe havens for terrorists in failed and failing states and the promulgation of extremist messaging via mass media, characterize some of the current challenges. Further, the media's immediate and microscopic coverage of unintended actions (e.g., collateral damage) disproportionately undo great deeds in a 'Hearts and Minds' campaign. A successful strategic response compels us to understand the adversary and their environment. This strategy must not only anticipate the adversary, it must influence their intent. The art of influence has evolved over millennia; the science of influence could take us much further. Devising a strategy in the ideological battlespace obliges us to look inward to understand ourselves and our intentions in relation to our adversaries.

Theme 2: Understanding the 'Influence' Battlespace
Challenges discussed during this session were shaped around the acknowledgement that there is no more important resource in the profession of arms than the human. Yet, the challenge of recruiting, training, and retaining a professional military is accentuated due to multiple demands. Today's military professionals must adapt and perform with multi-functional skills (i.e., from negotiator to applicator of lethal force), in multi-dimensional roles (e.g., 3 block war), and under multiple environmental stressors (both physical and psychological). This challenge is compounded by ensuring moral and ethical decision-making in the face of atrocities and cowardly behaviour (e.g., use of humans as shields). The military professional must not only be agile and resilient, but continue to be objectively and emotionally battlespace-mature.

Theme 3: Human Complexity
"*It's an illusion to think that there is a military solution for Afghanistan.*" This remark exemplifies the need for a non-hierarchical 'whole of government approach' and the increasing reliance on multi-national efforts in response to foreign conflicts. While collaborative efforts promote legitimacy and efficiency, there are many obstacles to ensure effectiveness. Creating trust and encouraging decision-sharing among peers, superiors, coalition partners, target populations, other government departments, and non-government organizations is a key challenge. During the session many ideas and concepts emerged around the challenges posited above.

Any one of these thematic challenges seems daunting, but important advances have been made. The Defence S&T Symposium 2008 highlighted the state-of-the-art research in these areas with representation from defence and security, academia, and industry. The paradigm has shifted, and research in the new and future security environment is responding in kind. Conclusions that emerged over the course of the two days reinforced the fact that the battlespace has changed. No longer are military operations about winning the next high intensity battle; they are about establishing the conditions for self-sustaining stability. By working towards the development of models and concepts to better understand and influence the human in the battlespace, the S&T community should be well positioned to enable an agile and adaptive Canadian Forces.

Résumé

Le but du Colloque S & T pour la défense – deuxième d'une série se déroulant sur trois ans – a été d'explorer plus en détail les questions conflictuelles centrées sur l'humain. Le symposium de 2007 défiait la communauté S & T de répondre à ces questions, présentées dans trois domaines de conflits : conflits entre personnes, conflits entre la personne et la nature, conflits entre la personne et elle-même. Pour l'année 2008, on a ajouté un autre domaine, le partenariat entre personnes, qui se focalise sur une approche holistique du conflit.

Le Colloque S & T pour la défense 2008 a décortiqué le sujet et présenté des recherches de pointe qui commencent à résoudre les questions axées sur l'humain présentes dans l'environnement de sécurité. Le Canada et les Forces canadiennes ont un ennemi inhabituel dans un espace de bataille largement régi par l'idéologie. Un besoin urgent d'améliorer l'état de préparation et la protection de nos combattants de première ligne se fait sentir, et nous devons avoir une compréhension pratique de l'intervention multi-organisationnelle en cas de conflit. Ces trois défis définissent les thèmes principaux de ce colloque.

Thème 1 : L'intention de l'adversaire

Les panélistes ont étudié à fond le concept que l'après-guerre froide ait enregistré une augmentation notable de violence transnationale contre les intérêts occidentaux. Le fait que les états défaillants et en déroute donnent asile aux terroristes et que des messages extrémistes soient diffusés par les mass médias constituent certains des défis actuels. De plus, la couverture médiatique immédiate et finement détaillée d'actions non intentionnelles (p. ex., les dégâts collatéraux) annihile les bonnes actions d'une campagne de « cœur et d'esprit ». Une intervention stratégique réussie nous oblige à comprendre l'adversaire et son environnement. Cette stratégie ne doit non seulement anticiper l'adversaire, mais aussi influencer son intention. L'art d'influencer a évolué depuis des millénaires; la science de l'influence pourrait nous mener plus loin. Concevoir une stratégie dans l'espace de bataille nous oblige à voir en nous-mêmes afin de comprendre nous-mêmes et nos intentions à l'égard de nos adversaires.

Thème 2 : Comprendre l'influence de l'espace de bataille
Les défis qui ont fait l'objet de discussion pendant cette séance s'articulaient autour de la reconnaissance qu'il n'y a dans cette profession d'armes de ressource plus importante que l'humain. Mais, le problème posé par le recrutement, l'instruction et la conservation de militaires professionnels est aggravé par des demandes multiples. Le militaire professionnel moderne doit s'adapter et utiliser des compétences multifonctionnelles (c'est-à-dire, allant de celles d'un négociateur à celles d'un utilisateur de force létale), dans des rôles multidimensionnels (p. ex., la guerre à trois volets) et sous la pression de multiples facteurs stressants environnementaux (aussi bien physiques que psychologiques). Le défi est d'autant plus grave qu'il faut assurer des prises de décisions morales et éthiques face à des atrocités et des comportements lâches (par exemple, les boucliers humains). Le militaire professionnel ne doit pas seulement être agile et tenace, mais aussi continuer à faire preuve de maturité objective et affective dans l'espace de bataille.

Thème 3 : La complexité humaine

« Il est illusoire de croire en l'existence d'une solution militaire pour l'Afghanistan. » Cette remarque illustre le besoin d'une « approche pangouvernementale » non-hiérarchique et la dépendance de plus en plus grande envers les efforts multinationaux pour répondre aux conflits étrangers. Si les efforts de coopération favorisent la légitimité et l'efficience, de nombreux obstacles entravent l'atteinte de l'efficacité. Le principal enjeu consiste à stimuler la confiance et à encourager les décisions communes parmi les pairs, les supérieurs, les partenaires de coalition, les populations, les autres ministères et les organismes non gouvernementaux. Lors de la séance, un grand nombre d'idées et de concepts ont surgi autour des défis ci-dessus énoncés.

Chacun de ces défis semble intimidant, mais d'importants progrès ont été faits. Le Colloque S&T pour la défense 2008 a mis en exergue les recherches de pointe dans ces domaines grâce à des représentants de la défense et de la sécurité, des universités et de l'industrie. Le paradigme a changé, et les recherches dans le nouvel et futur environnement de sécurité renvoient l'ascenseur. Les conclusions dégagées au cours des deux jours ont renforcé le fait que l'espace de bataille a changé. Les opérations militaires ne consistent plus à gagner la bataille de haute intensité, elles visent plutôt à établir les conditions pour une stabilité autonome. En focalisant ses efforts sur l'élaboration de modèles et de concepts destinés à améliorer la compréhension et l'influence de l'humain dans l'espace de bataille, la communauté S & T devrait être bien placée pour rendre les Forces canadiennes agiles et adaptatives.

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Executive summary

Colloque S&T Symposium 2008: The Complexities of Human-with-Human Relationships

Orrick White DRDC Corporate TR 2008-004; Defence R&D Canada – Corporate; August 2008.

Approximately 200 participants took part in the Defence S&T Symposium 2008 held in Ottawa on 20-21 May. This was the eighth Symposium, and the second co-sponsored by the Chief of Forces Development, DND and DRDC. The purpose of Defence S&T Symposium 2008 - part two of a three year series - was to further explore human-centric conflict issues. The 2007 Symposium challenged the S&T community to address these issues, which were captured within three conflict domains: *Person-versus-Person*, *Person-versus-Nature*, and *Person-versus-Self*.

The opening remarks by the Symposium Moderator (DRDC Chief of Staff) reflected upon the past symposia and noted that this year the symposium came together to explore the human dimension of conflict and the complexities of human-with-human relationships.

This symposium was intended to 'peel back the onion' and present leading research that is beginning to resolve human-centric issues in the new and future security environment. The Canadian Forces have an unfamiliar adversary in a battlespace largely governed by ideology, thus we have an urgent requirement to improve the preparedness and protection of our frontline combatants. Moreover, an actionable understanding of the multi-organizational response to conflict is needed. In order to structure discussions, the Symposium was organized along the following three themes: Adversarial Intent; Understanding the 'Influence' Battlespace; and, Human Complexity.

The Chief of Force Development in the opening presentation on the Future Security Environment (FSE), addressed the emerging strategic capability planning processes and results for the CF. The FSE 2007-2030 is a strategic document whose purpose is to explore the future security environment, in order to provide those responsible for force development the necessary background, to ensure that the Canadian Forces can set and maintain a coherent force structure strategy for what lies ahead. He explained that the trends characterizing the future security environment fall into a wide variety of categories: geopolitical, economic and social, environmental and resource, science and technology, military and security. More than ever before the battlefield is complex; therefore, he stressed that the military must work with all existing and potential stakeholders to take on a more comprehensive, integrated and cooperative approach. In order to do so, the CF has developed an overarching strategic concept that is called the Integrated Capstone Concept.

In his follow-on presentation, ADM (S&T) discussed the associated S&T challenges in the future security environment. The two key challenges he raised included our ability, or lack thereof, to determine the next radical shock and how the community react to it. He also noted that the unpredictability (complexity) of human interactions requires an accelerated rhythm of S&T, so as to give the CF the necessary toolkit to operate effectively in the current battlespace.

The Adversarial Intent panel emphasized the need to be better able to understand our adversaries and their intent. However, intent is often very difficult to determine and, without knowing it, intent is very hard to defend against. Moreover, it is necessary to recognize that 'war amongst the people' is the current operational reality, terrorists will attack any weak link in the chain, so appropriate science and technology is essential for protective security. More emphasis on social science, intelligence capabilities and lessons learned need to be integrated into a soldier's professional development and training. Combating our adversaries will entail a comprehensive approach that goes well beyond the military.

The session on Understanding the 'Influence' Battlespace built upon the previous session's theme. Understanding that the battlespace is all about people is crucial, since "perception drives attitude and attitude drives behaviour". The CF presence in and actions on the battlespace influence the environment and the people around them, whether this influence is intentional or not. More and more, CF members are faced with moral and ethical decision-making in the field. Given this reality, finding a way in the planning process to predict higher-order effects is crucial. This would allow planners not only to avoid those higher-order unintended effects, but also to exploit potentially desired effects.

The last theme to be addressed was Human Complexity. As ADM (S&T) remarked at the outset, there is a difference between complicated and complex. When things are complicated, they can be broken down into pieces and be understood. However, when things are complex, they are neither predictable nor easily understood. Human behaviour is complex and the resultant interactions evade certainty of outcome. Our adversaries are adept at change and as our technological capabilities advance, so too do those of our adversaries. Panellists identified two factors currently working against our ability to defeat the adversary: 1) the unpredictability of the adversary; and, 2) the 'top-down' structure of military command which makes agility difficult.

ADM (S&T) and the CFD wrapped up the symposium noting that a rich set of ideas and concepts emerged during the two days. It has become clear that CF doctrine has changed, not just conceptually but in reality. War has become 'war amongst the people;' the end goal is not to win the last battle, but to establish the conditions for self-sustaining stability. The ability to influence has become as important as kinetic effects and, notably, science can enable this ability. The science and technology community must be part of the comprehensive approach that includes other government departments, non-governmental organizations and academia, in order to influence the system. Next year's symposium will continue to 'peel back the onion'. The challenge will be to move from theory to practice in order to operationalize the concepts that emerged from this year's Symposium. Ultimately the requirement will be to 'Enable the Frontline' which will be the focus of next year's Symposium.

Sommaire

Colloque S&T 2008: Les complexités des relations interhumaines

Orrick White ; DRDC Corporate TR 2008-004; Août 2008.

Quelque 200 personnes ont participé au Colloque S & T pour la défense 2008, qui a eu lieu à Ottawa les 20 et 21 mai. C'était le huitième colloque et le deuxième coparrainé par le Chef – Développement des forces, le MDN et RDDC. Le but du Colloque S & T pour la défense 2008, deuxième d'une série annuelle de trois, était d'étudier plus à fond les problèmes posés par les conflits axés sur l'humain. Le colloque de 2007 défiait la communauté S & T d'aborder ces problèmes, introduits dans trois domaines de conflits, soit les conflits entre personnes, les conflits entre la personne et la nature et les conflits entre la personne et elle-même.

Le discours d'ouverture du modérateur du colloque (le chef d'état-major de RDDC) a renvoyé aux colloques précédents et noté que cette année le colloque étudierait à fond les facteurs humains du conflit et les complexités des relations interhumaines.

Le colloque a été conçu pour décortiquer les thèmes et présenter les recherches qui commencent à résoudre les problèmes axés sur l'humain dans le nouvel et futur environnement de sécurité. Les Forces canadiennes font face à un adversaire inhabituel dans un espace de bataille régi en grande partie par l'idéologie, aussi devons-nous améliorer d'urgence l'état de préparation et la protection de nos combattants de première ligne. De plus, il nous faut avoir une compréhension pratique de la réponse multiorganisationnelle au conflit. Afin de structurer les discussions, le colloque a été organisé selon les trois thèmes suivants : l'intention de l'adversaire, comprendre l'influence de l'espace de bataille et la complexité humaine.

Le Chef – Développement des forces, dans la présentation préliminaire, qui portait sur l'Environnement de sécurité de l'avenir (ESA), traitait des processus de planification des nouvelles capacités stratégiques et de leurs résultats pour les FC. L'ESA 2007-2030 est un document stratégique qui vise à examiner l'environnement de sécurité de l'avenir afin de fournir aux responsables du développement des forces les éléments de base nécessaires pour s'assurer que les Forces canadiennes puissent élaborer et maintenir une stratégie de structure cohérente des forces pour faire face à l'avenir. Il a expliqué que l'environnement de sécurité de l'avenir était caractérisé par diverses catégories de tendances : géopolitiques, économiques et sociales, environnementales et de ressources, scientifiques et technologiques, militaires et de sécurité. L'espace de bataille n'a jamais été plus complexe. Le CDF a par conséquent souligné que le militaire devait travailler avec tous les intervenants actuels et potentiels, afin d'adopter une approche plus exhaustive, mieux intégrée et plus coopérative. Pour ce faire, les FC doivent élaborer un concept stratégique général appelé concept-cadre intégré.

Dans la présentation suivante, le SMA(S & T) abordait les défis S & T associés à l'environnement de sécurité de l'avenir. Les deux principaux défis qu'il a soulevés mettaient en jeu notre capacité ou notre incapacité de déterminer le prochain choc radical et la manière dont la communauté y réagit. Il a aussi mentionné que l'imprévisibilité (complexité) des interactions

humaines exigeait un rythme accéléré de S & T, afin de fournir aux FC la trousse à outils qui leur permettrait de bien fonctionner dans l'espace de bataille actuel.

Le groupe d'experts se penchant sur l'intention de l'adversaire a insisté sur le besoin de pouvoir mieux comprendre nos adversaires. Toutefois, l'intention est souvent très difficile à déterminer et, si on ne la connaît pas, se défendre contre elle n'est pas chose facile. De plus, il est nécessaire de reconnaître que « la guerre entre les gens » ("the war amongst the people") constitue la réalité opérationnelle courante. Les terroristes attaqueront tout maillon faible de la chaîne; des sciences et des technologies idoines sont par conséquent essentielles pour assurer la sûreté. Les sciences sociales, les services de renseignement et les leçons retenues doivent être intégrées de manière plus insistante dans le perfectionnement et la formation professionnels du soldat. Combattre nos adversaires nécessite une approche exhaustive qui va au-delà du militaire.

Le dernier thème traité était la complexité humaine. Comme le SMA(S & T) a noté au début, compliqué et complexe ne sont pas pareils. Une chose compliquée peut être fractionnée et peut être comprise. Une chose complexe n'est ni prévisible ni facile à comprendre. Le comportement humain est complexe et les interactions qui en résultent sont loin d'être évidentes. Nos adversaires sont experts au changement et leurs capacités technologiques progressent à mesure que les nôtres avancent. Les panélistes ont cerné deux facteurs qui entravaient notre capacité de vaincre l'adversaire : 1) l'imprévisibilité de l'adversaire et 2) la structure descendante du commandement militaire qui gêne l'agilité.

Le SMA(S & T) et le CDF ont conclu le colloque en notant que les deux journées ont généré une gamme d'idées et de concepts bien riches. Il s'avère que la doctrine des FC a changé, non pas de manière conceptuelle, mais de manière réelle. La guerre est devenue une guerre entre les gens, le but final n'étant pas de gagner la bataille, mais d'établir des conditions de stabilité autonome. La capacité d'influencer est devenue aussi importante que les effets cinétiques et la science et technologie peut servir à réaliser cette capacité. La communauté scientifique et technologique doit participer à l'approche exhaustive qui englobe les autres ministères, les organismes non gouvernementaux et les universités, afin d'influencer le système. Le colloque de l'année prochaine continuera de décortiquer le sujet. Le défi consistera à passer de la théorie à la pratique, afin d'opérationnaliser les concepts nés du colloque de cette année. Il faudra finalement « habiliter la première ligne », et ce sera l'objet principal du colloque de l'année prochaine.

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Acknowledgements

Introduction

Last year's Defence S&T Symposium 2007 acknowledged that in the 21st century the battle space has changed. Warfare is not solely about mastering technological systems it is about people and their relationships. The symposium examined the change in the battle space and explored the challenges of human conflict along three dimensions: person-vs.-person, person-vs.-nature, and person-vs-self. This set the stage for this year's Symposium (second of a three-year series that focuses on the human-centric nature of conflict) to "peel back the onion" and highlight leading research efforts that address the challenges in the Future Security Environment. In recognition of the importance that a comprehensive approach be taken, the complexity of Human-with-Human Relationships was the focus of this year's overarching theme of Human Complexity in the 21st Century. The Symposium's sub-themes were: The Future Security Environment in the 21st Century; the Science and Technology (S&T) Challenges of 21st Century Conflict; Adversarial Intent; Understanding the 'Influence' Battle Space; and, Human Complexity.

Current and future CF challenges were addressed within each theme, in addition to the rich set of concepts and theories that are emerging and called for, and the integration of these efforts to achieve a viable comprehensive approach. This Symposium further challenged the scientific community to anticipate the unexpected and to provide proactive solutions. It set the stage for next year's Symposium that will focus on "Taking Care of the Front Line".

The following synopsis seeks to capture the overall themes that emerged during the two day Defence symposium. At the outset, three challenges were identified that defined the themes for the *'The Human in Conflicts S&T Symposium Series*.' These challenges included: 1) an

unfamiliar adversary in a battlespace largely governed by ideology; 2) an urgent requirement to improve the preparedness and protection of our frontline combatants; and, 3) the need for actionable understanding of the multi-organizational response to conflict. The complexities of Human-with-Human relationships is a paradigm shift largely governed by ideology. It is within this framework that the 2008 S&T symposium was presented.

The Future Security Environment and the S&T Challenges in the 21st Century

The symposium was co-chaired by the Chief of Force Development (CFD) MGen Mike Ward and the Assistant Deputy Minister, Science and Technology (ADM S&T) Robert Walker. In their opening presentations on the Future Security Environment (FSE)[1] and the S&T Challenges of 21st Century Conflict, Dr Walker examined how the future is unknown and difficult to predict in large part because of the inherent uncertainty (complexity) of human interactions. To address the challenges that will arise in the future security environment, he posited two penetrating questions for discussion: "What is the next shock (e.g., the next 9/11) that is going to radically change our life, environment, and our ability to move forward?" and "How will the world react?" The consequences of the shocks are driven by the interconnectedness at many levels throughout the world: nations; groups; and, even individuals. The science that must be conducted will need to provide future field commanders with the appropriate tool sets to respond to the unpredictable shock(s). This science cannot be conducted in isolation and must involve CF collaboration with the S&T community to build resilience and adaptiveness into CF capabilities, in addition to developing concepts that are tactile and tangible to shape CF doctrine for the FSE.[2] Both Dr Walker and MGen Ward agreed that the FSE can no longer be thought of as linear. There are many complex factors interacting in a combination of ways that make the future difficult to

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[1] The FSE 2007-2030 is a strategic document written by the Chief of Force Development. Its purpose is to explore the future security environment in order to provide those responsible for force development the necessary background to ensure that the Canadian Forces can set and maintain a coherent force structure strategy for what lies ahead. The trends characterizing the future security environment fall into a wide variety of categories: geopolitical, economic and social, environmental and resource, science and technology, military and security.

[2] Most of the symposium presentations suggested that the current/future battlespace for the CF is typified by the type of conflict being experienced in Afghanistan. This is generally the accepted view for the type of conflict that the CF would be expected to engage in internationally. However, in the domestic and continental context, this is not indicative of the anticipated CF roles.

predict. Technological solutions were sought in the past, but "Technology is only part of the solution." The human dimensions (character, culture, disease, migration, population imbalance), economic and social factors, environmental and resource trends, science and technology trends, and military and security trends all need to be considered. Every aspect that is explored must be viewed through a lens that considers the impact to the human, and vice-versa. Therefore, it is not enough to think about the adversary's intent, Canadians in theatre must also be clear of their own intent.

MGen Ward stressed that the military must work with all existing and potential stakeholders to explore how all combinations of factors interact in order to assess, in the defence context, their current and future capabilities. This will inform capability-based planning so that it can be built upon and strengthened, especially when timelines shorten, to ensure that adequate training is provided to CF members and the best possible recommendations are given to senior leaders. The evolving complexity of the FSE will require the CF to take on a more comprehensive, integrated, and cooperative approach that is networked with all disciplines of knowledge, be they governmental, non-governmental, scientific, or academic. To accomplish this, the CF leadership has developed the Integrated Capstone Concept (ICC)[3] that goes beyond the 3D (defence, development and diplomacy) and Whole of Government approaches, and is intended to ensure that every capability option has been considered before moving forward. In the end he stressed

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[3] The Integrated Capstone Concept is an overarching high-level conceptual document aimed at informing all the other unifying concepts about the direction DND/CF should take in the development and sustainment of its capabilities for the next fifteen years ahead. The evolving complexity in terms of the number of new problem sets and also the number of intervening actors demands a comprehensive, integrated cooperation between defence and security partners, adaptiveness at the individual and organizational levels, and a networked focus in the application of the national intent. Networked refers to more that just technology, it included military, political, economic, cultural, organizational and social networks.

that, "Complexity demands a comprehensive integrated, adaptive and networked focus in the application of national intent."

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Ingar Moen Memorial Lecture:[4]

Recipient: LGen Mike L. Jeffrey (Ret.)

The recipient of the 2008 Ingar Moen Memorial Lecture was LGen Mike Jeffery. His presentation was entitled, "Human Centric Conflict." The foundation of LGen Jeffrey's talk was that all conflict is human and thus begins with an individual at the centre of the conflict dynamic. A better understanding of the individual must therefore take place to deconstruct the conflict environment. For instance, what are the key drivers that motivate an individual's actions in that conflict environment? Maslow's hierarchy of needs provides a good starting point but when humans are faced with conflict, they are driven by three hierarchical factors: survival needs; values and beliefs; and, group loyalty, as depicted in the diagram below.

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[4] In June 2006, friends and colleagues both in Canada and internationally, were saddened by the passing of Ingar Moen, one of DRDC's most influential scientists. In the corporate office, Dr. Moen was the key driver of the S&T Policy directorate; he was the original thought that drove the first and future S&T Symposia since 2000. He chaired the Disruptive Technology Working Group that has become the generator of ideas for many areas of science policy in the Agency, including the annual symposium. Ingar was key to the development of many strategic documents and activities including the Technology Investment Strategy (TIS) and *"Looking Forward, Staying Ahead"*. At the Defence S&T Symposium 2007 the first S&T Symposium keynote lecture was dedicated to Ingar's memory/legacy. It was determined to make this an annual award entitled the 'Ingar Moen Memorial Lecture.'

When an individual's survival is in question, he/she will often subordinate their other needs until the threat to their survival has been removed. Once removed, the other factors become dominant in shaping behaviour. Values and beliefs are the essence of culture, and an individual is naturally drawn to other people sharing similar values and beliefs; especially in a conflict environment. Joining a group enhances an individual's survival, and confirms one's beliefs and values, which in turn reinforces a person's loyalty to the group. A cooperative relationship, based on mutual beliefs, will then likely develop. Yet, if an individual loses connectivity with the group because of diminishing survival security and/or diverging values and beliefs, loyalty to the group is likely to suffer and the individual may seek different group membership.

LGen Jeffery went on to ask what the framework for understanding adversarial intent meant for the Canadian Forces and the S&T community. He suggested that is means the following: We must have a clear recognition of what motivates others and what this means for group cohesion. We also have to understand relationships within the group and how they will respond. Lastly, we have to determine how to compare factors that guide group cohesion or lack thereof.

The question that arises, therefore, is whether the scientific community can determine how these needs interact to influence an individual, the members of a group, and their actions. One of the audience members commented that ideas cannot be fought with bullets; we need bullets to fight bullets, but we need ideas to fight ideas. How then can the CF use social science knowledge from the scientific community to influence individuals in a group and actions? Ideally, a framework needs to be developed to apply such knowledge in order to predict how the various actors in the conflict environment (belligerents, neutrals, allies) perceive and react to CF presence. This will

help provide commanding officers with the most effective ways of implementing a comprehensive approach.

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Session: Adversarial Intent

"The enemy advances, we retreat; the enemy camps, we harass; the enemy retreats, we

pursue."   *Mao Tse-tung*

The provision of safe havens for terrorists in failed and failing states, and the promulgation of extremist messaging via mass media characterize some of the current challenges. Further, the media's immediate and microscopic coverage of unintended actions (e.g., collateral damage) disproportionately undo great deeds in a 'Hearts and Minds' campaign. A successful strategic response compels us to understand the adversary and their environment. This strategy must not only anticipate the adversary, it must influence their intent. The art of influence has evolved over millennia; the science of influence could take us much further. Devising a strategy in the ideological battlespace obliges us to look inward to understand ourselves and our intentions in relation to our adversaries.

Panel Members:

Session Chair: Dr. James Moore, DRDC Toronto

Panellists:

       Keynote Speaker: Dr. Martin Rudner, Research Chair Emeritus, Carleton University

       BGen David A. Fraser, Commandant, Canadian Forces College, DND

       Carol McCann, DRDC Toronto

       Dr. Walter Dorn, Canadian Forces College, Toronto

       Dr. Laure Paquette, Associate Professor, Lakehead University

During the introduction of the adversarial intent panel, MGen Ward set the stage for the panel by emphasizing that a wide area of study will have to be undertaken to understand and address adversarial intent. The Future Security Environment involves new operations, combinations of operations, and new actors. During the Cold War the enemy was predictable but this has now changed and the CF needs doctrine that can address change at the tactical, operational and

strategic levels. 'The adversary ain't what it used to be', captures this notion very well. He went on to say that at the core of the Comprehensive Approach lies an effects based approach to operations (EBAO). This means that there is a need for both quantitative and qualitative analysis because attrition models do not work in the current operational environment.

Dr Martin Rudner opened the panel with his keynote talk entitled, "Inter-Terrorism in Asia: Trends, Targets and Objectives." His key message was that we need to understand our adversaries and develop cultural sensitivities. He cautioned that terrorist will attack any weak links in the chain and the members of the cadre are highly educated with advanced degrees in computer science, medicine and engineering as well as philosophy and literature. He went on to argue that the development of science and technology which can address the complexities of adversarial intent is highly necessary to address the challenges, but, technology is not the only tool.

The panel members agreed that the world has witnessed a cultural shift in conflict since the Cold War. The Cold War was characterized by a well-defined enemy whose intent was well-understood, which allowed the CF and its allies to prepare for a conflict whereby manoeuvre was largely predictable. As a result, research efforts and CF training focused on kinetic, technological, and engineering solutions to provide the forces with tactical, operational, and strategic advantage. Research involving the social sciences for intelligence and influence operations in the field was secondary. The paradigm has reversed and now the social sciences are recognized as key to ensuring success in the FSE.

The CF has and will continue to interact with multiple actors, many of whom are non-state, with various motivated intentions and grievances that will challenge the CF's ability to identify and

respond to adversaries. As BGen Fraser said, understanding human geography and the adversary's worldview must be part of the solution. Identifying the adversary's grievances, be they religious, political, fanatical, economic or other must also be part of CF training in order to fully appreciate and understand the battle space so that appropriate influence operations can be implemented to counter the adversary's intent.

This view was expanded upon by one panellist who stated that the battlespace is about people, and not only those that the CF has been tasked to fight and help, but also Canadians back home. It is important then to understand and apply the nation's intent through a comprehensive approach that includes the CF to deliver the desired effect in theatre and back at home. The role of the front-line soldier has consequently become much more complex, where tactical decisions can have strategic implications. This raises the question of not whether, but how the human dimension can be incorporated into existing CF doctrine to prepare soldiers for interaction with adversaries having an asymmetrical advantage.

The panel members agreed that a greater emphasis on the social sciences, intelligence capabilities, and lessons learned needed to be incorporated into a soldier's professional military education and to be considered at the beginning of the operations planning process. Several theories and models were discussed by the panel members in the context of adversarial intent including Just War Theory, Underdog Theory, Reasoned Action Approach, and Command Based Models. Certain of these and others are part of the expanding social sciences curriculum at academic defence institutions such as the Canadian Forces Staff College and the Royal Military College.

One panellist stressed the importance of reviewing past conflict terminology. The panellist explained that many of these historical terms had roots in kinetic force and effect that can have quite different meanings today. For instance, an adversary was defined as a person and/or group with the potential to use kinetic force. Today's adversary can achieve considerable effect via non-kinetic means (e.g., use of the Internet to promulgate hostile intent). As force can take on many forms be they physical, virtual, cyber, and even perceptual, so can adversaries change over time from hostile to neutral to allied.

A comprehensive approach is essential to succeed in the FSE characterized by the dynamism described above. The comprehensive approach can be facilitated by creating a common understanding of language amongst partners. It would also benefit from a more diverse incorporation of social sciences (e.g., anthropology) and partners (e.g., think tanks, academics and UN expertise).

Session: Understanding the "Influence" Battlespace

There is no more important resource in the profession of arms than the human. Yet, the challenge of recruiting, training, and retaining a professional military is accentuated due to multiple demands. Today's military professionals must adapt and perform with multi-functional skills (i.e., from negotiator to applicator of lethal force), in multi-dimensional roles (e.g., 3 block war), and under multiple environmental stressors (both physical and psychological). This challenge is compounded by ensuring moral and ethical decision-making in the face of atrocities and cowardly behaviour (e.g., use of humans as shields). The military professional must not only be agile and resilient, but continue to be objectively and emotionally battlespace-mature.

Panellists:

Session Chair: Catherine Campbell, Director Military Personnel Operational Research and Analysis, Section Head, DND

Panellists:

        Keynote Speaker: MGen Stuart. A. Beare, Chief of Force Development

        Keith Stewart, DRDC Toronto

        Dr. Megan Thompson, DRDC Toronto

        Dr. Gregory, Professor, University of British Columbia and Cambridge University

MGen Beare set the context for the panel "Understanding the Influence Battlespace". He pointed out that today the battlespace is all about people, "Perception drives attitude, attitude drives behaviour." In the case of 'war amongst the people', influencing perception and attitude in the battlefield is key and this will require a whole of government approach. In keeping with this, Keith Stewart pointed out that, "… the 'target' is the mind(s) of the relevant individual or group; therefore, psychological and physical effects should be integrated during the planning process."

Since the Cold War, moral and ethical dialogue has become more acceptable and common practice in CF culture. Indeed, the CF has recognized the need to change training doctrine to ensure that the social sciences and non-kinetic operations are incorporated into the training mix of

the Rules of Engagement (ROE). To meet the challenge of "making the extraordinary, ordinary", the military needs to place a greater emphasis on improving its human intelligence/surveillance capabilities. For example, a better understanding of human geography, and of the enduring perceptions and attitudes that drive behaviour are training elements that will empower CF members on the ground. Developing non-intermediated communication skills with locals is also recognized as valuable training.

Asymmetric threats in the new conflict environment are particularly challenging to CF members faced with moral and ethical challenges in theatre. Training in moral and ethical decision making is currently taught at Gagetown and Wainwright CFB, and at the Canadian Forces College (Toronto), where much of the doctrine is simulation and lecture based. A valid concern is whether this adequately prepares CF members to confidently make the right decision when faced with an asymmetric threat, that is, when the Rules of Engagement (ROE) might not necessarily reflect the reality on the ground. Furthermore, what is the impact on the individual that experiences trauma during engagement and what are the resources available to help that individual reconcile strained decision making? One panellist suggested that group discussion and integrated field training before deployment were valuable preparatory options. Another panellist agreed that dialogue needed to occur amongst all soldiers, regardless of rank. In essence, greater emphasis during training needs to be placed on mental rehearsal, open communication (e.g., story telling, dissecting experiences), and human-centric lessons learned.

Every action has a reaction. The CF's presence and actions in the battlespace influence the environment and the people around them, whether intended or not. This can be especially problematic if the second-and-third order effects from these actions were overlooked or

unforeseen in the planning process. Hence, finding a way in the planning process to predict these

higher order effects is crucial, which would allow planners not only to avoid unintended effects,

but also to exploit potentially desired effects to operational advantage. Various methodologies

were proposed including probability state modeling of event evolution, post-hoc analysis of event

deconstruction, and influence reconstruction.

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Session: Human Complexity

"It's an illusion to think that there is a military solution for Afghanistan." This remark exemplifies the need for a non-hierarchical 'whole of government approach' and the increasing reliance on multi-national efforts in response to foreign conflicts. While collaborative efforts promote legitimacy and efficiency, there are many obstacles to ensuring effectiveness. Creating trust and encouraging decision-sharing among peers, superiors, coalition partners, target populations, other government departments, and non-government organizations is a key challenge.

Session Chair: Dr. Jacques Lavigne, Director S&T Human Performance, DRDC

Keynote Speaker: MGen Vincent Déportes, Général de division, l'Armée de Terre de France

Panellists:

       John Verdon/LCdr Bruce Fraser, Chief of Military Personnel

       Dr. Phil Farrell, Defence Science Support Team, DRDC Ottawa

       Paul Comeau, DRDC-CORA, Director S&T Integrated Capabilities and Personnel, DND

Keynote speaker, General Vincent Desportes, (French Army) set the stage for the panel on Human Complexity in his talk about conflicts, new tasks and new soldiers. Given the new operational environment, the general suggested that we need to rethink our view of warfare. He noted that, "The forms of war have fundamentally changed and the role and necessary form of the military have changed with them." He argued that increasingly the ground environment (where the population resides) is, and will be in the future, the centre of gravity. In this context, he argued that technology superiority is not an end in itself and it cannot be sufficient, in and of itself, to solve the problem of war. Moreover, he suggested that we must rethink our relationship with technology because technology in and of itself has only rarely decided the outcome of a confrontation – it is only one dimension of conflict. To deal with the various aspects of conflict requires all dimensions of political actions including the ability of operate across all spectrums of conflict and to pay close attention to lessons learned in the field.

Following MGen Desportes's presentation, the panel went on to acknowledge that in order to respond to the complex demands that are upon military operations today, and which will be faced in the future, a broadened approach must be considered that incorporates all of the dimensions of military actions, while considering all of the resources available to the adversarial community.

Human complexity entails uncertainty and no matter how well-prepared one is or how well-understood one's adversary is, human behaviour is complex and the resultant interaction amongst humans evades certainty of outcome. Two factors currently working against defeating the adversary are its unpredictability and the 'top-down' structure of military command that makes it difficult to react with agility when faced with uncertainty. The military needs to find ways to work across these hierarchical levels to react quickly, but flexibly, to changing circumstances while keeping as many people as necessary, adequately informed and in-the-loop. Given the emergence of the whole of government approach, it is also essential that quicker and easier communications be established to ensure the success of a comprehensive approach. Establishing effective modes of communication as well as the rules, regulations and policies between and among organizations will be the challenge.

Adversaries are also adept at change and they have embraced communications technology to their advantage. For example, their use of the Internet to distribute information and to recruit new members has allowed them to network as strongly or loosely as required, or to re-configure into smaller entities if necessary. One panellist suggested that this use of Internet technology has brought the battlespace into the home front. It has also introduced the notion of 'the death of distance' and changed the time restraints for taking action. Changes to military doctrine have been initiated to respond to this new reality. These changes are aimed at developing inter-force

synergies, improving participation in multinational operations, and advancing forms of information technologies. However, as our technological capabilities advance, so too do those of the adversary. Infiltration of the adversary's communication capabilities remains key to mission success.

Another panellist suggested that the military needs to fine-tune its procedures and incorporate the digital environment and associated technologies into CF doctrine. Social networks in a non-hierarchical social environment have done this successfully. Could this be built into a military context under the concept of 'Responsible Autonomy', which begs the question "can this be done without having someone in charge"? The belief is that responsible autonomy comes with accountability since everything in the digital world is recordable and thus transparent. Yet another panellist commented that everything does not necessarily get recorded on the Internet, and hence accountability is not assured. However, a sense of responsibility develops once relationships are established. Ultimately, the former panellist rebutted that there were two positive dimensions to transparency via electronic networking: 1) it brings accountability, which reinforces the internalizing of professionalism, and 2) it facilitates an agile response. Responsible autonomy in a non-hierarchical military network should work because CF personnel believe in service before self and work for altruistic ends, which reflect the essence of internalized Canadian values and military professionalism.

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Conclusion:

Base upon the panels, presentations and discussions over the two day event, several broad conclusions were gleaned. The battlespace is no longer about winning the next high intensity conflict; it is about establishing the conditions for self-sustaining stability. Military operations in the FSE will have to incorporate the human centric aspects of war to successfully empower the front line to dominate and influence human geography. Although doctrine has been slow to change, Canadian military leaders have acknowledged this change in the battle space and are preparing the forces by stressing the importance of relationships and integrating lessons learned.

"A new idea can take up to 15 years to work through the military system." is how Dr. Walker expressed the evolution of a capability. So how can science and technology continuously progress and be accomplished faster to ensure our forces are prepared for the FSE? The Defence S&T Symposium signalled the way ahead with the need for an agile comprehensive approach. The recommendations that came out of the three thematic sections were: 1) the CF must become more agile and adaptive in its response to the evolving battle space; 2) a rich set of emerging concepts and theories is developing that can enable this change; and 3) the S&T community must be part of the comprehensive approach.

The post Cold War has witnessed a shift away from the use of distant kinetic force and the shift towards the close war among the people. The current and FSE battle space is about people and establishing the conditions for self sustaining stability. To understand the human is to have enormous opportunity to influence behaviour and to ideally achieve desired effects without actually exercising explicit power. By working towards the development of models and concepts

to better understand and influence the human in the battle space, the S&T community will be well placed to enable an agile and adaptive CF. However, this effort cannot be accomplished independently. The scientific community has been called upon to collaborate with other government departments, non-state actors and other nations to establish technological means to facilitate the comprehensive approach.

Among the rich set of concepts and theories discussed at this year's symposium is the suggestion that 'it is not enough to think about what the adversaries intent is; we need to be clear on what is our intent is'. To do so would provide a perspective for truly understanding and successfully influencing the adversary. The CF must not view the adversary through a one-way lens but rather consider how its actions will impact and influence his behaviour. The importance of understanding the adversaries' intent underlines how the CF devises, develops and executes influence operations.

Time horizons have shortened. Operational tempo is such that the CF is often in unchartered territory and its operations sometimes become experimental. There is a need to accelerate the rhythm of S & T, to develop and provide more actionable concepts, models and theories so that they can be exploited by the CF on the ground without delay. The commitment of the 'system' to actually exploit results is a great challenge. As Dr. Walker emphasized, the challenge is not generating the next bright idea and engineering it for use, but rather the commitment of the system to exploit that idea. Open and clear communication must be established between all stakeholders to continuously progress and communicate concerns in order to positively make a difference to empower our soldiers on the front lines.

The Way Ahead: Taking Care of the Frontline – "Mission Success in the Human Terrain"

The Defence S&T Symposium 2009 will continue to focus on the human dimension of conflict and explore ways to operationalize the rich set of concepts and theories identified in this year's symposium. To truly make a difference for the CF in the FSE, the following two themes will be explored further: 1) empowerment of the front lines; and, 2) realizing the comprehensive approach through an adaptive military and government.

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Annex A   Relevant Strategic DND Documents

Future Security Environment (FSE) – Part I, 2008, Chief of Force Development, DND
Strategic Capability Road Map (SCR) Version I – Draft – July 2008 - Chief of Force Development, DND

Objective Force 2028, July 2008, Chief of Force Development, DND

Defence S&T Strategy, Science and Technology for a Secure Canada, Released: December 2006, ISBN: D2-186/2006, 978-0-662-49705-9, NDID: A-JS-007-000/AF-004, Art Direction by ADM(PA) DPAPS • CS06 0378. Available at: www.drdc-rddc.gc.ca/st**strategy**/intro_e.asp

Canada First Defence Strategy. Available at: www.forces.gc.ca/site/focus/**first**/defstra_e.asp

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Annex B   Further Reading Suggested by Presenters

For participants who are interested in further reading material related to the Symposium themes, several presenters have provided their recommendations which are listed below.

Derek Gregory – Session: Understanding the "Influence" Battlespace

Book:

The colonial present: Afghanistan, Palestine and Iraq (Oxford: Blackwell, 2004)

Articles:

'**The rush to the intimate: counterinsurgency and the cultural turn in late modern war**', Radical philosophy 150 (2008) pp. 8-23.

'**The Biopolitics of Baghdad: Counterinsurgency and the counter-city**', Human Geography 1 (2008) pp. 6-27.

'**Vanishing points: Law, violence and exception in the global war prison**', in Derek Gregory and Allan Pred (eds) Violent geographies: fear, terror and political violence (New York: Routledge, 2007) pp. 205-236.

'"**In another time zone, the bombs fall unsafely**": Targets, civilians and late modern war', Arab World Geographer 9 (2) (2006) pp. 88-111 [published 2007]

John Verdon – Session: Human Complexity

Papers:

Web 2.0 and ADL. ADL Newsletter for Educators and Educational Researchers. Academic ADL Co-Lab press. June 2008. http://www.ymlp28.com/pubarchive_show_message.php?adlnews+25 Forrester, B. (2008).

Learning Journals as an Instructional and Self-Assessment Tool for Epistemological Growth in Online Learning **Canadian Journal of Learning and Technology - Special Issue on KnowledgeBuilding**. Brett, C., Forrester, B., & Fujita, N. (in press).

Introducing Peer Production into the Department of Defense. **Proceedings of E-Learn 2007 World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education**. Forrester, B., & Verdon, J. (2007).

Transformation in the CF: Understanding the Impact of Network Technologies on the Design of Work – Social and Peer Production.   Directorate of Military Personnel Force Development Technical Memorandum DMPFD TM 2007-04 April 2007. Verdon, J., Forrester, B., & Tanner, L. (2007).

An Exploration of Epistemological Understanding and Participation in Online Knowledge Building Communities. PhD Dissertation located in OISE/UT Library. Verdon, J., Forrester, B., & Tanner, L. (2007).

The Knowledge Challenge. To be published in the Delta Info: Training Development Branch Newsletter. Forrester, B. (In Press). Forrester, B. (In Press).

On improving School Feedback. Delta Info: Training Development Branch Newsletter, Winter 2003-2004 Volume 7, no. 1. Forrester, B. (2004).

Walter Dorn – Session: Adversarial Intent

Papers:

"**Justifications for War in the Scriptures of Seven World Religions**", Defence Research and Development Canada, *Defence Research Report* (under preparation).

"**U Thant: Buddhism in Action**", in Kille, Kent (ed.), The UN Secretary-General and Moral Authority: Ethics and Religion in International Leadership, Georgetown University Press, Washington, DC, 2007, pp.143-186. Available online at www.walterdorn.org/publications/UThant_BuddhismInAction.pdf.

"**The United Nations as a Spiritual Institution**", *Interreligious Insight*, Vol. 3, No. 2 (April 2005), pp.30-37. Available online at www.interreligiousinsight.org/April 2005/April05Dorn.html.

"**World Order for a New Millennium: Political, Cultural and Spiritual Approaches to Building Peace**," A. Walter Dorn (ed.), St. Martin's Press, New York, and Macmillan Press, London, 1999, 288 pp.

Megan Thomas – Session:

"**References for Moral and Ethical Decision Making in Operations Project: Moral and Ethical Decision-Making - A Review.**" DRDC Contract Report CR 2005-246. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Ann-Renee Blais). Ancker, J.S., & Weber, E.U. (2005).

"**Resolving Ethical Dilemmas: Exploring the Role of Moral Principles.**" DRDC Technical Report TR 2008-099. Defence R&D Canada: Toronto. Blais, A-R. & Thompson, M.M. (2007).

"**Taboo or tragic: Effect of Tradeoff Type on Moral Choice, Conflict, and Confidence. Mind & Society.**" doi:10.1007/s11299-007-0037-3 Mandel, D. R., & Vartanian, O. (in press).

"**Moral and Ethical Decision Making in a Realistic Field Training Scenario.**" DRDC Contract Report CR 2007-012. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. David Mandel). Thomson, M. H., & Adams, B.D. (2007).

"**The Impact of Moral Exemplar Training on Moral Judgment and Decision-Making in an Operational Context.**" DRDC Contract Report CR 2008-107. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Ann-Renee Blais). Thomson, M. H., Adams, B.D., Tario, C. D., & Brown, A.L. (2008).

"**Collaborative Team Decision-Making in a Realistic CF Training Scenario.**" DRDC Contract Report CR 2008-098. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Megan Thompson). Thomson, M. H., Adams, B.D., Tario, C. D., & Brown, A.L. (2008).

"**The Impact of Culture on Moral and Ethical Decision-Making: An Integrative Literature Review.**" DRDC Contract Report CR 2007-168. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Megan Thompson). Thomson, M. H., Adams, B.D., Taylor, T.E., & Sartori, J.A. (2007).

"**Moral and Ethical Decision Making in Canadian Forces Operations.**" DRDC Contract Report CR 2006-013. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Joseph Baranski). Thomson, M. H., Adams, B.D., & Sartori, J.A. (2006).

"**Moral and Ethical Decision Making Literature Review.**" DRDC Contract Report CR 2005-105. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Joseph Baranski). Thomson, M. H., Adams, B.D., & Sartori, J.A. (2005).

"**The Impact of Emotion on Negotiation Behaviour During a Realistic Training Scenario.**" DRDC Contract Report CR 2007-166. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Matthew Duncan). Thomson, M. H., Adams, & Waldherr, S. (2007).

"**CF Training for Moral and Ethical Decision Making in an Operational Context.**" DRDC Contract Report CR 2006-216. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Megan Thompson & Dr. Joseph Baranski). Thomson, M. H., Lee, K.L.K., & Adams, B.D. (2006).

"**Impetus to action: Moral and ethical decision making in Canadian Forces operations.**" In Emily J. Spencer and Daniel Lagacé –Roy (Eds.) Ethical decision-making in the new security environment., Canadian Forces Leadership Institute, Kingston ON, Canada. Thomson, M.H., Adams, B.D., Thompson, M.M., Baranski, J.V. (in press).

"**Moral and Ethical Decision Making.**" DRDC Contract Report CR 2007-087. Defence R&D Canada: Toronto. (DRDC Scientific Authority: Dr. Ann-Renee Blais).
"**Research in Moral and Ethical Judgement: A Methodological Review.**" DRDC Technical Report TR 2003-136. Defence R&D Canada: Toronto. Weber, E.U. (2007). Young, S. B., & Baranski, J.V. (2003).

List of symbols/abbreviations/acronyms/initialisms

3D	Defence, Diplomacy, and Development
ADM	Assistance Deputy Minister
CF	Canadian Forces
CFB	Canadian Forces Base
CFD	Chief of Force Development
DRDC	Defence Research and Development
DND	Department of National Defence
EBAO	Effects Based Approach to Operations
FSE	Future Security Environment
ICC	Integrated Capstone Concept
NRC	National Research Council
ROE	Rules of Engagement
SCR	Strategic Capability Roadmap
S&T	Science and Technology
TIS	Technology Investment Strategy
UN	United Nations

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The purpose of Defence S&T Symposium 2008 - part two of a three year series - was to further explore human-centric conflict issues. The 2007 Symposium challenged the S&T community to address these issues, which were captured within three conflict domains: Person-versus-Person, Person-versus-Nature, and Person-versus-Self. For 2008, the domain of Person-with-Person Partnership that focuses on a holistic approach to conflict resolution was added.

Defence S&T Symposium 2008 'peeled back the onion' and presented leading research that is beginning to resolve human-centric issues in the new and future security environment. Canada and the Canadian Forces have an unfamiliar adversary in a battlespace largely governed by ideology. There is an urgent requirement to improve the preparedness and protection of our frontline combatants, and we need an actionable understanding of the multi-organizational response to conflict. These three challenges define the key themes for this Symposium.

Theme 1: Adversarial Intent

Panellists explored the notion that the post Cold War era has seen a significant rise in transnational violence directed against Western interests. The provision of safe havens for terrorists in failed and failing states and the promulgation of extremist messaging via mass media, characterize some of the current challenges. Further, the media's immediate and microscopic coverage of unintended actions (e.g., collateral damage) disproportionately undo great deeds in a 'Hearts and Minds' campaign. A successful strategic response compels us to understand the adversary and their environment. This strategy must not only anticipate the adversary, it must influence their intent. The art of influence has evolved over millennia; the science of influence could take us much further. Devising a strategy in the ideological battlespace obliges us to look inward to understand ourselves and our intentions in relation to our adversaries.

Theme 2: Understanding the 'Influence' Battlespace

Challenges discussed during this session were shaped around the acknowledgement that there is no more important resource in the profession of arms than the human. Yet, the challenge of recruiting, training, and retaining a professional military is accentuated due to multiple demands. Today's military professionals must adapt and perform with multi-functional skills (i.e., from negotiator to applicator of lethal force), in multi-dimensional roles (e.g., 3 block war), and under multiple environmental stressors (both physical and psychological). This challenge is compounded by ensuring moral and ethical decision-making in the face of atrocities and cowardly behaviour (e.g., use of humans as shields). The military professional must not only be agile and resilient, but continue to be objectively and emotionally battlespace-mature.

Theme 3: Human Complexity

"It's an illusion to think that there is a military solution for Afghanistan." This remark exemplifies the need for a non-hierarchical 'whole of government approach' and the increasing reliance on multi-national efforts in response to foreign conflicts. While collaborative efforts promote legitimacy and efficiency, there are many obstacles to ensure effectiveness. Creating trust and encouraging decision-sharing among peers, superiors, coalition partners, target populations, other government departments, and non-government organizations is a key challenge. During the session many ideas and concepts emerged around the challenges posited

above.

Any one of these thematic challenges seems daunting, but important advances have been made. The Defence S&T Symposium 2008 highlighted the state-of-the-art research in these areas with representation from defence and security, academia, and industry. The paradigm has shifted, and research in the new and future security environment is responding in kind. Conclusions that emerged over the course of the two days reinforced the fact that the battlespace has changed. No longer are military operations about winning the next high intensity battle; they are about establishing the conditions for self-sustaining stability. By working towards the development of models and concepts to better understand and influence the human in the battlespace, the S&T community should be well positioned to enable an agile and adaptive Canadian Forces.

Le but du Colloque S & T pour la défense – deuxième d'une série se déroulant sur trois ans – a été d'explorer plus en détail les questions conflictuelles centrées sur l'humain. Le symposium de 2007 défiait la communauté S & T de répondre à ces questions, présentées dans trois domaines de conflits : conflits entre personnes, conflits entre la personne et la nature, conflits entre la personne et elle-même. Pour l'année 2008, on a ajouté un autre domaine, le partenariat entre personnes, qui se focalise sur une approche holistique du conflit.

Le Colloque S & T pour la défense 2008 a décortiqué le sujet et présenté des recherches de pointe qui commencent à résoudre les questions axées sur l'humain présentes dans l'environnement de sécurité. Le Canada et les Forces canadiennes ont un ennemi inhabituel dans un espace de bataille largement régi par l'idéologie. Un besoin urgent d'améliorer l'état de préparation et la protection de nos combattants de première ligne se fait sentir, et nous devons avoir une compréhension pratique de l'intervention multi-organisationnelle en cas de conflit. Ces trois défis définissent les thèmes principaux de ce colloque.

Thème 1 : L'intention de l'adversaire

Les panélistes ont étudié à fond le concept que l'après-guerre froide ait enregistré une augmentation notable de violence transnationale contre les intérêts occidentaux. Le fait que les états défaillants et en déroute donnent asile aux terroristes et que des messages extrémistes soient diffusés par les mass médias constituent certains des défis actuels. De plus, la couverture médiatique immédiate et finement détaillée d'actions non intentionnelles (p. ex., les dégâts collatéraux) annihile les bonnes actions d'une campagne de « cœur et d'esprit ». Une intervention stratégique réussie nous oblige à comprendre l'adversaire et son environnement. Cette stratégie ne doit non seulement anticiper l'adversaire, mais aussi influencer son intention. L'art d'influencer a évolué depuis des millénaires; la science de l'influence pourrait nous mener plus loin. Concevoir une stratégie dans l'espace de bataille nous oblige à voir en nous-mêmes afin de comprendre nous-mêmes et nos intentions à l'égard de nos adversaires.

Thème 2 : Comprendre l'influence de l'espace de bataille

Les défis qui ont fait l'objet de discussion pendant cette séance s'articulaient autour de la reconnaissance qu'il n'y a dans cette profession d'armes de ressource plus importante que l'humain. Mais, le problème posé par le recrutement, l'instruction et la conservation de militaires professionnels est aggravé par des demandes multiples. Le militaire professionnel moderne doit s'adapter et utiliser des compétences multifonctionnelles (c'est-à-dire, allant de celles d'un négociateur à celles d'un utilisateur de force létale), dans des rôles

multidimensionnels (p. ex., la guerre à trois volets) et sous la pression de multiples facteurs stressants environnementaux (aussi bien physiques que psychologiques). Le défi est d'autant plus grave qu'il faut assurer des prises de décisions morales et éthiques face à des atrocités et des comportements lâches (par exemple, les boucliers humains). Le militaire professionnel ne doit pas seulement être agile et tenace, mais aussi continuer à faire preuve de maturité objective et affective dans l'espace de bataille.

Thème 3 : La complexité humaine

« Il est illusoire de croire en l'existence d'une solution militaire pour l'Afghanistan. » Cette remarque illustre le besoin d'une « approche pangouvernementale » non-hiérarchique et la dépendance de plus en plus grande envers les efforts multinationaux pour répondre aux conflits étrangers. Si les efforts de coopération favorisent la légitimité et l'efficience, de nombreux obstacles entravent l'atteinte de l'efficacité. Le principal enjeu consiste à stimuler la confiance et à encourager les décisions communes parmi les pairs, les supérieurs, les partenaires de coalition, les populations, les autres ministères et les organismes non gouvernementaux. Lors de la séance, un grand nombre d'idées et de concepts ont surgi autour des défis ci-dessus énoncés.

Chacun de ces défis semble intimidant, mais d'importants progrès ont été faits. Le Colloque S&T pour la défense 2008 a mis en exergue les recherches de pointe dans ces domaines grâce à des représentants de la défense et de la sécurité, des universités et de l'industrie. Le paradigme a changé, et les recherches dans le nouvel et futur environnement de sécurité renvoient l'ascenseur. Les conclusions dégagées au cours des deux jours ont renforcé le fait que l'espace de bataille a changé. Les opérations militaires ne consistent plus à gagner la bataille de haute intensité, elles visent plutôt à établir les conditions pour une stabilité autonome. En focalisant ses efforts sur l'élaboration de modèles et de concepts destinés à améliorer la compréhension et l'influence de l'humain dans l'espace de bataille, la communauté S & T devrait être bien placée pour rendre les Forces canadiennes agiles et adaptatives.

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14. KEYWORDS, DESCRIPTORS or IDENTIFIERS (Technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus, e.g. Thesaurus of Engineering and Scientific Terms (TEST) and that thesaurus identified. If it is not possible to select indexing terms which are Unclassified, the classification of each should be indicated as with the title.)

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