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TECHNOLOGY AND THE FUTURE OF WAR

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ABSTRACT

The drive for technological superiority in the pursuit of dominance in the future battlefield may create the myth that technology alone can provide all the solutions. This belief has led many western militaries, especially the United States, to invest heavily in military technological development. However, the changing global socio-political conditions may force the rest of the world, particularly less well-endowed adversaries to seek asymmetric approaches when countering advanced militaries. This paper argues that the over emphasis on technological military investment by Western nations, particularly the United States, in search of technological “silver bullets,” will not be sufficient to deal with threats from potential adversaries that seek to level the military playing using asymmetric means.

INTRODUCTION

“War, far from being an exercise in technology, is primarily a contest between two belligerents.”¹

Martin van Creveld

The long-established link in the relationship between defence policy and technological research, particularly in the area of military applications,² stems from mankind's unending search for the ultimate solution to defeating his foe in the battlefield, using technology as an enabler. This link of warfare to technological research experienced a sudden surge during the 1973 Yom Kippur War³ with the introduction of new-age technology like the Soviet anti-tank and anti-aircraft missiles that inflicted severe casualties on Israeli tanks and fighter aircraft. Since then, a great deal of investment has been placed in military technological research both in the West (particularly the United States), in the Soviet bloc countries, and in recent times the Asia-Pacific region. History has shown, however, that reliance on technology alone does not assure success in war, even if it is waged against a technology-deficient adversary. While technology may form a good starting point when thinking about war, and will also be a crucial factor in the prosecution of war, it is not the ultimate tool of decision when it comes to determining the outcome. Both Holland and France saw defeat in Indonesia and Algeria, respectively, despite having relatively superior technology.⁴ Even super powers have not been spared the humiliation of defeat when faced with a technologically weaker adversary. The former Soviet Union's experience in Afghanistan, and more recently in Chechnya, reinforces the notion

that technological superiority alone does not guarantee victory in the battlefield, let alone the negotiating table.⁵

The thesis of this paper argues that the over emphasis on technological military investment by Western nations, particularly the United States, in search of technological “silver bullets,” will not be sufficient to deal with threats from potential adversaries that seek to level the military playing using asymmetric means. The paper will first examine the quest for technology within the Revolution in Military Affairs (RMA) by the West, particularly the United States, in evolving the military of the 21st century. This will be followed by a brief look at possible competitor responses to this move by the West to attain technological superiority. The paper will then discuss the conditions that will allow asymmetric means to be adopted by less well-endowed nations, and the probable proponents of such warfare. The argument will then focus on military and non-military means of asymmetry that could be employed by such adversaries to achieve a bargaining position when dealing with a technologically superior opponent.

THE REVOLUTION IN MILITARY AFFAIRS (RMA)

A revolution in military affairs (RMA) is said to occur when “a combination of technological, organisational, social, doctrinal and political-economic changes take place in conjunction and affect the way militaries plan, equip and train to wage war.”⁶ The Soviets used the term “military-technical revolution”⁷ since in

their view RMA was primarily technology-driven. Such a revolution is characterised by the occurrence of a dramatic change that results in an equally dramatic change in doctrine, force structure and the way of war fighting. However, the advent of RMAs and their association with rapid technological advances has not always been a direct co-relation. In the case of the French Revolution, which coincided with the Industrial Revolution, the concept of mass incorporation of people into the armies of that era (the early 1800s), or *levee en masse*, was a more significant contribution to success than any output from the Industrial Revolution itself.⁸ In fact, the weapons used were no different from those employed in wars a hundred years earlier! The essence of the revolution is not in the invention of the new technology itself,⁹ but rather the manner in which such technology is innovatively incorporated into the organisation, its doctrine and employment in warfare.

RMA AND THE UNITED STATES

Western nations, in particular the United States, currently lead global research in military technology, and with the demise of the Warsaw Pact after the Cold War, there seems to be no clear credible competitor in this area. The capacity of the United States to sustain military technological research at its current level and intensity is significantly facilitated by its massive economy¹⁰ and the ability to synergise private sector research and development with military and government requirements.¹¹ The post-Cold war emergence of the United States

as the dominant global power, and its desire to maintain that status, has also created a “dreadnought factor”¹² effect, where there is a constant paranoia of some other nation making that special technological leap forward, leaving the United States behind. The fear of being relegated to “strategic inferiority”¹³ has created the impetus and drive for the search for technological superiority.

One of the major bi-products of technology, especially when many innovative discoveries have been successfully implemented in the military system (as in the case of the United States), is faith in technology.¹⁴ This fascination with technology drives the search for the so-called ‘silver bullet,’ or ultimate solution. In this respect, many analysts have opined that the U.S. military has become too technologically complex,¹⁵ to the extent that the search for technological silver bullets has made the United States (and their role in the context of NATO) less effective, and perhaps even more vulnerable to certain threats than they should be. The notion that American forces, with their technological might, being able to fight and win a conventional or even nuclear war against the Soviets and Chinese¹⁶, will be able to easily overcome a lesser adversary, may be a false one that re-visits the follies of the Vietnam era.

The question that must be answered is whether the costs and risks associated with the vigorous pursuit of technological advancement outweigh the expected benefits¹⁷, and whether indeed such benefits are the exclusive domain of the western nations. Although most nations, who are in the small to middle power band, may not have the same capacity as the United States to optimise the benefits of technological research (let alone pursue it with the same intensity

and vigour), there is a danger of assuming that all third world countries cannot have and operate modern military forces.¹⁸ This type of mind-set has already established precedence in the commercial world where American businessmen have underestimated Japanese and Korean competition, and paid for this error in judgement. The “American Way of War,”¹⁹ that is forcing an opponent to succumb by the use of overwhelming force and technology, may not be applicable to every war scenario. The lessons learned from the technological misadventures of the Vietnam War are apparently being clouded by the residual effect of the success of the use of technology in the Persian Gulf War.²⁰ During the Vietnam War, the use of Agent Orange to flush out the Viet Cong as part of Operation Ranch Hand²¹ not only failed to achieve the desired end-state, but in the process also caused casualties amongst the local civilian and American military population. Failure to understand the limitations of technology can lead to dire consequences.

COMPETITOR RESPONSES

There is a widening gap in technological capability between the West, particularly the United States, and the rest of the military world. Most countries are weapon importers rather than producers that do not have sufficient critical mass of technical expertise and infrastructure to seed the growth of military technological research and production. Furthermore, the focus of local industry in these countries will usually be directed at sustaining the economy, and what little

that can be spared in the pursuit of technological research may not have sufficient critical mass to make a significant difference. This disparity in status between the United States and the rest of the world will encourage (and perhaps even force) opponents and potential opponents to seek alternative solutions to level the playing field.²² Even in the case of NATO, there is a growing disparity between the United States and the remaining members, and here again some alternatives to balance the disparity in capabilities, within an alliance, must be sought.

Essentially there are two broad possibilities with respect to responding to a technologically advanced competitor; one is a symmetrical response and the other an asymmetrical response.²³ A symmetrical approach involves emulating the qualities of the opponent, and this has historical precedence. The near defeat of the Soviets in 1941-42 by the German *blitzkrieg* operations led the Soviets to subsequently emulate the *Wehrmacht's* methods and in turn defeat the Germans.²⁴ In a current context, not many nations can emulate the United State's capacity for RMA, although Russia is a prospective candidate²⁵ despite its economic woes and political instability, as it is still continuing its military modernisation, albeit at a slower pace. The asymmetrical approach, on the other hand, pits the strength of a military force against the weakness of its adversary. This was evident during World War II when German U-boat technology was pitted against commercial shipping (that were used to sustain the Allied war effort) to counter the strength of superior Allied surface forces.²⁶ This was also the case during the Vietnam War when Nguyen Vo Giap conducted guerrilla

“people’s war”²⁷ against the American troops. The Egyptian use of the SA-9 Sagger missiles in the early stages of the Yom Kippur War and the Mujaheddin use of American Stinger missiles against Soviet aircraft in the Afghan War are further examples of asymmetric application of medium-technology, low end equipment²⁸ to compensate for the tactical disadvantages faced by the Egyptians and Mujaheddin. It can be argued, therefore, that the benefits of advanced technology may be negated when pitted against technologically deficient opponents who use a combination of dispersed operations,²⁹ in densely populated or vegetated environments, with little or no traceable signature. It appears, therefore, asymmetry becomes the choice of many nations that wish to effectively oppose the West so that the playing field is levelled. However, before that can happen, we need to understand the conditions that enable such measures to be effective against the West.

SETTING THE STAGE FOR ASYMMETRY

The technologically savvy western nations are also perhaps the largest collection of democracies, and such a socio-political system has certain vulnerabilities. The path of democracies are determined by the “fifty-one percent rule”,³⁰ where decisions are generally not a product of collective public wisdom but rather based on how the public aligns itself on a particular issue.³¹ They are therefore easily influenced by factors affecting perception, which in turn affect reality. The passion of the people in a process like this can have a self-negating

effect³² where the impact of public opinion and pressure groups can create tension in the democratic state and affect the execution of its policies. This becomes particularly important when examining the arguably unreasonable expectations of western societies on the outcomes of military operations especially with regards to casualties.³³ The western public, particularly the United States, has a serious aversion for protracted warfare and the associated high incidence of casualties. The myth of a bloodless war has been perpetuated by the media in the Persian Gulf War of 1991³⁴ that focused mainly on the broadcast of precision-guided munitions strikes on targets. This type of engagement only formed six percent of the total bombs used. What was not shown was the bloody scenes off camera.³⁵ This abhorrence for casualties can become the focus of an attack. The dragging of the U.S. soldier through the streets of Mogadishu during the Somalia operations destroyed U.S. public support for American presence³⁶, and that set the stage for eventual American withdrawal from the area.

The perceived universality of western values and concepts is an important aspect. Western tendency, especially in the United States, assumes that the rest of the world shares the same social and cultural values.³⁷ This tendency to view the rest of the world as “populated by frustrated or potential Americans”³⁸ is basically a case of not placing themselves “in the other person’s moccasins.”³⁹ This phenomenon is also prevalent in the military where the technology oriented western mindset⁴⁰ assumes a certain degree of superiority over any adversary due to their superior technology, and in the process makes a distorted analysis of the possible asymmetrical threat they may encounter. This was evident in the

Vietnam War. Despite America's technological superiority, and over thirty years of involvement in the Vietnam theatre of operations, there was little or no understanding of the Vietnamese as a nation, much less as an adversary.⁴¹ This apparent ignorance was not because American soldiers were intellectually inferior, but because they had certain ingrained beliefs and perceptions of the Vietnamese that distorted their ability to learn from what they saw and experienced. American troops were briefed that the Viet Cong were basically inferior soldiers incapable of standing up to America's technological might.⁴² This was perhaps a significant aspect for American failure in the Vietnam War. Such an "obtuse mindset"⁴³ can distort military thinking and assessment at both the strategic and operational levels, which will have a serious implication when required to understand and react to asymmetrical warfare strategies.

The internal conditions that influence western nations' reaction to asymmetry are also affected by changes in the military and political environment. Information age technology is rapidly taking away a nation's ability to exert absolute power over both internal and external audiences. This phenomenon, which Walter Wriston describes in his book as the "twilight of sovereignty,"⁴⁴ will see the gradual and apparent demise of the traditional concept of the nation-state. Although the nation-state itself will still be relevant, it will no longer be the predominant political mechanism, as "trans-national and supra-national organisations will increasingly constrain the sovereign latitude of individual states."⁴⁵ The rise of these non-state actors, like religious groups, terrorist organisations and drug cartels, has taken away the war-making monopoly of the

nation-state, and to some degree their very sovereignty. These “sub-national groupings,” claiming recognition in the international arena,⁴⁶ come into play when nations deal with one another, especially in times of conflict, and this increases the complexity of international relations. National governments will not totally lose power, but will end up sharing this power with non-state actors,⁴⁷ who may be the actual perpetrators in a conflict. The traditional concept of destroying the enemy’s military, as well as his war-making capabilities, as a military goal, becomes difficult as non-state actors confuse this co-relation with the sovereign state. In the case of a western military, like the United States, the additional tension of rising domestic public opinion will make defeat of such an enemy very challenging.

National economy and wealth has a direct bearing on a state’s ability to allocate sufficient resources for military technology research and development. America’s wealth has leveraged its ability to pursue and reap the benefits of RMA,⁴⁸ and in the process break away from the rest of the world’s military. The reverse is true for the poorer nations. Even NATO members, most of whom cashed-in on the post-Cold War peace dividend by slashing their defence budgets⁴⁹ and downsizing, are finding a growing disparity between the capability of the United States and the rest of NATO. This was apparent in the NATO-led air campaign in Kosovo, in the spring of 1999, where American aircraft delivered seventy percent of the firepower and ninety percent of the precision bombing as the U.S. was the only one with all-weather precision capability.⁵⁰ If western nations in NATO have to tighten their belts, then the poorer nations, that are

even more resource scarce in terms of funding military development, will have to look at asymmetrical options to compete in the international arena.

The information age has also brought along with it accessibility to technology that was previously beyond the reach of poorer nations. Western nations have also lost the ability of maintaining a monopoly on critical state-of-the-art technology,⁵¹ which allows filtering of such technology to potential competitors, including non-state actors. The situation is complicated by the fact that many nations can now easily invest in high-end technology through commercial means, especially in the area of computer technology, that have no immediate threat, militarily, but can be developed into potential force multipliers.⁵² Accessibility to such technology can negate the dominant effect of western military power.⁵³ Though these poorer nations may not be savvy in the latest air-land doctrine, many of them do understand perception management and information warfare, and they will use it.

Coalitions and alliances have been a recurrent feature over the decades, and given the changing nature of militaries and global social-political conditions, it is apparent that multi-national coalitions will be the dominant force structure in future global conflicts.⁵⁴ Resource constraints (especially in light of the recent economic crises) and the need for legitimacy in the conduct of these operations drive the need to form coalitions. Since coalitions are organisations temporarily assembled to handle a conflict, there are inherent problems of inter-operability as well as addressing the specific national interests of the nations that form the coalition.⁵⁵ Once national interests no longer conform to the aims of the coalition,

keeping the coalition together will be a daunting task. These will become potential seams in coalitions that can be attacked by an opponent in a conflict.

An important and crucial aspect of the information age and the impact it has on providing a fertile ground for the growth of asymmetrical warfare is the conceptual collapse of the three levels of war. Information technology will blur the distinction between these three levels,⁵⁶ namely, the tactical level, the operational level and the strategic level. Any attack, especially of a covert nature, at any level, will have a direct impact on the other two levels. The use of information systems that are intended to provide a higher level of autonomy to all fighting levels within the organisational structure (as is the case with the development of the U.S. military) will cause the action of the single soldier to have a potential impact on the outcome of the conflict at the operational and strategic levels,⁵⁷ and this effect will be magnified by the presence of international media. This has caused an effective collapse of the levels of war into an intimately inter-twined interactive entity. This particular assumption will be used to carry on the argument in this paper on the use of asymmetry to level the playing field.

The various conditions stated above not only create the opportunity for weaker nations to use asymmetry as a means of countering the advanced western nations, but also in fact may lead to asymmetrical warfare becoming the preferred choice when dealing with a superior adversary. In particular, western society's intolerance for casualties, its over-dependence on information systems, and the fragility of coalition operations will be the Achilles' Heels that will become the focus of asymmetric attacks.

THE ASYMMETRIC OPPONENT

The typical soldier in a traditional military organisation is trained and groomed to fight an opponent who is very much a mirror image of him in terms of fighting ethos and methodology. Western militaries, in particular, are characterised by discipline, structured doctrine, and bound by moral and ethical codes of conduct and behaviour that also influence their ability to relate to an adversary. Unfortunately, the changing global scenario is introducing a new breed of opponents, called the “warrior class,”⁵⁸ who will become formidable adversaries of the future. These new warriors emerge from a social pool characterised by poverty, poor education, and an environment that has generally been unstable and conflict-ridden.⁵⁹ Unlike the soldiers in a traditional military organisation, these warriors are best described as “erratic primitives of shifting allegiance, habituated to violence, with no stake in civil order.”⁶⁰ This emerging class of warriors range from the under classes that possess “no skills marketable in peace,” to the patriots that take up arms in the fervent belief of a just cause.⁶¹ The most dangerous of these warrior classes are the failed military men,⁶² who compensate for their failure to function in a military environment by taking the role of warlords, creating a following of other warriors, and rise to the status of non-state actors that become a force to contend with when dealing in a conflict.

These warlords are very wary of the fact that a direct confrontation with a western military force, especially one as powerful as the U.S. military, will result in a devastating defeat.⁶³ That is the very reason that asymmetry becomes an

attractive option to balance such a deficiency on their part. Using various combinations of merciless violence, these warlords confront western militaries with situations that they are not prepared to deal with, and where an appropriate retaliatory response would be constrained on the part of the latter due the values of western society. Warriors deem peace the least desirable state of affairs⁶⁴ as they seek stability in a chaotic environment where they can leverage their power and influence against the government or against a western adversary that is fearful of a protracted conflict where mounting casualties can result in diminishing public support, both in the theatre of conflict as well as at home.

ASYMMETRIC OPTIONS

The use of asymmetry in warfare is not a new concept. The basic assumption of asymmetry is that military power does not operate in a vacuum⁶⁵ and are influenced by political, cultural and economic factors apart from the traditional factors of mission, enemy, terrain, troops and time (METT-T). Therefore, asymmetrical warfare will take on both a military as well as a non-military (or unconventional) dimension.

There are a varying number of military asymmetric options available, the simplest being the lone Mujaheddin warrior using a Stinger missile to down a state-of-the-art fighter aircraft. For the purpose of this paper, however, the focus will be on information warfare (IW) and weapons of mass destruction (WMD),

which are two methods of military asymmetry that will have a significant impact on modern military forces.

Information is power, and because it is not an exclusive commodity of the rich, accessibility is universal. The rapidity of dispersion of information and knowledge, and knowledge being the “fundamental capital stock of the information economy”⁶⁶ form the cornerstones of the information age. Information and knowledge systems will therefore not only be guarded commodities, but will also form the main vulnerability of nations that make use of these systems as the bedrock of growth and stability. This gives rise to a new type of warfare known as information warfare (IW) that can range from physical to non-physical methods of attacking an enemy’s information and knowledge systems. “Wired nations,” like the United States, are particularly susceptible to this type of vulnerability.⁶⁷ This is specifically the case for the U.S. military that has a high dependence on information systems and information-system concepts like the digitised battlefield and network-centric warfare⁶⁸ that make it vulnerable to cyber-attacks. Such attacks are an attractive low-cost option for taking on advanced nations, either as strategic information warfare or as cyber terrorism,⁶⁹ using skills that are easily pooled from the commercial sector. This is not a far-fetched idea as in 1995 alone the U.S. Department of Defence was attacked 250,000 times by anonymous hackers, many of whom probably operated from a home personal computer!⁷⁰ In 1997, Exercise Eligible Receiver, a simulated IW attack on U.S. information systems, showed that it was possible to shut down large portions of the power grid and command and control systems of the U.S. Pacific

Command.⁷¹ In February 1999, hackers intercepted and re-programmed the British *Skynet* military communication satellite system.⁷² Such cyber-attacks do not fall distinctly within the domain of war⁷³ and it will be extremely difficult to take action against 'phantom' perpetrators.

IW need not be carried out exclusively through "over-the-wire digital techniques"⁷⁴ but can also include physical attacks on information infrastructure, supporting components, or a combination of these methods (either by using one technique to mask the rest or using the combined effect of the various methods). One example of this is the satellite systems. While the advanced militaries have military satellites, there is also a growing reliance on commercial systems.⁷⁵ It is relatively easy to tamper with commercial systems, with some repercussions on military operations, and such exploitation is one short of war, which also means that effective retaliation is near impossible. While the effects cannot totally cripple the advanced systems of the west, the 'down-time' created is sufficient to disrupt operations. Given the United States' dependence on satellites for everything from communications to weapon guidance, this becomes an exploitable vulnerability.

Attacking the decision-making process is particularly effective especially in an information-rich environment, where decisions are made at every level including that of the individual soldier. The human decision-making process is based on knowledge systems and belief systems, and both become targets for influencing the adversary's decision-making behaviour.⁷⁶ Belief systems, in particular, are individualised,⁷⁷ and can be easily influenced. The 1857 – 58 Sepoy Mutiny in India was instigated by rumours that rifle cartridges had been

coated with animal fat (which was against Hindu and Muslim custom).⁷⁸ Although it could be proven that the rumour was untrue, belief took precedence over knowledge that gave rise to the mutiny. In an environment where soldiers have to make decisions, especially in Operations Other Than War, their beliefs and perceptions become an even greater vulnerability. Decisions are made based on perceptions that are vulnerable to distortion that can influence the operational and strategic levels,⁷⁹ and this is a classic case where the collapse of the levels of war has a significant impact on decision-making. In the case of coalitions, there exist multiple culturally conditioned belief systems⁸⁰ which when attacked may create fissures in the solidarity of the coalition effort. Less advanced nations, therefore, can use IW as a force equaliser,⁸¹ especially against information system dependent nations like the United States, since the effectiveness of employment is dependent on the quality of the application rather than the quality of the technology (or lack thereof). This will give smaller opponents the edge if they are better adept at application either for their own gains or to retard that of their adversaries.

The acquisition and potential use of weapons of mass destruction, however, add a different dimension to asymmetric threat. The main aim of an adversary in using such devices is to present the potential of being able to hurt a target audience, and in the process be able to achieve bargaining power.⁸² While the threat of a nuclear attack from a belligerent nation or even a non-state actor persists, it is unlikely that actual use will be effected since the west has a credible deterrent nuclear capability.⁸³ However, there is still an ever-present danger of

use if the belligerent party decides to make a point, and while the results may not be decisive, the potential casualties that result will have an impact on western society. Chemical and biological weapons are a more likely threat and they have been used in modern day conflicts like that in the Balkan conflict. Many of the parties to state-sponsored terrorism, like Libya, Syria, Iraq and North Korea, have refused to sign the 1993 Chemical Warfare Convention (CWC)⁸⁴ and therefore have the potential of using such means against an adversary like the United States or a western multi-national coalition. The effects of these devices, especially biological weapons, take some time to be visible and therefore it may be difficult to ascertain the actual perpetrator.⁸⁵ This is an ideal situation of being able to induce widespread illness without the target audience being able to pinpoint the source and take retaliatory action.

Non-military asymmetry has far wider options as the means are generally unconventional, and for the purpose of this paper, the focus will be on terrorism and the use of human shields. The use of these measures is targeted at the western mindset and values. The most effective of these is terrorism, especially state-sponsored terrorism. Like IW, terrorism is a favourite tool of leverage for poorer nations and non-state entities because it is an efficient employer of force⁸⁶ that can be used to subdue, coerce or disrupt the normalcy of an opponent, even if that opponent is technologically superior. Although there is no single definition of terrorism, it may best be described as a “force employment process in which abnormal lethal force is used against a symbolic victim to affect the will of a

target entity.”⁸⁷ The central object of terrorism is to instil fear, in a systematic and purposeful manner, in an opponent either by direct action or by attacking something that is of interest to the opponent, and in the process force the opponent to give in or adopt a bargaining posture that is usually not in his favour. Contrary to popular perception, the modern terrorist is not an insane fanatic, but rather an intelligent individual who is driven to the extreme (based on his perception) by his situation.⁸⁸ He is usually part of a small core group that is supported by a large following of sympathisers, and is also able to use the technology that is readily available in the market to effect fear generation in a manner that was not conceivable by his predecessors. Just as war has been an extension of politics, terrorism (especially state-sponsored terrorism, like that practised by Libya) will become the extension of what is known as armed diplomacy, which is “diplomacy by intimidation through the threat and use of terrorism.”⁸⁹

The main problem when dealing with terrorism is that it straddles a fine line between crime and warfare, employing a mix of diplomacy and force to achieve strategic objectives. Therefore the appropriate response requires a combination of instruments (police, military and political) that may be well beyond the purview of the military commander, especially if the act is within his theatre of operation. While the employer of terrorism understands that decisive victory may not be attained, achieving a desired level of terror within the target audience will set the stage for the bargaining table.⁹⁰ In the case of an advanced opponent like the United States, the target audience will most likely be the American public

whose low threshold for casualties becomes the Achilles' Heel. The aim will be to wear away home front resolve to continue with the military campaign and in the process establish conditions for American withdrawal of forces.

Many of the recent conflicts have seen the introduction of innocent non-combatants into the battlefield to further the cause of the belligerent party. Somali Warlords, Libya, Syria, Iraq and Serbia liberally practised, in various conflicts, the concept of using 'human shields,' or "moving collateral to the targets."⁹¹ Placing non-combatants, or even combatants, in the line of coalition force firepower hits at the very values of western society, and as a result the belligerents gain the upper hand in the situation. In the recent Balkan conflict, Serbian leaders chained captured U.N. troops onto potential U.N. targets and then invited CNN to film the scene to observe western reaction!⁹² Not only did the Serbian leadership send a potent message to the U.N. leadership, but also they were also able to get reaction from the political level even before the U.N. ground commanders were aware of the situation. Saddam Hussein did the same during the Gulf War when he placed his military assets within civilian compounds, knowing that it would cause a dilemma for the Coalition in trying to destroy military targets without civilian casualties.

In all the methods of military and non-military asymmetry employed, the targets were the Achilles' Heels of the western nations. In each of the cases there was an impact either from a perspective of unacceptable casualties, strain on the coalition or semi-paralysis of the information systems. Many of these

asymmetric attacks are also non-attributable, and this anonymity becomes their shield, making any retaliation on the part of the target a self-limiting pursuit. The intention was never to achieve a decisive victory, but to create sufficient threat so that the belligerent could level the playing field and posture himself in a stronger bargaining position.

CONCLUSION

History has shown that nations that have learned painful lessons through war relate more readily to their weaknesses and therefore are more open to creativity,⁹³ especially under developed nations that have suffered the consequences of periodic strife in their region, and in the process have learned to innovate to survive. Nations must come to terms with how they will deal with the changes brought about by the current RMA (if indeed there is one) and that, to a great deal, depend on their standing in the international community. For many of the western nations, particularly those in NATO, it will mean some form of symmetry (probably concentrating on niche areas of technology) to address the growing inter-operability gap between themselves and the United States. Technologically advanced nations like the United States need to look beyond just technological silver bullets as the solution and be wary of asymmetrical threats.

Non-aligned nations, many of which do not have the capacity or conditions to set and reap the benefits of technological revolutions, will need to resort to asymmetric options to have a bargaining voice in the international community.

This latter group, essentially the 'have nots', will end up making the best use of what they have reasonable access to, and use innovative ways to leverage on the vulnerabilities of western nations. In their case, the true revolution takes place in their minds, and those nations (or entities like non-state actors) that get their strategy right will be able to overcome any weaknesses in their military system.

Today's advanced weapons were designed to operate in the classical Clausewitzian Trinitarian environment⁹⁴ but with the gradual demise of conventional warfare these weapons may not provide the solutions to winning a conflict. There is a need for technologically advanced militaries to understand that a decisive outcome cannot be achieved by technology alone,⁹⁵ and they must overcome the mistake of over-reliance on technology and what it has to offer. As Carver Mead had put it, "we are limited, not by our technology, but by the way we think."⁹⁶ If indeed "poverty is the father of ingenuity,"⁹⁷ then many of the less well-endowed nations have the greatest potential of thinking creatively, using asymmetric means to counter a technologically superior adversary.

This paper has argued that there seems to be an over emphasis on technological development, particularly in western militaries, as the solution to maintaining the edge in future war fighting. While technology does allow military dominance to an extent, western militaries should not ignore the changing global social-political conditions that will force opponents and potential opponents to seek asymmetrical solutions. The targets of these asymmetrical attacks will be the very values and beliefs of western society, which they will leverage to get to

the bargaining table. Anonymity will be the shield of asymmetrical opponents and that will become a self-limiting factor when pursuing retaliatory measures, even if advanced technological means are utilised. The use of asymmetry will not be aimed at defeating an advanced military but more to catch the attention of the decision makers and gain a favourable position for negotiations. Asymmetry then becomes their silver bullet for levelling the playing field.

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