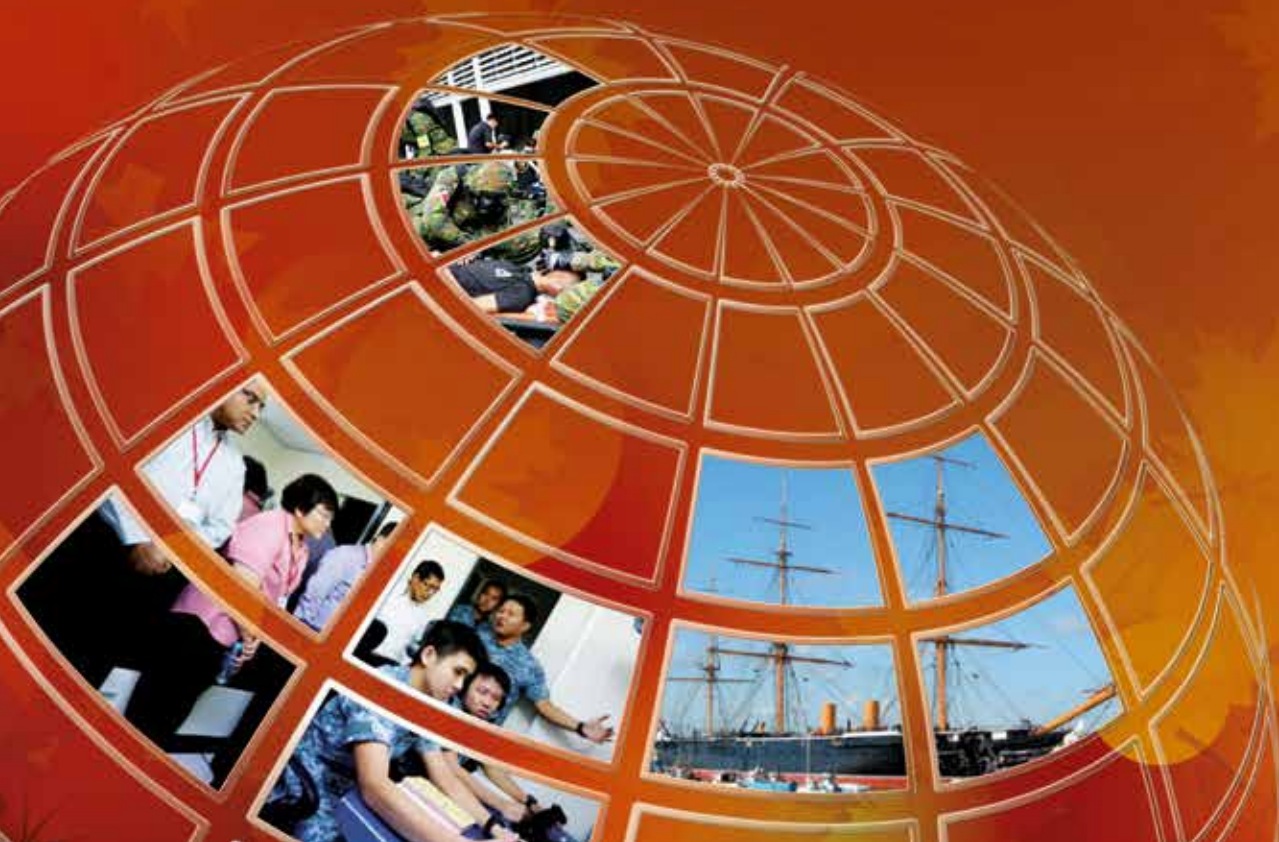


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Editorial

It has been an exciting period for us in the last three months, celebrating not just 50 years of the Singapore Armed Forces (SAF) on 1st July 2015 but, celebrating especially our nation's 50th birthday on 9th August 2015. Here, all Singaporeans unite as one people to celebrate the Golden Jubilee of our independence. However, we must always remember that the 50 years of independence that Singapore is enjoying now has been hard won and due to a strong and vigilant SAF. As Prime Minister Lee Hsien Loong said at the SAF50 Dinner held on 24th July 2015 to commemorate 50 years of the SAF giving strength to the nation: "So, as we celebrate the 50th year of the SAF, I salute all the past and current leaders of the SAF, the men and the women who have contributed through your service and to support our nation. Thank you. Thank you for being soldiers. Thank you for guarding and keeping Singapore safe."¹ We would like to pay tribute to all servicemen—the pioneers, the regulars and the NSmen who have contributed so much to keep Singapore safe and defend our sovereignty.

This issue of *POINTER* covers a wide variety of topics, ranging from a discussion on the merits of both sea power and air power, respectively, to an examination of non-lethal warfare today, to a historical coverage of the 1948 Malayan Emergency. Two other topics include a look at the evolving Cyber Threat – a very real and current menace globally as well as locally, and a general discourse on the emotional fitness of a soldier.

In 'Sea Power As A Strategic Domain', ME6 Khoo Koh Giok focuses on the unique characteristics of sea power and its strategic utility. In his essay, he defines sea power with reference to Alfred Thayer Mahan, an American historian and naval officer who was an expert on sea power in the late 19th and early 20th centuries. ME6 Khoo then discusses the characteristics of sea power, its strengths and limitations in the peace to war continuum and its contributions to the Diplomatic, Informational, Military and Economic (DIME) instruments of national power. He highlights that in some cases, sea power is the strategic tool of choice while in others, it is merely an enabler. He goes on to argue that sea power has limitations to be qualified as a strategic domain on its own. In his opinion, the culmination of land-sea-air powers into a combined military power provides countries with better flexibility and options to employ military forces to meet strategic objectives. He concludes that military power, instead of land-air-sea power in isolation, is better qualified as a strategic domain.

In a similar vein, MAJ Foo Yuk Min in his essay, 'Air Power – A Panacea To Future Armed Conflicts', also argues that it is a military force combined of land, sea and air power that will better serve a country and enable it to achieve its national objectives. MAJ Foo describes that the military force of a country usually comprises three key components: the army, the navy and the air force, all of which can stake a legitimate claim to be the most vital aspect of the military due to their various strengths. However, he also looks at the argument that in recent conflicts, air power can be seen as the most crucial component of the military. In fact, with air forces around the world developing more cutting-edge technology such as precision munitions and more efficient computing processors, as well as working on new operating doctrines, the future of military engagements seem to point to the skies as the key aspect of any country's military. After examining various examples of armed conflicts, MAJ Foo concludes that all three components of military force, that is, land, sea and air power are essential and that a military power comprising all three domains is better qualified to serve and protect national interests.

The next essay, 'The Humane Age of Non-Lethal Warfare' is written by MAJ Phua Chao Rong, Charles. According to MAJ Phua, there have been centuries of conventional warfare whereby each power strives to inflict as much damage as possible, whilst selfishly sustaining their own survival and pushing for their own causes. This is notwithstanding the fact that this kind of war causes collateral damage for all parties involved as well as civilian casualties. MAJ Phua adds that now, mankind has finally started to transcend violence and accept the fact that all it causes is more violence, that is, 'a vicious cycle of conflict', making long term peace solutions impossible. He then discusses the idea of a revolutionary age of Non-Lethal Warfare (NLW)—which is a more holistic form of asymmetric and humane warfare, in which non-lethal weapons are used to defeat the enemies and to achieve a swift yet benevolent victory. In this essay, MAJ Phua assesses the pros and cons of the various aspects of humane warfare and NLW at an operational level, and also assesses its overall applicability to the Singapore Army. MAJ Phua concludes that NLW will likely be the pacifist model of war for many decades to come as the world progresses towards a humanistic civilisation. In his view, it would also be a useful strategy-to-be for states like Singapore on a defensive posture, always deterring but ever ready to achieve a swift and decisive victory, should security be compromised.

MAJ Lim Yu Sing's essay is entitled, 'The Malayan Emergency (1948-1960) – Can Lessons be drawn for Present Day Situations?' In this essay, MAJ Lim details that following the success of the British insurgency during the Malayan Emergency, there has been a countless host of works aimed at uncovering the 'lessons' to be learnt from their victory in Malaya. His essay explores whether the lessons learnt from the case of the Malayan Emergency are indeed a practical template to base future counter-insurgency (COIN) campaigns on or, if the British Army's success was uniquely contextual to the situation in Malaya at the time and cannot be replicated in other COIN campaigns since each insurgency has its own distinct political and socio-economic character. The essay continues with an in-depth study of the situation during the Malayan Emergency, in an attempt to find out what the unique factors were that led to their success, what can and cannot be used as a 'template' for other COIN campaigns. In his conclusion, MAJ Lim states that the assumption that the Malayan Emergency is often viewed as a paradigm from which 'lessons' can be drawn for present day COIN situations is correct. However, MAJ Lim goes on to discuss the propensity by COIN 'practitioners' and 'experts' to 'template' the British experiences in the Malayan Emergency. He also adds that 'templating' has shown to be ineffective for the Americans and British in subsequent COIN campaigns because the 'lessons' drawn from the British 'success' in the Malayan Emergency are fundamentally not universally enduring COIN maxims independent of time, place and situation.

In the essay, 'Cyber Threat – A global Security Threat', ME5 Seah Ser Thong, Calvin explores the technology boom of the 21st century and highlights that this has led to the rapid rise and influence of the Internet on people around the world. According to ME5 Seah, the Internet has now become a universal information sharing platform that brings people from all walks of life closer together. However, this increased interconnectedness of information sharing has its disadvantages and perils. International hacking groups like

'Anonymous' have increased efforts to obtain information through illegal and unethical means, while cyber threats like the Stuxnet Worm has become increasingly prevalent. In response, an increasing number of countries are investing more into cyber security to combat these cyber threats. In this essay, ME5 Seah delves deeper into the nature and extent of cyber threats, its impact on the military and the potential cyber defence measures that could be explored.

The final essay, 'The Emotional Fitness Of A Soldier – Balancing Positivity And Negativity In The Military' is by CPT Chen Jingkai. According to CPT Chen, it is an unspoken fact that negativity and cynicism are damaging to many of the activities conducted within the military. Using examples from psychological studies and various cognitive experiments, CPT Chen argues that positivity can improve one's mental prowess—stating that this is particularly critical for commanders when it comes to training their men and especially out on the battlefield, to lead their men to safety. Conversely, a case is also made that negativity threatens the mutual respect between soldiers and their peers, as well as between commanders and their soldiers. CPT Chen feels that the contagiousness of both positivity and negativity has an important implication for the military—that the emotional fitness of every serviceman now becomes the responsibility of his fellow comrades. In this essay, CPT Chen seeks to use empirical evidence for psychological science to make a case for increasing positivity and decreasing negativity in the military.

POINTER would like to take this opportunity to bid a fond farewell to LCP Kayson Wang as he is posted to another unit. His positive attitude, diligence and meticulous work ethic are great assets to POINTER. We thank him for his contributions and wish him the very best in his future endeavours.

The POINTER Editorial Team

ENDNOTES

1. http://www.mindef.gov.sg/content/imindef/press_room/official_releases/sp/2015/24jul15_speech.html#.VdreJbJCriU

Sea Power As A Strategic Domain

by ME6 Khoo Kok Giok

Abstract:

The author focuses on the unique characteristics of sea power and its strategic utility. In this essay, he defines sea power with reference to Alfred Thayer Mahan, an American historian and naval officer who was an expert on sea power in the late 19th and early 20th centuries. He then discusses the characteristics of sea power, its strengths and limitations in the peace to war continuum and its contributions to the Diplomatic, Informational, Military and Economic (DIME) instruments of national power. He highlights that in some cases, sea power is the strategic tool of choice while in others, it is merely an enabler. He goes on to argue that sea power has limitations to be qualified as a strategic domain on its own. In his opinion, the culmination of land-sea-air powers into a combined military power provides countries with better flexibility and options to employ military forces to meet strategic objectives. He concludes that military power, instead of land-air-sea power in isolation, is better qualified as a strategic domain.

Keywords: Sea Power; Independent; Extension; Capability; Influence

INTRODUCTION

Nations rely on all available means to attain their national objectives. These means are instruments of national power, namely Diplomatic, Informational, Military and Economic (DIME). Power represents the ability to influence behaviours of others or events in a manner to support one's own objectives.¹ Military power, under the DIME framework, consists of land power, naval power and air power, skilfully employed individually or collectively to provide a military strategy to attain the strategic goals of the nation.² The utility of military power goes beyond winning conflicts. Military power also serves to contain or deter conflicts, influence or coerce other nations to change their decisions in our favour, or to provide assistance to other nations to expand our diplomatic sphere of influence.

Naval history dates back to the 5th century BC under the Achaemenid Empire against Greek and Egyptian threats.³ The Southern Song dynasty built a navy to safeguard its prosperity derived from coastal commerce.⁴ More recently, the British Empire, with a modest army, was founded on sea power.⁵ The Royal Navy was one of the world's most powerful navy, positioning Britain as the dominant world power from the 17th century to World War II (WWII).

This essay is motivated by the interest in the unique characteristics of sea power and its strategic utility. Firstly, it will define sea power with reference to Mahan and Corbett. Next, it will discuss the characteristics of sea power, its strengths and limitations in the peace to war continuum and its contributions to DIME. In some cases, sea power is



HMS Warrior, the world's first iron-hulled, armour plated warship.

the strategic tool of choice. In others, sea power is merely an enabler. The essay argues that sea power has limitations to be qualified as a strategic domain on its own. Instead, the culmination of land-sea-air powers into military power provides political masters with better flexibility and options to employ military forces to meet strategic objectives. Military power, instead of land-air-sea power in isolation, is better qualified as a strategic domain.

DEFINITION OF SEAPOWER

Although naval forces have existed for over two millennia, the concept of sea power only materialised when Mahan presented *The influence of Sea Power upon history: 1660-1783*, demonstrating through history that sea power was central to human development and to the rise and fall of great nations.⁶ Sea power has

two components, the military naval dimension and the maritime and commercial aspects of seafaring. Mahan's theory emphasised possessing naval power superiority characterised by superior warships, weaponry, tactics, commanders and the freedom of maritime trade for free exchange of material and information. As Mahan said, "*Control of the sea by maritime commerce and naval supremacy means predominant influence in the world... (and) is the chief among the merely material elements in the power and prosperity of nations*", suggesting that sea power is essential to the prosperity of nations and that nations ignore sea power at their own risk.⁷

Mahan's theory includes naval power and peaceful commerce and shipping, with the former securing the latter. Peaceful maritime trade leads to economic prosperity, generating resources to strengthen naval

power, leading to maritime supremacy, which further ensures peaceful maritime trade. Till described the inseparability between maritime power and prosperity as the 'virtuous maritime cycle', (*Figure 1 below*) with the British Empire as the best example.⁸ Britain, an island-group state, fulfils Mahan's key elements—geography, physical conformation, extent of territory exposed to sea, population size engaged in seafaring activities and character of the people and government—to become a sea power.⁹ Mahan's naval strategy calls for a decisive battle to destroy the enemy's main forces, Clausewitzian-style, for command of the sea. This secures Sea-Lines-Of-Communications (SLOCs) and the freedom of manoeuvre and action against enemy commerce and warships.

However, Corbett argued that command of the sea is untenable and warned against the reduction of maritime strategy for a blind pursuit of a decisive battle for command of the sea. While Mahan advocated the concentration of forces for decisive battles,

Corbett believed that this would not guarantee a major engagement.¹⁰ Enemy fleets could avoid and maintain *fleet in being* status. Instead, Corbett proposed sea control to ensure one's own forces' shipping access whenever necessary and sea denial to deny enemy access. Napoleon wrote, "*Let us be masters of the Straits (of Dover) for six hours, and we shall be masters of the World.*"¹¹ Command of the sea denotes an ideal situation when a nation dominates the seas unchallenged. This is indeed untenable today with the proliferation of anti-access anti-denial (A2AD) technology and asymmetric warfare. As such, sea control is more plausible.

Corbett believed that great issues between nations at war were almost always decided on land. Following Clausewitz, that war is a continuation of *politick*, Corbett stressed that maritime strategy should focus on what the fleet enables the army to achieve on land towards national objective(s). Fisher sees the army as a "*projectile to be fired by the Navy*", where

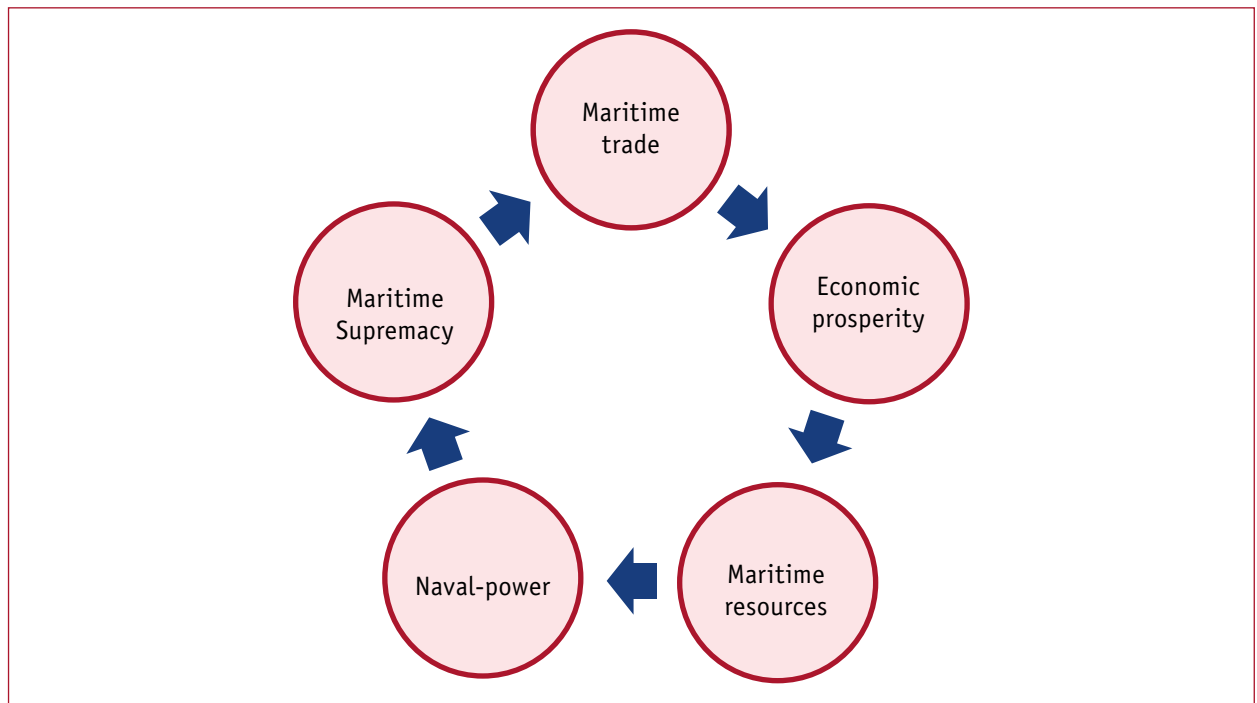


Figure 1: Adapted from Till's *Virtuous Maritime Cycle*¹²

the Navy's worldwide accessibility gave it "*inordinate power far beyond its numerical strength*."¹³ Gray added that while sea power merely enables a conflict to be won by air and land forces in some circumstances, it was instrumental in others, referring to the Pacific Campaign against Japan in WWII.¹⁴ Hart produced the *British Way of Warfare*, stating that Britain avoided direct confrontation on continental European land through the command of sea while securing the aid of allied land powers, an excellent example of Hart's 'Indirect Approach' to war.¹⁵

However, in the Royal Navy's review, maritime power remains relevant, with the ability to access crisis areas with mobility and resilience, sustain reach and lift capacity in joint campaigns, versatile posturing for diplomacy, and capacity for expeditionary operations.

Some doubted sea power's strategic effectiveness against a continental power with access to resources; together with air power theories and preoccupation on land control, Jan Breemer declared that "Naval strategy is dead."¹⁶ However, in the Royal Navy's review, maritime power remains relevant, with the ability to access crisis areas with mobility and resilience, sustain reach and lift capacity in joint campaigns, versatile posturing for diplomacy, and capacity for expeditionary operations.¹⁷ In the *U.S. Naval Operations Concept 2010*, influencing of events ashore, as Corbett said, remains the central idea of the United States Navy (USN). Indeed, sea power's unique characteristics allow it to transcend across all the four dimensions of DIME in today's world (*Figure 2*).

Essentially, sea power is the ability to influence people's behaviour or events by what we do at or from sea, in support of national interests. It covers the peace to war continuum and both dimensions of naval forces and maritime commerce. Unlike the army and air force, whose combat power is related to that of potential adversaries, the combat power of a navy is determined by the maritime assets and interest to safeguard. In this sense, sea power is a broader concept than land or air power, as neither includes the economic elements (maritime assets and commerce) of national interest to the extent that sea power does.¹⁸

CHARACTERISTICS AND STRATEGIC UTILITY IN THE PEACE TO WAR CONTINUUM

Over 70% of the planet's surface is covered by sea and about 75% of the world's population live in littoral zones within 200 miles from the sea. The cost-effectiveness of sea transportation enables over 90% of international trade, by volume, to be conducted via sea.¹⁹ These features give sea power its unique characteristics and strategic utility.

Firstly, 'freedom of the high seas' allows naval forces to navigate peacefully to gain access to most parts of the world.²⁰ This allows nations to show a presence of force that can be logistically self-sustaining anytime. This can be done either to support troubled allies, or to coerce or deter hostile nations, without the need of a host nation. Besides having a quick response to show a presence of force, naval deployment offers controllability to calibrate the level of commitment 'on-the-fly', while maintaining an exit strategy. Such strategic utility of naval forces was demonstrated on numerous situations.

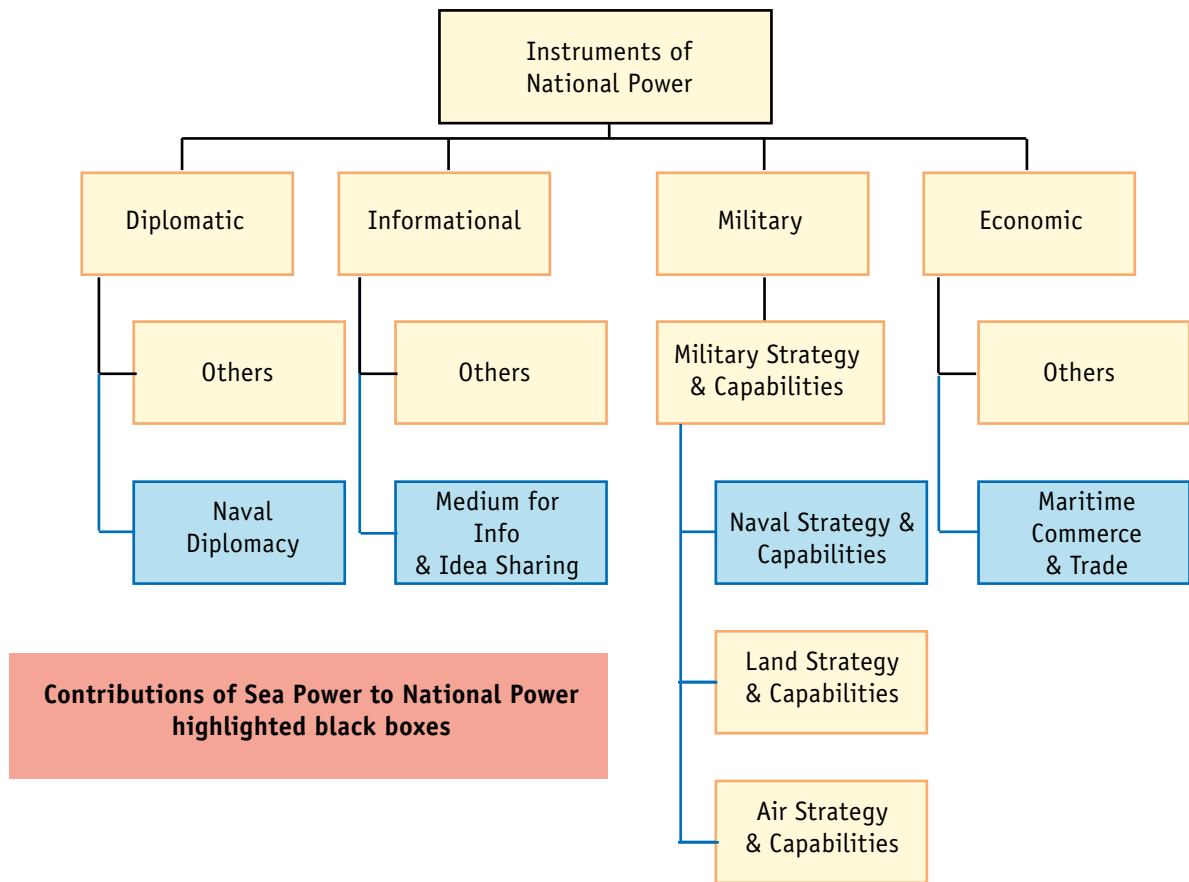


Figure 2: Adapted from Till's *Seapower* ²¹

TENSIONS AND CRISIS ESCALATIONS

During the Falklands War, Britain did not have an immediate contingency plan for Argentina's invasion of the Falkland Islands. Nevertheless, a British Naval Task Force (NTF) was deployed within two days after the invasion. The deployment showed Britain's claim of sovereignty over the Islands and her resolve to recapture them by force.

While the NTF was en route to the Falklands and while a military strategy was being developed, Britain spared no effort to contain and resolve the crisis through other instruments of national power, diplomatically

Unlike the army and air force, whose combat power is related to that of potential adversaries, the combat power of a navy is determined by the maritime assets and interest to safeguard.

through the United Nations Security Council (UNSC) and economically through sanctions, with the support of the European Economic Community (EEC), against Argentina.²²

Cable wrote, "maritime conflict is easier to limit and control than it is on land or in the air. It also inflicts lesser collateral damage. Warships ... can pose a threat and sustain it without a single warlike act. They can deploy on the high seas without commitment, wait, and gain time for diplomacy. If prospects look poor, warships are easier to withdraw."²³ Indeed, the NTF deployment allowed



The Argentinean Light Cruiser, ARA General Belgrano, sinking during the 1982 Falklands War.

political leaders to exert military pressure, buy time for peaceful resolutions and yet offer a ready exit strategy depending on how the crisis developed. The ability to deploy the NTF within two days of the Argentinian invasion and navigate towards the Falkland Islands uninterrupted by hostile forces offered Britain the policy space to contain the crisis escalation and an exit strategy thereafter should diplomacy succeed.

In the Cuban Missile Crisis, after discovering Soviet nuclear missiles in Cuba, the US Executive Committee of the National Security Council (ExComm) proposed several possible courses of actions including diplomacy, air strikes at missile sites and a full invasion of Cuba.²⁴ While the Kennedy administration pursued diplomatic solutions, both a full scale invasion and an air-strike were eventually rejected as the former would escalate the crisis into a conflict and the latter could not assure destruction of all threat missiles due to incomplete intelligence. Eventually, a naval blockade

(or 'quarantine' to avoid an act of war connotation) was elected as the US assessed that this was the only military option with better controllability of crisis escalation, while preventing more nuclear missiles from reaching Cuba. While the crisis was resolved diplomatically, naval force was the only viable military option available to the US with the lowest risk of escalation and provided an exit strategy for the US and the world from a major nuclear conflict. The blockade was a viable option as the USN had command of the sea and that the most likely means of missile freighting was via the seas.

"To subdue the enemy without any battle is the ... most supreme strategy."

– Sun Zi²⁵

Next, onto naval diplomacy. Besides peacekeeping and humanitarian assistance disaster relief (HADR) missions, land or air forces' deployment might be

portrayed as an act of hostility or aggression. However, a naval force is more versatile and not necessarily hostile. Turner called the *“Naval Presence mission ... the use of naval forces, short of war, to achieve political objectives.”*²⁶ Gorshkov agreed that navies *“made it possible to achieve political ends without resorting to an armed struggle... (and) instrument of policy...important aid to diplomacy.”*²⁷ Navies operate in an international medium with opportunities for both cooperation and competition. This dual possibility made navies the most suitable military component to be used as a state foreign policy instrument to meet national objectives.

In 1971, the US sent NTF74 to the Bay of Bengal to influence and prevent the Soviet-backed Indian military from further offensives on West Pakistan.²⁸ Similarly, the USSR reportedly deployed submarines to shadow NTF74 to deter the US from unilateral offensives against the Indians. There was no further escalation of the crisis after the deployment of both the American and Soviet navies to the Bay of Bengal. During the Cold War, the very existence of nuclear-powered ballistic missile submarines (SSBN) somewhere in the vast ocean and invisible, unlike Intercontinental Ballistic Missiles (ICBMs) and strategic nuclear-bombers that can be tracked, allowed both superpowers to maintain second-strike nuclear threat credibility, increasing the nations’ nuclear deterrence. Such ‘gunboat’ (albeit by submarines) diplomacy has arguably allowed both superpowers to maintain a sensible balance of both offensive defence and defensive defence, ensuring mutually assured destruction that very much prevented a nuclear war.

Conflicts

In war, superior sea power improves the chances of sea control and A2AD, providing military power with the flexibility of options for surprises and manoeuvres

via the seas. According to Hart, *“amphibious flexibility is the greatest strategic asset that a sea-based power can possess.”*²⁹ This characteristic provides strategic and operational advantages for the projection and sustenance of land or air power and strategic strike options at enemy’s Centre of Gravity.

At Operation Overlord, the Allies maintained a near total control of the sea throughout the campaign to ensure the successful crossing of the English Channel and to sustain the operations (troops and logistics) after the Normandy Landing.³⁰ Sea control was possible through the negation of the German surface fleet and the subsequent denial of the ‘U-boats peril’ in the Battle of the Atlantic. Although the Allies air superiority was also credited for the successful Normandy Landing, sea control at the Atlantic had allowed the following:

- (1) The strategic sealift of troops and equipment from the US;
- (2) Import of war materiel to the starving British industry;
- (3) Continued sustenance of land campaign, which was regarded as a war of attrition; and
- (4) Decoy operations convincing the Germans that the landing would be north of Pas-de-Calais.³¹

Nevertheless, sea power does not take the full credit for the success of Operation Overlord.

Operational manoeuvre from the sea is best exemplified by the Incheon Landing during the Korean War, where United Nations (UN) forces travelled over 1,000 miles for invasion. The UN landing cut off the North Korean’s lines of communications and recaptured Seoul, strategically reversing the situation in favour of the UN until China’s intervention. Sea

control achieved by superior sea power enabled the UN the freedom of manoeuvre, delivering strategic surprise to the North Koreans. However, this is where sea power's influence on land ceased. While the navy continued to support the land campaign, it was helpless in resisting the advance of the Chinese Army from recapturing Seoul again.

In the WWII Pacific Campaign against Japan, the navy was instrumental in enabling the 'island-hopping' strategy, bringing Japan within the reach of the US Air Force's strategic bombing. Gray argued that the campaign against Japanese merchant shipping was instrumental and decisive in bringing down the Japanese war economy.³² Japan occupied Southeast Asia for resources, especially petroleum, to feed their war economy to sustain war efforts in East Asia.³³ The US' submarine campaign against the Japanese SLOC resulted in the tremendous loss of Japanese merchant shipping and consequently imports, which had an 85% drop from 1941 to 1945.³⁴

Increasingly, the international community is cooperating to enhance global maritime security for the benefit of international trade. This includes cooperation against terrorists, pirates and proliferation of Weapons of Mass Destruction (WMD), working beyond the immediate borders of their own country for the common global good.

Japanese Navy doctrine was heavily influenced by Mahan's command at sea, with naval campaigns targeting decisive battles but neglecting *guerre de course* and defence of their own SLOCs.³⁵ Without sea control and sea denial, Japan failed to safeguard its



Launch of a Tactical Tomahawk cruise missile from the USS Stethem.

Centre of Gravity—the war economy in this total war. Nimitz concluded that, “with our sea power ..., we gave Japan the choice of surrender or slow but certain death.”³⁶ The campaign against Japanese shipping greatly affected Japanese military power generation and its turn-around capabilities.³⁷ The blockade created ‘an excess of plant capacity’ in the Japanese factories even before strategic bombing commenced.³⁸ Nevertheless, it was eventually the combination of air bombing, naval blockade and atomic bombing that coerced Japan's capitulation.

In the Falklands War, after diplomatic efforts and economic sanctions failed to prevent the war, British forces gained sea control shortly after the sinking of the Argentinian cruiser ARA General Belgrano, keeping the rest of the Argentinian fleet at bay thereafter, thereby eliminating Argentina's naval threat and ability to project air power through aircraft carriers. Although Argentina's air force continued to pose a serious threat against British ships with limited anti-aircraft defence, the Royal Navy's control of the sea

allowed air power projections to conduct air-raids and land power projections for the amphibious landing on the Falklands.³⁹ While the Royal Navy was not the key contributing factor for the recapturing of Falkland Islands, its contributions in both air and land power projection were essential for the military campaign.

In recent conflicts, the advent of precision cruise missiles launched by naval forces enabled additional strategic options. The extensive use of the Tomahawk cruise missile, launched from warships and submarines at great stand-off (over 1,000 miles), in both the 2003 Iraq invasion and the 2011 intervention of Libya's civil war, demonstrated the complementary utility of sea power and air power for destroying strategic and operational targets. This is useful to either obviate the need to commit ground forces, as seen in the 1998 attacks on terrorist facilities in Afghanistan, or to improve the success rates for the next phase of operations by land-forces (Iraq invasion).⁴⁰ Such strategic attacks are possible only with sea control through superior naval-power. This transformed how the navy could directly influence the events and outcome of a war, both at sea and on land.

Peace and Troubled Peace

The last characteristic would be the versatility of naval-forces. Maritime security is the primary mission of naval forces in peace and troubled peace (Virtuous Maritime cycle). This responsibility is important for any nation with maritime trade. Since SLOC are interconnected worldwide, sea power ensures freedom and security of trade in this highly globalised world and it is increasingly the responsibility of the navies.

A navy's strategic reach and power projection ability for expeditionary operations are expected to be the key utility of military operations in the 21st century.

Increasingly, the international community is cooperating to enhance global maritime security for the benefit of international trade. This includes cooperation against terrorists, pirates and proliferation of Weapons of Mass Destruction (WMD), working beyond the immediate borders of their own country for the common global good. For example, the Combined Task Force 151 (CTF-151), under the 25-nation coalition maritime force, was set up to counter piracy attacks off the coast of Somalia. The strong participation from numerous nations beyond the immediate vicinity of the Gulf of Aden, where CTF151 operates, signifies the strategic importance of free and peaceful maritime trade.

Sea power is more than an extension of land power. However, sea power alone does not offer all the military options for political masters to meet strategic objectives in all circumstances.

Besides ensuring maritime security, the flexibility, adaptability, responsiveness and reach of navies to project power allows the conduct of expeditionary operations

to impose good order from the sea in operations other than war (OOTW), such as HADR. Such operations contribute to international and regional stability from the sea and reconstruction after state failure or natural disasters, such as the UN mission in East Timor and Tsunami disaster relief and reconstructions.⁴¹

Strategic Utility of Sea Power

Sometimes, sea power is just a strategic 'enabler', such as its role in Operations Overlord, or a strategic tool to expand policy space before the Falklands War. At the Pacific Campaign, sea power was instrumental in strangulating Japan's war economy, leading to Japan's

capitulation. The more maritime-oriented a country, the more significant maritime power projection against it can be.⁴² For Corbett, the objective of a naval war was control of maritime communications for diplomatic, military and commercial purposes (three instruments under DIME). With command of the sea, one could:

- (1) Attack opposing forces;
- (2) Undermine war economy via blockade or *guerre de course*;
- (3) Coerce strategically.

In peacetime, sea power contributes to global maritime trade and security. Sea power is more than an extension of land power. However, sea power alone does not offer all the military options for political masters to meet strategic objectives in all circumstances.

MILITARY POWER

What about land power and air power? Numerous long lasting empires (e.g. the Mongol empire) originated from land power. The need for soldiers on the ground to capture and secure territory in most conflicts translates to the indispensable need for land power. From Odierno's observation of the evolution of strategic environment and characteristics of conflict, land forces are almost always required as their presence is necessary to prevent conflict, shape the environment and restore peace.⁴³ Consequently, the strategic and enduring utility of land power in satisfying national objectives, in the past, present and future is undisputable.

Air power strategist Douhet, a believer of *Total War*, advocated the employment of air power for strategic bombing to destroy 'vital centres' of the

enemy and break the people's will. The 1999 Kosovo war exemplified how strategic bombing achieved the North Atlantic Treaty Organisation's (NATO) objective of Yugoslavia's early capitulation. Although RAND argued that the increasing likelihood of a NATO ground invasion contributed to Milosevic's acceptance of a peace settlement, Hosmer concluded that NATO's strategic bombing created a political climate amongst both the populace and political leadership that was conducive to ending the conflict.⁴⁴

Sea power, land power and air power cannot work in isolation and fulfil all strategic objectives of a nation. From the various case studies discussed earlier, the Normandy Landings, the Pacific Campaign, the Korean War and the Falklands War, all three constituents of military power played a crucial role and had to work jointly to achieve the military end-state with maximum efficiency and minimum costs. In the contemporary world, the distinctions between sea, air and land power are increasingly blurred, with increasing strategic imperatives to bring all three constituents onto the battlefield in a cooperative and integrated fashion.

The inability of cross-service integration for joint operations would lead to the sub-optimisation of military strategies. In Operation Desert Storm, the lack of integration and mutual support between the United States Navy's Central Command (NAVCENT) and the Joint Force Headquarters led to an inability to deal with the Iraqi mine-laying operations that produced so much trouble subsequently.⁴⁵

Smith proposed that the future utilisation of the military in any political confrontation or conflict has four functions: to ameliorate, to contain, to deter or coerce and to destroy.⁴⁶ Smith argued that inter-

state industrial wars, where armed forces battled on a field, no longer exist. Instead, future conflicts would be a strategic confrontation between a range of combatants, not all of which are armies and not all of which are state actors. While it is too presumptuous to write off inter-state conflicts in future, recent trends indicate that military force is increasingly utilised in a growing spectrum of requirements from counter-terrorism, anti-WMD proliferation, peacekeeping or peace-making, resource protection to HADR, etc. In this dynamic and complex world with growing uncertainty, no single domain, i.e. land, air or sea in isolation, is capable of meeting all the strategic objectives required by the political leadership. All constituents of military power, for example, land power, air power and sea power have to be available and skilfully integrated and employed in an optimal configuration to ensure the success of meeting political objectives.

CONCLUSION

Sea power is more than an extension of land power. Sea power can be an enabler of land or air power to support a military campaign. It can also be the decisive and executive power in some circumstances. On its own, sea power is a strategic tool of choice. While sea power contributes to all four instruments of DIME, on its own, it has limitations in answering to all strategic objectives of a nation. Sea power is better classified as a strategic tool and not a strategic domain.

In Thomas' definition of fourth generation warfare, "all available networks - political, economic, social and military" – are used to impose our will on the enemy.⁴⁷ Land, sea and air power are instruments of military power, while military power is one of the four instruments of national power (DIME). The full potential of sea power can only be unleashed under the

ambit of military power, where all three dimensions of land, air and sea powers are integrated in harmony and synergised, giving a multiplier effect of military power to the nation. This provides political leaders with the flexibility of options to wield its military power, amongst the other instruments of national power to achieve desired national objectives. Thus, military power is better qualified as a strategic domain to serve national interests. 🌐

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9. Ibid. This is also described by Till (2013) as the constituents of Sea power.
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19. Based on United Nations Conference on Trade And Development's (UNCTAD) "Review of Maritime Transport 2012", world seaborne trade continues to grow steadily by 4% in 2011 to a record of 8.7 billion tons.
20. Based on the 1982 UNCLOS, Article 47, high seas are open to all states, both coastal and landlocked, where ships have freedom of navigation, and no states may validly purport to subject any part of high seas to its sovereignty. Also, based on Article 95, warships on high seas have complete immunity from the jurisdiction of any other state other than the flag State.
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ME6 Khoo Koh Giok is a Naval Warfare System Engineer by vocation. He is currently the Deputy Head of the Republic of Singapore Navy (RSN) Strategy Office. His previous appointments include Commanding Officer of Systems Readiness Engineering Centre (Weapons) and Head Operational Logistics Planning Branch 1, Naval Logistics Department. ME6 Khoo graduated from the Nanyang Technological University with a Bachelors of Electrical and Electronics Engineering (1st Class Honours) and a Masters of Engineering. He was the Top Graduate (Navy) at the 44th Goh Keng Swee Command and Staff Course.

Air Power – A Panacea to Future Armed Conflicts?

by MAJ Foo Yuk Min

Abstract:

The military force of a country usually comprises three key components: the army, the navy and the air force, all of which can stake a legitimate claim to be the most vital aspect of the military due to their various strengths. Yet, in recent conflicts, it is arguable that air power can be seen as the most crucial component of the military. With air forces around the world developing more cutting-edge technology such as precision munitions and more efficient computing processors, as well as working on new operating doctrines, the future of military engagements seem to point to the skies as the key aspect of any country's military. Through an examination of various examples of armed conflicts, this essay serves to debate if air power is really the panacea to future armed conflicts, or if land and naval forces are just as essential.

Keywords: Component; Air Power; Cutting-edge Technology; Precision; Future

INTRODUCTION

"...the future will confirm my assertion that aerial warfare will be the most important element in future wars, and that in consequence not only will the importance of the Independent Air Force rapidly increase, but the importance of the army and navy will decrease in proportion."

- General Giulio Douhet¹

In 1921, an Italian general, Giulio Douhet, published an authoritative work on his ideology on air power titled, *Command of the Air*. He argued that aircrafts were able to circumvent natural terrains and other surface impediments like land and naval forces highlighting the principle of 'The bomber will always get through'. He envisaged a total war where massive bombing campaigns, so devastating and apocalyptic,

would bring defiant nations to their knees. His description bears close resemblance to the first atomic bombing in mankind's history, twenty years later, which brought about an end to World War II (WWII). In essence, Douhet strongly believed that a decisive victory could be afforded by air power alone.²

Since then, debates on air power being the panacea to all future armed conflicts have taken centre stage. With the passing of each armed conflict, state-of-the-art technology and new operating doctrines continue to revolutionise the next military engagement. Precision munitions, improvements to sensor technology, broadband communication linkages, cheaper and faster computing processors as well as stealth technology are redefining air power's contribution to future military engagements.



The Camcopter S-100, which sports state-of-the-art sensor systems, is used primarily for surveillance.

With the passing of each armed conflict, state-of-the-art technology and new operating doctrines continue to revolutionise the next military engagement

This coming-of-age for air power has made it a force of choice. Due to its stand-off nature, flexibility and mobility, it is often used as a coercive instrument which could be ‘scrambled’ at very short notice and provide escalatory options. While the benefits of air power are appealing, its limitations must still be balanced with the strengths of land and naval forces. This paper examines the trend of political and military leadership relying on air power in pursuing their political agenda and diplomacies, highlights key reasons leading to this trend and instances where air power may not be useful. Drawing on these implications, the paper will conclude that a systematic view with a balanced approach must be taken. The merits and limitations of each service or force type have to be considered,

contextualised and integrated as a cohesive joint action plan—thus rejecting the notion that air power is a panacea to future armed conflicts.

THE EMINENCE OF AIR POWER

During WWII, air power was employed in varying degrees to take on operational roles from airlifts, surveillance, strategic bombing to air interdiction and close air support. Long range bombers were employed by both the Allied and Axis powers to conduct large scale bombing in the hope of breaking the will of the targeted populace. These bombing campaigns resulted in a body count that numbered to approximately a million.³

At sea, air power was utilised in exerting sea control. In the Atlantic, the Royal Air Force (RAF) B-24 Liberator bomber, by their sheer agility and improvised tactics, removed the German U-boat menace. The Americans employed aircrafts for bombing and sea-mining operations in the Pacific to strangle Japan, effectively ‘*reducing its imports to ten percent as compared to its pre-war days.*’⁴

Thereafter, air power has been increasingly employed for many operations. In Operation Desert Storm (ODS), we saw a spectacular display of air prowess by the US-led coalition. The campaign began with an aerial bombardment on 17th January, 1991. A staggering total of 65,000 sorties and 88,500 tons of bombs rained down on the Iraqi forces and key installations, paving the way for a short ground war on 23rd February 1991 which ended with a ceasefire some 100 hours later.⁵

Post ODS, the reliance on air power was also observed in Operation Allied Force (OAF) where the North Atlantic Treaty Organisation (NATO) began a quest to stop the ethnic cleansing by the Milošević regime in Kosovo. The campaign lasted eleven weeks. A total of 38,000 aircraft sorties expended an estimated figure of 12,000 tons of munitions throughout the whole bombing campaign.⁶ As the entire operation involved no ground forces, many air power proponents concluded that air power alone had been decisive and was crucial in making Milošević accede and sign the Dayton Accords.

Perhaps the major operational test of air power or specifically, precision air power was in the second Gulf War – Operation Iraqi Freedom (OIF). *"Ninety percent of the munitions delivered from the air rode a GPS signal, a memory map or a laser beam to their targets."*⁷ The coalition intelligence was able to geo-locate and dispatch sorties to destroy selected military units even before they could engage in any major ground battles.⁸

Riding on the success of OIF, Israel conducted Operation Change of Direction (OCD) in response to Hezbollah's incursion and abduction of two of its soldiers in 2006. The operation saw Israel placing heavy reliance on stand-off attacks by the Israeli Air Force (IAF), supplemented by the Israeli Defence Force (IDF) artillery assets. The IAF struck 7,000 targets

and flew a total of 18,900 combat sorties of which more than 60 percent were fighter sorties.⁹ Two years later, Operation Cast Lead (OCL) was launched with a series of air attacks paving the way for a subsequent air-supported ground assault, although the number of sorties flown and targets serviced were reduced significantly.¹⁰

CHOOSING AIR POWER – THE POLICY-MAKERS AND MILITARY LEADERSHIPS

What led to this trend? Why would modern militaries choose to place such emphasis on air power? Was this an endorsement that air power alone was decisive and could even win wars? To appreciate this, we should look at the stakeholders involved in the decision making process with regards to the commitment of military resources. More often than not, this decision lies with the politicians based on advice from the military leaders. So what influences their decisions?

Record's study tells us that politicians and military leaders perceive the general public as 'casualty phobic', and thus places self-constraints in the use and type of force when deciding to commence military engagements.¹¹ As the Secretary of Defense, William Cohen and Chairman of the Joint Chiefs of Staff, General Henry Shelton illustrate in their joint statement, *"the paramount lesson learnt from Operation Allied Force is that the well-being of our people must remain our first priority."*¹² Record further argued that this belief had influenced the United States (US) in its force commitments since the end of the Cold War.¹³

The Winograd's findings, after OCD, supported this point. The commission found that there was a general reluctance by the Olmert government to launch a major ground offensive so as to avoid high casualties, explaining their reliance on stand-off weaponry.¹⁴ Military leaders often share the same view. In an interview by Russell Glenn, RAND Corporation, with Brigadier General Gideon Avidor, IDF (Retired)

commented, *"I realised (there was a problem on) the first day of the war when a ... brigade commander said that his main task was to bring all his soldiers home safely."*¹⁵

Coupled with the advent of precision technology, planes can now fly at altitudes beyond that of land-based air defences and still be able to land bombs on target.

'Casualty phobia' has led politicians and even the military leadership to lean on technology as a relief from the need to answer to a populace in the face of mounting casualty count. Employment of air power and avoidance of land forces were thus better options.

But, how does air power relate to casualty reduction? Air power is largely a stand-off instrument. Coupled with the advent of precision technology, planes can now fly at altitudes beyond that of land-based air defences and still be able to land bombs on target. This is evident in the North Atlantic Treaty Organisation (NATO) and the IDF's campaigns.¹⁶ On reducing casualties, Mowbray summarised the contribution of air power in ODS by stating *"... technology (air power) helped to win the fastest, lowest casualty, and most devastatingly destructive one-sided war in recorded history."*¹⁷ Warge highlighted that the employment of precision air power in the Second Gulf War to strike at the Iraqi ground forces and other military installations yielded an amazingly positive casualty rate of close to one coalition soldier to 4,000 Iraqi soldiers.¹⁸

From a military aspect, air power does offer great appeal. Conventionally, aircrafts are able to bypass ground and naval forces, and thus are able

to strike deep within the adversary's territory. Air operations can be centrally controlled and because of its agility, it could be activated, reassigned or withdrawn at short notice.¹⁹

To illustrate this, I will draw on the works of Warden III. Warden III describes the enemy as a system of five rings comprising (from inner to outer) Leaders, Processes, Infrastructure, Population and Fielded Forces.²⁰ He argued that to defeat the enemy effectively, relevant Centres of Gravity (CG) should be identified from the inner ring outwards. He highlighted that the returns would be greater if the inner rings (i.e., leaderships and processes rather than the field forces) are targeted. In order to paralyse the adversary, parallel attacks should be conducted on various CGs so that the adversary would not be capable of *"...repairing itself, protect itself against further attacks, or making competent (counter) attacks..."*²¹ Warden highlighted that the characteristics of aerial manoeuvre allowed it to be employed against all identified CGs and was able to bring its power to bear *"simultaneously in compressed periods of time thereby producing appropriate effects with controlled destruction and bloodshed."*²² These attributes made air power superior to land and naval forces.²³

Even in counterinsurgency operations, air power could be utilised to limit 'adversary conventional options' through airborne surveillance, balance 'insurgent advantages' by having the flexibility to be able to respond to contingencies or ambush instrument via air, and even to 'gain the initiative' through the use of Unmanned Aerial Vehicles (UAVs) for situational awareness.²⁴

WHERE AIR POWER FALLS SHORT

However, these advantages do not necessitate the subordination of land and naval forces to air power.

On the subject of intolerance to battle casualty, researchers like Gelpi, Feaver and Reifler have found that while it is correct to assume that the US populace is averse to casualties, this is however influenced by their beliefs in the righteousness of the war as well as its likely success.²⁵ The over-reliance on an air-only option with an aim of reducing the number of battle deaths has often resulted in degraded military operations that manifested in the form of non-conclusive outcomes like in the case of the second Lebanon War.²⁶

From a military aspect, air power does offer great appeal. Conventionally, aircrafts are able to bypass ground and naval forces, and thus are able to strike deep within the adversary's territory. Air operations can be centrally controlled and because of its agility, it could be activated, reassigned or withdrawn at short notice.

Despite the above mentioned advantages, there are many instances where air power is limited. In the case of elusive targets or when operating in environments like mountainous or closed terrain, air power faces extreme difficulty in targeting such adversaries.²⁷ During the Vietnam War, after flying close to a million sorties, the US could not defeat the guerrillas and had to bow out.²⁸ In the First Gulf War, despite the huge amount of resources committed to target the Iraqi's Research & Development facilities, production



GPC-DFA members (from left) Mr Leonard C. Sebastian, Ms Lee and Mr Sitoh, together with Dr Maliki, being briefed on the Heron 1 UAV training simulator.

facilities and their storage of nuclear, biological, and chemical (NBC) weapons as well as the Scud missile launchers, there were no confirmed damage assessments. Both the NBC and Scud campaigns failed and highlighted that although air power can destroy targets fairly easily, it is critically dependent on very accurate intelligence.²⁹

The over-reliance on an air-only option with an aim of reducing the number of battle deaths has often resulted in degraded military operations that manifested in the form of non-conclusive outcomes like in the case of the second Lebanon War.

In asymmetrical warfare, where non-state actors are dispersed widely and utilise low technology weaponry, air power would require an even greater fidelity of intelligence in order to be effective.³⁰ During OCD, Israel was unable to defeat the Hezbollah's Katyushas surface-to-surface missiles as the Hezbollah's combatants were very competent in the techniques of "camouflage, concealment, dispersal, and co-location of its Katyushas throughout the population."³¹ Even with a persistent Intelligence, Surveillance and Reconnaissance (ISR) capability which allows for real-time targeting, the IDF had to grapple with collateral damages as these launchers embedded themselves amongst civilians. Major General (Retired) Giora Romm, former Israeli Air Force (IAF) second-in-command, highlighted that *"the lower the signature and the shorter the exposure time, the less possible it is to deal with a target from the air...the short-range Katyushas must be dealt with primarily through ground operations."*³²

Last but not least, is the issue of political will. The decision to authorise a sizeable land force in any

military engagement signifies a strong commitment to the cause. The sheer number of soldiers involved in any land warfare, which is a total potential loss of human lives, underscores this political will to press the adversary to concede.³³ Prior to OAF, in his speech to the American public, President Bill Clinton highlighted that the mission objectives were to *"demonstrate the seriousness of NATO's purpose... deter an even bloodier offensive against the innocent civilians in Kosovo...(and) damage the capacity of the Serbian military to harm the people of Kosovo."*³⁴ However, there was a mismatch between political objectives and military strategy. The non-commitment of ground forces coupled with restrictive targeting were exploited by the Serbian forces to their advantage. The Serbian army was able to disperse and conceal themselves while carrying out their ethnic cleansing atrocities. Air power hardly achieved what OAF had initially sought to accomplish. Milošević's capitulation was only achieved after NATO made major concessions.³⁵

CONCLUSION: ADOPTING A BALANCED APPROACH

This paper has put forth the argument for and against air power being a decisive force only for the purpose of having a better and more contextualised understanding of the capabilities and limitations of air power. However, for defence planning and budgeting as well as the formulation of military options, political and military leaders should adopt a broad-minded and balanced perspective.

In terms of defence planning and budgeting, a long term and holistic process must be established for the development and procurement of military capabilities so as to build a credible defence system. This allows different services to build up their distinct

operational capabilities with an understanding of how these capabilities fit into the defence system. As aptly noted by US Air Force Colonel Mace Carpenter, “Any knowledgeable air strategist understands that air power has its strengths and weaknesses, capabilities and limitations, cost and relative savings...(and) is best employed when closely integrated with other aspects of military force.”³⁶ 🌐

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MAJ Foo Yuk Min completed his Masters of Science (Management) from the Nanyang Technological University under the SAF-NTU Continuing Education Masters programme. He graduated from the London School of Economics with a Bachelors of Science in Banking and Finance via distance learning. MAJ Foo is a Signal Officer by vocation and is currently a Battalion 2IC of a Signal Battalion.

The Humane Age of Non-Lethal Warfare

by MAJ Phua Chao Rong, Charles

Abstract:

There have been centuries of conventional warfare whereby each power strives to inflict as much damage as possible, whilst selfishly sustaining their own survival and pushing for their own causes. This is notwithstanding the fact that this kind of war causes collateral damage for all parties involved as well as civilian casualties. Now, according to the author, mankind has finally started to transcend violence and accept the fact that all it causes is more violence, that is, 'a vicious cycle of conflict', making long term peace solutions impossible. The author then discusses the idea of a revolutionary age of Non-Lethal Warfare (NLW) which is a more holistic form of asymmetric and humane warfare, in which non-lethal weapons are used to defeat the enemies and to achieve a swift yet benevolent victory. This essay also assesses the pros and cons of the various aspects of humane warfare and NLW at an operational level and also assesses its overall applicability to the Singapore Army.

Keywords: Non-lethal Weapons; Limited War; Electromagnetic; Information Warfare

INTRODUCTION

Are there signs of a humane age of Non-Lethal Warfare (NLW), especially in the context of urban land operations where collateral damage to civilians can be high? Currently, the aim in war is to win, albeit with the noble intention to win with minimal casualties on both sides, especially zero civilian collateral damage, at least in theory. Hence, war appears to be moving beyond mere killing, partly due to the casualties of the Vietnam War and the two World Wars and the fear of mutually assured destruction during the Cold War. As London School of Economics (LSE) Professor Christopher Coker remarked, war is becoming increasingly more humane, at least that is the Western powers' noble intention.¹ If the 20th century is a total war including the mass destruction of society itself,

then the 21st is pointing towards a limited war, which will be more humane, not only for soldiers who fight it, but also the enemy. Indeed, the United States (US) and allied forces went to great lengths recently to ensure the safety of the soldiers and enemies alike. For example, the US lost 270 men in the Gulf War vis-à-vis the predicted 10,000. US pilots shot down in the Balkans were flown home to a hero's welcome instead of a reprimand.² The increasing accuracy of precision guided munitions has made war more discriminating than in the past, killing 1,400 Balkans during the Kosovo air bombings vis-à-vis the London bombings in World War II (WWII) which killed an estimated 40,000 people.³ Humane warfare is a response to the dehumanisation of modernity, which reduces the human to a mere death figure. Humanism seeks to counter modernity by individualising both death

and human suffering. This, augmented by the civil society's wish, has reduced the incivility of warfare. As Coker elucidated, humane warfare *"is as much to reduce the incidents in which our own soldiers are traumatised, maimed or put in danger of being killed, as it is to mitigate our own inhumanity to our enemies."*⁴ This is the moral argument.

There are strategic reasons to fight humanely. In this humane age, a victory with precision strikes and swift manoeuvres may only guarantee tactical victory. Strategic victory requires more than speed and firepower and sometimes less is more, when understood and applied correctly. Axioms of speed, surprise and firepower remain important to the Singapore Armed

Forces (SAF). However, strategically, we will need a convincing victory that displays the benevolence and decisively superior strategies, doctrine and technology of the SAF. Exercising benevolence in the war process will also be vital in determining the outcome of the peace process and demonstrates the 'big-heart' character of Singapore in the eyes of the international community. For long-term peace, as US Army War College Commandant General Robert Scales once identified, we need to ensure *"minimal casualties and collateral damage and be sensitive to domestic and world opinion"* in order to prevent any future retaliation (whether conventional or unconventional warfare).⁵ Hence, the usage of Unmanned Aerial Vehicles (UAV) and robotics (protagonists of the Virtual War) is



UAVs make great rescue tools. They can look and go places people can't, and with infrared cameras, they can sometimes see beyond what human eyes can.

necessary but can be complemented by NLW, a more holistic form of asymmetric and humane warfare, to deliver this convincing strategic victory, with minimal damage on both sides. This is especially pertinent in the future complex war environment cluttered with urbanisation and civilians.⁶

There are hitherto at least 7 categories of weapons – physical restraints, chemical weapons, electromagnetic weapons, biological weapons, acoustic weapons, electromagnetic weapons and information warfare.

NON-LETHAL WARFARE

As Alvin & Heidi Toffler argued, *“non-lethality is ... an intermediate phenomenon, an arena for contests where more outcomes are decided bloodlessly.”*⁷ However, NLW in itself is a contentious term. Without dwelling into the semantics of non-lethal and less-lethal, non-lethal weapons are hereby defined as *“weapons designed to function in a manner that degrades the capabilities of materiel or personnel and yet avoid unintentional casualties.”*⁸ There should be few fatalities to humans excluding accidents and/or misuse and have relatively reversible effects on materiel and personnel. As early as 1959, former Chief of US Army Chemical Corps Major-General Casey suggested the development of psycho-chemicals to wage war without killing the enemy. It was only in 1996 that the policy paper on non-lethal weapons was signed.⁹ There are hitherto at least 7 categories of weapons – physical restraints, chemical weapons, electromagnetic weapons, biological weapons, acoustic weapons, electromagnetic weapons and information warfare. Rather than giving a technical capability narrative, this essay will do a horizon scanning of selected capabilities and discuss their utility at the strategic/

operational and operational/tactical levels and their potential relevance to the SAF. The essay will end with an assessment of the overall applicability of humane warfare and NLW to the SAF.

STRATEGIC/OPERATIONAL – INFORMATION & ELECTROMAGNETIC WARFARE

At the strategic/operational level, one can expect Information Warfare (IW) to play a vital role, which will represent a growth area for Signals, Intelligence, Security and IW (including Information Operations/Information Management) practitioners in the SAF. As retired US Army Colonel Alexander commented, *“a concerted IW attack could be devastating and a quick recovery is not assured.”*¹⁰ The US Air Force Air Intelligence Agency defines IW as *“actions taken to preserve the integrity of one’s own information systems from exploitation, corruption or destruction while at the same time exploiting, corrupting or destroying an adversary’s information systems.”*¹¹ Indeed, the definition is so broad that it *“covers all human endeavor.”*¹²

The flip side of digitised militaries is its vulnerability to IW. At the strategic level, IW can come in the form of Computer Network Defence, Attack and Exploitation.¹³ Networks can be exploited by inputting false information and/or information blockade (denial) by the cutting/jamming of ground-based communications. Viruses can attack the enemy’s information systems. The high availability of user-friendly hardware and software to create viruses’ aids budding terrorists, thus further threatening our homeland security. With more militaries becoming reliant on Commercial Off-The-Shelves (COTS), it further aggravates this threat. For example, a stealth virus could be implanted during the manufacturing process, only to be activated by electromagnetic signals later, thus corrupting high-tech weapon systems during war.

To the extent that IW equates to media-operations/perception management, a sophisticated IW campaign at the grand strategic level and in collaboration with major international media, can even persuade the enemy's leadership to abide by one's will. The swaying of international opinion is a force to be reckoned with. This is asymmetric warfare—the least risky and most cost-effective way of influencing the will of the public and altering the enemy's policies, while avoiding defeat by superior conventional military forces; something Sun Tzu would have agreed with.¹⁴ With technology and increasing democratisation of countries, we no longer live alone but in a community of states where perception counts and must be managed.¹⁵ At the more operational/tactical level, some militaries term it Psychological Operations (PsyOps) to present the enemy with a false picture of the developing battlefield through the insertion of wrong information into the enemy's information systems to undermine their *"organisation, structure, methods and validity of knowledge."*¹⁶ Indeed, the target of IW is always the human mind, which can be deceived and swayed by emotion. IW is a double-edged sword; SAF needs to continue to look into the protective procedures and psychological resilience of its soldiers (defensive IW) whilst embarking on her ongoing quest for offensive IW.

Beyond Electronic Warfare, electromagnetic weapons are the nemesis of the network-based militaries and this is something that Signal practitioners might be looking into next. Non-nuclear high-energy electromagnetic pulse (EMP) generates one or more very intense pulses of electromagnetic energy that penetrates equipment to degrade or destroy sensitive electronic circuitry.¹⁷ This coupling process is executed either via the front-door (energy enters via an antenna or other path that is exposed to the outside and leads directly to the target device e.g. in Operation Desert

Storm) or the back-door (the electromagnetic energy travels to the target indirectly, e.g. through electrical cables, poorly shielded interfaces or even holes in the walls of the system) possibly with special operations support.¹⁸ This happened to the Iraqi Air-Defence system at the onset of Operation Desert Storm when the *"US's AGM-86 Air-Launched Cruise Missile detonated within ten metres of protruding antennae, releasing a huge EMP that 'fried' the electronics of Baghdad's Air-Defence Command Centre."*¹⁹

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The Desert Storm example epitomises Sun Tzu's advice on cheng/chi (indirect approach) for maximum shock and non-violent attacks in the order of priority, the enemy's strategies, alliances, soldiers and worst resort, walled cities.²⁰ By not having any C4I support, the enemy is too isolated to execute any wise strategies and is uncontactable to its diplomatic allies and subordinate units. Furthermore, imagine the psychological impact when a massive EMP cripples the enemy nation's civilian infrastructure (telecommunications, financial, transportation and energy distribution systems), whether temporarily or permanently. With greater reliance on Integrated Knowledge Command and Control (IKC2), the 3G SAF should also embark on a long quest to develop more reliable protective measures, beyond the costly shielding, against EMP. COTS is especially vulnerable to EMP attacks and the massive investment on IKC2 technology is counter-productive if it does not even survive the first wave of backdoor EMP attacks. Research into EMP and counter-EMP should be simultaneous and immediate.

OPERATIONAL/TACTICAL – THE REST

At the operational/tactical level, physical restraints, low kinetic impact, EM, acoustic, chemical and biological weapons have both anti-materiel and anti-personnel applications and they offer new growth areas for Engineer and Signal practitioners.

Physical restraints present an exciting array of options for Mobility/Counter-Mobility (MCM) and non-lethal offensive operations. The modern 'Roman Gladiator' (net and trident), armed with high strength, lightweight, synthetic fibre nets coupled with advanced projection techniques, can ensure an accurate and non-lethal capture of the enemy soldier at substantial range (Netgun, within 45 feet).²¹ The US Army Armaments Research and Engineering Development Command (ARDEC) have both anti-personnel (for single or multiple human targets at longer ranges) and anti-materiel weapon applications.²² The infantry/guards can use 'smart' anti-personnel nets, which can sense struggle and administer a shock when the captured person attempts to escape.²³ Thanks to Los Alamos National Laboratory, militaries can now emulate 'Spiderman', forming net-like entanglement on enemies.²⁴ Mine clearing is much easier using a net laced with 'det-cords', which detonate all the mines when mechanically dispersed over a suspected minefield.²⁵ Similarly, air-defence can use Miller's 'Birdcatcher' device to detonate an incoming missile before impact point.²⁶ For counter-mobility operations, clear plastic caltrops (four-pointed scatterable spikes) may be dispersed to deflate the enemy vehicles' tyres or even detonate the pre-planted explosive via radio signal.²⁷ The more advanced 'Silver Shroud' ballistically-deployed polymer film can literally wrap up a targeted vehicle and is especially effective for counter-armour operations since the tank turrets will be stuck.²⁸ When aptly employed on key targets, physical restraint techniques can yield operational

advantages for Divisions, Brigades and even Battalions at the warfront.

Low kinetic weapons present a revolutionary array of non-lethal infantry/guards weapons for 3G SAF. Originally used by the British against Irish rioters in the 1970s and later by the Israeli military and police operations, rubber/plastic bullets can be fitted onto M-16 rifles and fired to incapacitate enemy soldiers without breaking bones, only causing bruises.²⁹ The vehicle-mounted, multiple-cartridge version is capable of 1,400 ballistic rounds that can be used for area anti-personnel targets.³⁰ Byers' Special Purpose Low Lethality Anti-Terrorist shells can blast a lock of the door without penetrating anything within the room.³¹ Hence, low kinetic munitions provide a good alternative to lethal rounds; they can be fired from existing weapons although the fire range needs to be improved to provide the benevolent SAF soldier a tactical safety distance.

Some electromagnetic weapons can also reap tactical yields. Electronic stun guns can be useful to incapacitate an aggressive soldier during battle. Tasers use compressed air to shoot electrical darts, which delivers a 25,000-volt shock causing loss of neuromuscular control in the aggressor.³² Although widely used by the police, there is potential usage in the military/peace support operations when the effective range of the weapon is extended. In addition, light, with as much as 6 million candlepower – can prevent an attacker from seeing the source of the beam and prevent any successful aimed shots from the enemy.³³ Illuminating grenades, amongst other techniques, can produce flameless chemical light, temporarily blinding the enemy for several minutes.³⁴ Hence, there is ample time to literally capture the enemy with minimal resistance. Adding to the list, Battlefield Optical Munitions are direct energy weapons that dazzle the targeted optical sensors temporarily and can be used



An EMP simulator HAGII-C, being tested on an American E-4 aircraft.

by Air-Defence weapons against incoming aircraft with optical-tracking missiles, as well as by infantry/guardsmen against enemy heavy weapons with target acquisition and tracking optical sensors.³⁵ These weapons maximise the electromagnetic spectrum to expand the arsenal of anti-personnel and anti-materiel non-lethal weaponry.

When aptly employed on key targets, physical restraint techniques can yield operational advantages for Divisions, Brigades and even Battalions at the warfront.

Acoustic weaponry is an ancient tactic that Alexander dated to the time of Joshua and the battle for Jericho.³⁶ It has the advantage of incremental applications with intensity increasing until compliance and can be efficiently transmitted through fog, smoke and dust. With advanced beam steering techniques (accurate directionality) and a phase-array system (reducing size), acoustic weapons have immense potential in anti-personnel and anti-materiel weapons. According to Soviet research, high intensity infrasound can induce sensations of panic and impairment in tracking ability, peripheral vision and choice-reaction time in humans. At 7 Hertz, the Soviet scientists reported difficulty in mental

activities and precision work. In addition, ultrasound was reported to create fatigue and general weakness.³⁷ Employing electro-neurophysiology, Dickhaut created Pulsed Periodic Stimuli (PPS) that caused perceptual disorientation in targeted individuals and importantly, it uses minimal intensity.³⁸ Anti-materiel acoustic weapons can destabilise critical metal elements causing the ineffectiveness of enemy equipment.³⁹ The most important advantage of acoustic weapons is its stealthiness; the enemy will probably be affected without even knowing the source!

The biological and chemical weapons discussed here should not be confused with those banned under the Biological Weapons Convention (BWC) and Chemical Weapons Conventions (CWC). These weapons are strictly used to immobilise the enemy troops/vehicles during battle. Anti-materiel chemical agents such as super-acids can degrade tyres or, coupled with a caltrop (see physical restraints), can slowly delaminate tyres over less than 50 miles.⁴⁰ Different super-caustics (aggressive solvating agents) can be used to destroy a computer board circuitry, aluminium, glass optics, engines, filters or basically any targets.⁴¹ As this indirect approach promises, there is no need to engage the enemy vehicles face-to-face. Direct viscosification agents can make fuel clogs up the fuel pumps, pipes and carburetors. Of use for counter-Armour operations, adhesive foams, super-acids and special paint-splattering bullets can etch the optics enough to blind a tank.⁴² Conversely, one can spray super-lubricant on the ground, making movement impossible. Anti-personnel chemical agents include high-pressure water cannons, tear gas, foam technology and stink bombs amongst others. They present a faster way of overcoming area targets with benevolence vis-à-vis the low kinetic impact weapons (fairly point-targets). Of course, there are more powerful chemicals that induce sleep (soporifics),

drowsiness (ozone cannon) and disorientate people (psychoactive drugs). However, these may involve ethical issues contravening the CWC.

Anti-personnel biological weapons such as Ebola virus and Ricin are highly contentious and definitely contravene the Biological Weapons Convention. Biological warfare is defined as *“the use of disease to harm or kill an adversary's military forces, population, food or livestock.”*⁴³ From the perspective of benevolence and strategic utility, anti-materiel biological weapons have more to offer. Biological agents can degrade the chemical bonds (plastisers) of the critical sub-components. With minimal effort, a small amount of damage can cause the malfunction of the entire system; this is a good return of investment. Microbe attacks can result in *“the acceleration of corrosion, degradation or decomposition of roads and aircraft runways”, sufficient to slow down an enemy's advance.*⁴⁴ In all, NLW presents a revolutionary approach to war with minimal casualties but no less tactical/operational success and strategic victories.

STRATEGIC IMPETUS TOWARDS HUMANE WARFARE & BENEVOLENT WARFARE

Humane warfare does not mean no war. The SAF must always be prepared for the worst-case scenario – war. In unconventional war, if we retaliate against the terrorists in the same way using unscrupulous methods to kill and harm soldiers and citizens alike, we lose our moral high ground and become terrorists ourselves; our retaliation further fuels the grassroots support for such terrorists.

As keepers of the peace, we may need to fight benevolently to win the hearts and minds of the people. The same logic can be argued for conventional warfare. The domestic populations of both countries will want minimal casualties and will surely react negatively against their government, should news

outlets like 'CNN or Channel News Asia' catch them in any acts of cruelty—the US-Vietnam war is a case in point.

The new strategy may try to be as moral and humane as possible in the conduct of war. While Coker highlighted that humane warfare is largely a Western phenomenon, an insight into selected Asian classics of wisdom suggest an East-West consensus on humanism.

The approach towards war is important in determining the strategic victory. NLW can be seen as a humble attempt to creatively adapt Sun Tzu's *Art of War* to 21st century warfare—the indirect approach to war at a grand-strategic level. As Sun Tzu said, *"attack in the order of priority, the enemy's strategies, alliances, soldiers and worst resort, walled cities."*⁴⁵ It is strategically unsound to win a war with maximum casualties on either side. Any loss of lives will breed

hatred and hence retaliation resulting in a vicious cycle of conflict. Strategically, countries will still want to win wars, whether it is the conventional wars against states or unconventional wars against terrorists and/or guerillas. Hence, NLW can help shape the way war is fought by achieving the ideal of 'less physical destruction, more strategic victory'. As Coker analysed, this also highlights the peaceful Chinese notion of harmony, non-violence and minimal use of force in Sun Tzu's treatise.⁴⁶ The mere usage of non-lethal weapons is both strategic and symbolic. Even the enemy troops will be awed by the goodwill and peaceful intentions of our forces. Whether the captured enemy soldiers will eventually surrender or even divulge their own forces' secrets, in the hope for a shorter war, is unfathomable; but suffice to say, the result is a strategic victory and a workable long-term peace reconciliation process.



Singapore's MRF (Medical Response Force) is well equipped to deal with potential Biological and Chemical threats to our nation.

In a rational age of today, the Confucian dictum, *“the benevolent has no equals”* (仁者无敌) still rings true in various manifestations.⁴⁷ To a great extent, it is the people, as a collective, who determine the strategic outcome of a war. Whether in conventional or unconventional wars, NLW firstly wins the moral high ground. This benevolent means to war garners international support (multilateral bodies, fellow countries, other international organisations of sufficient repute and media) on one’s side, especially when one is on the defensive side. If defeated, the loser will also feel convinced of one’s capability and moral ground; the chances of rekindling such conflicts will be much reduced since less seeds of hatred are sown. Hence, perception management is important and NLW delivers that comparative advantage.

There are also seemingly concurrence for this peaceful non-lethal approach to war amongst other faiths and philosophies. Both Christ and Buddha taught to *“counter hatred (war) with love and compassion”*.⁴⁸ Gandhi’s ‘oppositional non-violence’ embodies the Hindu notions of peace. Islam, by definition, means peace. Most importantly for the SAF, NLW is very much in line with Singapore’s pragmatic philosophy.⁴⁹ If pragmatism is *“considering what effects of a conceivably practical kind the object may involve”*, then NLW does exactly that to ensure a decisive strategic victory and long-term peace, should a war ever break out.⁵⁰

REALITY CHECK - WHITHER BURDEN OF BENEVOLENCE?

However, there needs to be a reality check. Benevolent or humane warfare is difficult to implement in practice. How many people have the magnanimity of Jesus Christ, Buddha Gautama, Prophet Mohammed or any of their accomplished disciples? Indeed, it is easier to kill than to save and win the heart of the ‘other’ side. Jet Li’s role in the Mandarin movie

Fearless (霍元甲) best illustrates this difficulty: A young and well-skilled martial exponent, hot-tempered Jet Li, as Huo Yuan Jia (霍元甲), fought hard to kill a fellow martial exponent over a trivial dispute. Remorseful after losing his family consequently, Huo became a recluse only to return a patriotic and benevolent fighter. His battle against opponents from 8 nations in 1910 demonstrated the challenge to win his opponent over as against to merely winning him. It takes a lot more skill and energy on Huo’s side to ensure his opponent, the British Boxer Hercules O’Brien, is defeated wholeheartedly amidst also saving O’Brien’s life. This requires superior moral character, perseverance and goodwill for long-term peace. Nonetheless, benevolence is benevolence; the world has eyes to judge.

NLW can potentially deliver the strategic victory without the international political backlash and signals the benevolence of a small but developed nation concerned with the long-term regional peace and security.

Nevertheless, facets of humane warfare and NLW are relevant to the SAF. Humane warfare reminds the SAF to consider the media angle and international opinion in war and such notions of humane warfare will put Singapore in good stead after the war. NLW, in its purist sense, represents a challenge to conventional thinking of lethal warfare and propounds that NLW too can make a significant impact in war. In fact, the unknowing disabling of equipment and personnel may be even more effective than direct strikes because such NLW attacks (e.g. EMP, anti-personnel and anti-materiel chemical, biological and even acoustic weapons) may be even more silent, more un-attributable, and hence unavoidable.

CONCLUSION - NLW AS SUPERIOR STRATEGY-TO-BE

In whichever form or weaponry, NLW is a useful approach to warfighting that seeks to preserve rather than eliminate lives and in the course of doing so, is by no means less deadly in determining the outcome of war. The nature of war has not changed. It remains, to a great extent, true to the Clausewitzian dictum—“*war as an extension of politics*”, for reasons of greed, hatred and anger.⁵¹ But “*to impose one’s will does not mean the physical destruction*”, as Clausewitz also clarified. Indeed, in this globalised age checked by international public opinion, the un-finessed usage of force can be counter-productive.⁵² To healthily compete in a military arena but not to savagely kill and destroy, NLW will be the pacifist model of war for many decades to come as the world progresses towards a humanistic civilisation. For states like Israel, NLW is a superior strategy-to-be that can help to slowly placate the centuries of hatred from mutual killings and misunderstandings. NLW is also a useful strategy-to-be for states like Singapore on a defensive posture, always deterring but ever ready to achieve a swift and decisive victory, should security be compromised. It can potentially deliver the strategic victory without the international political backlash and signals the benevolence of a small but developed nation concerned with the long-term regional peace and security.

Notwithstanding, in reality, war is still blind and players will not play by any rules of benevolence. Till then, when the rules of NLW are universally practised and regarded as sacrosanct, the SAF should actively maintain its lethal arsenal whilst complementing it with useful non-lethal weaponry and competencies that can deliver an equally potent edge in a cluttered war environment. 🌐

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26. Ibid, 83.
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MAJ Phua Chao Rong, Charles is currently doing his PhD at Lee Kuan Yew School of Public Policy (LKYSPP) on a NUS Lee Kong Chian Graduate Scholarship. An Intelligence Officer by vocation, he has also done a Signals PC tour in the Armour Formation. An Academic Training Award (Overseas) recipient, he holds a Masters of Science (Research) with Merit and a Bachelors of Science (2nd Upper Honours) in International Relations from the London School of Economics and Political Science (LSE). He is a recipient of the Global Sachs Global Leaders Award (2004) for academic and leadership excellence at LSE, and also received the HSBC Youth Excellence Award (2005) for youth leadership and community service from President S. R. Nathan. Having won 12 essay awards including First Prize in the 2013/2014 Chief of Defence Force Essay Competition, he has also published in the Royal United Services Institute (RUSI) Journal, Military Review, Institute of Policy Studies (IPS), amongst others. He is currently the Editor-in-Chief of the Asian Journal of Public Affairs, Assistant Editor of Comparative Public Policy Series, Cambridge University Press and is the President of the Association for Public Affairs.

The Malayan Emergency (1948-1960) – Can Lessons be drawn for Present Day Situations?

by MAJ Lim Yu Sing

Abstract:

Following the success of the British insurgency during the Malayan Emergency, there has been a countless host of works aimed at uncovering the ‘lessons’ to be learnt from their victory in Malaya. This essay explores whether the lessons learnt from the case of the Malayan Emergency, are indeed a practical template to base future counter-insurgency (COIN) campaigns on or, if the British Army’s success was uniquely contextual to the situation in Malaya at the time; that it cannot be replicated in other COIN campaigns since each insurgency has a distinct political and socio-economic character. The essay continues with an in-depth study of the situation during the Malayan Emergency, in an attempt to find out what the unique factors were that led to their success, what can and cannot be used as a ‘template’ for other COIN campaigns.

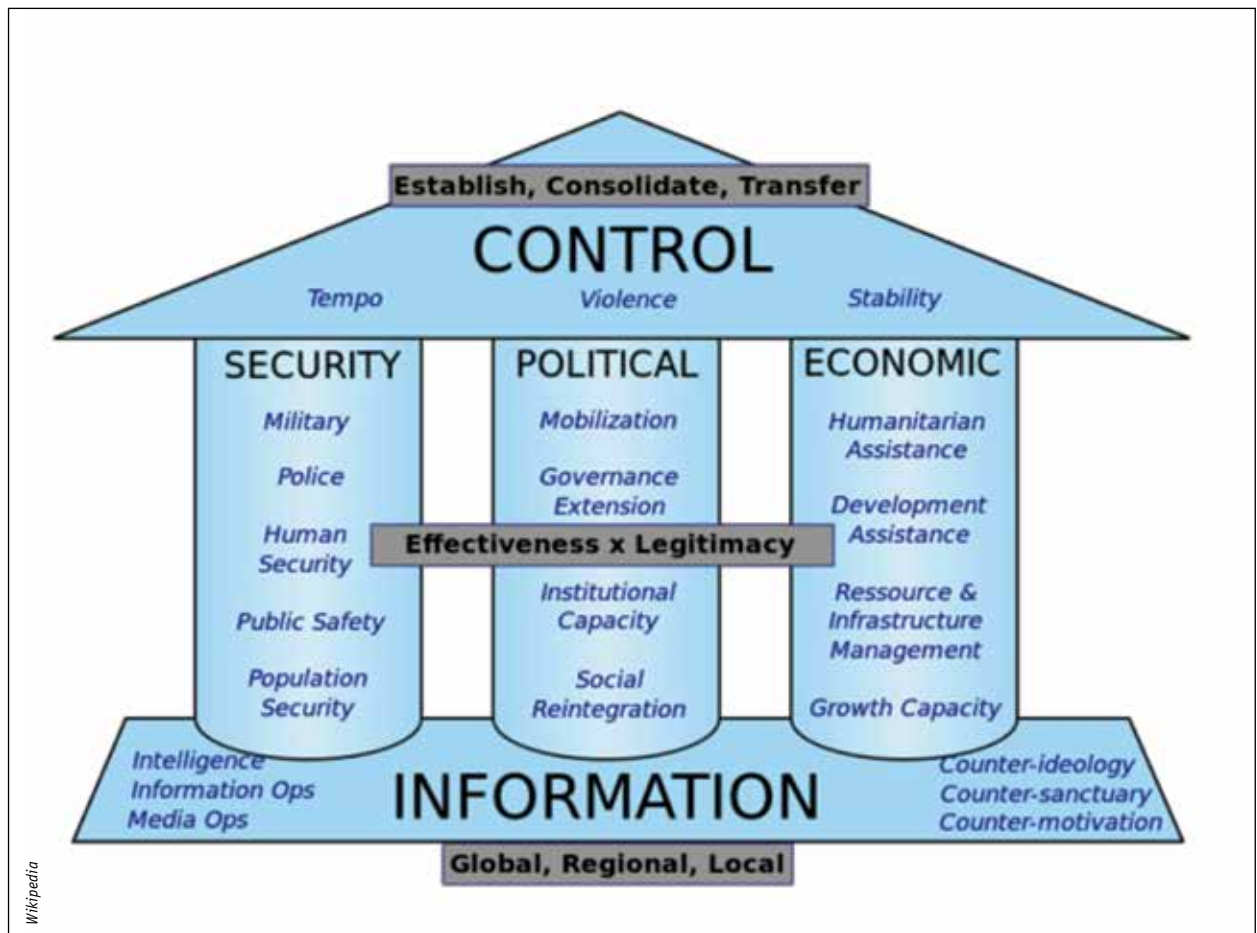
Keywords: Counter-Insurgency; Terrorism; Case Study; Strategic Warfare; Anti-Guerilla

INTRODUCTION

In this essay, I will discuss the view that the Malayan Emergency is often viewed as a paradigm from which ‘lessons’ can be drawn for present day COIN situations and attempt to validate the prevalence of this assumption through literature review. I will then contend that the prevalence of such a view constitutes a propensity by COIN ‘practitioners’ and ‘experts’ to ‘template’ the British experiences in the Malayan Emergency and, that ‘templating’ has shown to be ineffective for the United States (US) and Britain in subsequent COIN campaigns because the ‘lessons’ drawn from the British success in the Malayan Emergency are fundamentally not universally enduring COIN maxims, independent of time, place and situation. Since all kinds of COIN ‘lessons’ have been drawn from the Malayan Emergency, all of which cannot possibly be covered in this essay, I will use two of the most

common lessons of the Malayan Emergency era that pervades COIN discourse today—population control and hearts and minds—to support my argument. I will first use population control to contend that its operational effectiveness was uniquely contextual to the confluence of demography socioeconomics and geography of Malaya at that time and that it cannot be replicated in other COIN campaigns. I will then use hearts and minds to argue a wider point that the ‘lessons’ from the Malayan Emergency era cannot be reasonably seen as universally enduring COIN maxims because there is no universal understanding of what is meant by the British success and the lessons.

In an introductory excerpt to an academic piece entitled *“Extracting Counterinsurgency Lessons: The Malayan Emergency and Afghanistan,”* the Royal United Services Institute noted, *“British success in Malaya*



The three pillars of COIN – Security, Political, Economic, support the overarching goal of Control, but are based on Information.

appeared to show how an insurgency could be defeated by Western-led forces.” The campaign was plundered for ‘lessons’. Bennett’s observed that “...drawing lessons from the Malayan Emergency is a familiar practice in COIN studies. Admiration for ‘minimum force’ and ‘winning hearts and minds’ redounds.” Ampssler similarly notes, “the Malayan Emergency is still regarded as the shining paradigm of how to properly wage a COIN campaign and Templer’s emphasis on ‘hearts and minds’ established in

military circles, a fixation with these operations.”³ A survey of the vast amount of literature on the Malayan Emergency and COIN would support these views and reveal that the Emergency is indeed often viewed as a paradigm from which ‘lessons’ can be drawn for present day COIN situations. Given that it would be impossible to account for every piece of intellectual work on COIN that has either explicitly or implicitly built its arguments on ‘lessons’ drawn from the British

Overall, this prevalence of treating the Malayan Emergency as a paradigm from which ‘lessons’ can be drawn for present day COIN situations, constitutes a propensity by COIN ‘practitioners’, ‘experts’ and ‘commentators’ to ‘template’ the British experiences in the Malayan Emergency.

'successes' in the Malayan Emergency, only a sample of the works will be highlighted.

One of the most well-known pieces of writing to draw 'lessons' from the Malayan Emergency is found in Robert Thompson's book entitled *'Defeating Communist Insurgency'* in which five COIN 'principles' are prescribed.⁴ Against the backdrop of the United States' (US) involvement in Vietnam in the 1960s and 1970s, a series of US Department of Defense sponsored works that drew 'lessons' from the Malayan Emergency also emerged.⁵ For example, Komer drew five 'lessons' from the Malayan Emergency for the US involvement in Vietnam and concluded, *"the case of Malaya...is instructive as an example of how another Western power dealt with a serious insurgency... successfully..."*⁶ More recently, Nagl concluded with the 'lesson' that the US Army had to move away from the rigid practice of doctrine to adopt the British Army's organisational culture of learning and adaptation which had brought about its 'success' in the Malayan Emergency COIN campaign.⁷ Ucko also drew 'insights' from the *"startling results witnessed in Malaya"* to comment on the US Marine Corps' COIN concept of 'Distributed Operations'.⁸ Significantly, the 'lessons' from the Malayan Emergency also abound in the US and French COIN Doctrine.⁹ Malayan Emergency history scholar Karl Hack also weighed-in on the contemporary COIN discourse as he highlighted 'underlying principles of British success' in Malaya that he thought would be applicable to the International Security Assistance Force (ISAF) COIN campaign in Afghanistan.¹⁰

In another piece, he 'periodised' the Malayan Emergency into three phases and suggested that this would yield *"differently weighted list of lessons"* because different phases required different policies: *"any COIN model that ignores this is likely to cause serious problems for at least some stages."*¹¹ A host of other works has

also referenced the Malayan Emergency for COIN 'best practices' and 'lessons'.¹² The view that the Malayan Emergency is indeed often viewed as a paradigm from which 'lessons' can be drawn for present day COIN situations, is perhaps best accounted for by Hack's observation that, British success in the Emergency has consequently been studied for COIN 'lessons', which can be categorised under the headings of:

- (1) 'population control';
- (2) persuasion, or 'winning hearts and minds' through using minimum force, political concessions, and social provision ;
- (3) command, unified and dynamic leadership; and
- (4) the need for security forces to become effective *"learning organisations."*¹³

Overall, this prevalence of treating the Malayan Emergency as a paradigm from which 'lessons' can be drawn for present day COIN situations, constitutes a propensity by COIN 'practitioners', 'experts' and 'commentators' to 'template' the British experiences in the Malayan Emergency. However, it is clear that this will not work because 'lessons' drawn from the Malayan Emergency are fundamentally not *"universally enduring COIN maxims independent of time, place and situation."* It is hence not surprising that despite having 'learnt' from the Malayan Emergency COIN campaign, the US still 'failed' in COIN in the Vietnam war while even the British, despite having 'succeeded' in Malaya and widely seen as being COIN 'experts', had 'failed' in Iraq after infamously losing control of Basra between 2006 and 2008.¹⁴ In fact, the 'templating' of Malayan Emergency era 'lessons' reflect Eliot's point that *"all too often COIN is viewed as a toolkit of tactics or a grab bag of miscellaneous past experiences in dealing with insurgencies... the problem lies with these historical compendiums of COIN experiences is*



Members of the Malay Regiment inspect equipment, supplies and documents captured in a raid on a communist terrorist jungle camp, circa 1949.

that they miss the most important point—that each insurgency has a distinctive political and socioeconomic character... in fact it detracts from understanding the crucial underlying political issues central and distinctive to each conflict.”¹⁵

Echoing Eliot’s views, I will contend that the measures applied by the British were dependent on the confluence of specific demographic, socioeconomic and geographical conditions of Malaya at that time and cannot be replicated in any other COIN campaigns to reproduce the British ‘success’ in Malaya. One can also look at it from the other side of the coin (no pun intended) and argue that the demographically, socioeconomically and geographically ‘misplaced’ nature of the Malayan communist insurgency had contributed to the ‘success’ of the British COIN. To

put this into perspective, I will analyse ‘population control’—one of the most common ‘lessons’ of the Malayan Emergency era that still pervade COIN discourse today—to show how its operational effectiveness was dependent on the confluence of unique contexts.

Although ‘population control’ or ‘spatial and population control’ of the Chinese masses had prompted more information-sharing and cooperation as well as enabled better identification and isolation of communist sympathisers to literally starve the insurgents into ‘defeat’, its operational effectiveness was dependent on the following conditions—demographically, the British did not have to deal with complex racial or religious dynamics and only had to separate an organised and ‘ethnically homogenous insurgency’ from the population.¹⁶ In the same vein, ‘population control’ worked well because the ethnically Chinese-based insurgency were already physically separated from the larger population as they attempted to emulate the Maoist ‘blueprint’ of a rural-based revolution in Malaya. In fact, they could only depend on a relatively small material support base since only 30% of Malayan Chinese lived in the rural squatters.¹⁷

However, given a different set of demographic, socioeconomic, geographical and political contexts during the Vietnam war, the ‘lesson’ of ‘population control’ did not work when the US ‘templated’ it through the ‘Strategic Hamlet resettlement programme’.

Moreover, the non-Chinese had also thought that the Malayan Communist Party was “too foreign in nature to even offer a sense of security, while the initiation

of widespread terrorist acts in 1949 had rapidly eroded whatever base of support the Communist Malays had hoped for."¹⁸ Not only was the insurgency limited in its appeal to the Malaya population along racial lines, its anti-religion communist ideals also presented a cultural divide to the Muslim majority of Malaya.

'Population control' also depended on the erosion of the basis of the populations' grievances. In this, the rural Malayan Chinese had less reason to support the communists once the basis of their marginalisation grievances were eroded by 1953, as they were given land ownership, citizenship, voting rights and a larger part in policing. Finally, whatever measure of anti-colonial nationalist appeal the insurgents had with the broader Malaya population was nullified when the British made it clear that Malaya would be granted independence by 1957.

*In terms of socioeconomics, 'population control' also worked in Malaya because of the limited appeal of the insurgency's class-based rural ideology. Not only did the insurgents not have the support of the wider working class of Malaya as they had "not courted enough of a united front with those below the wealthiest bourgeoisie, the Malayan Chinese also had a fundamental materialistic outlook that the British could exploit through what Hack sees as a complementary system of rewards and coercion aimed at 'persuading minds' in 'population control'."*¹⁹

The marginalised peasant Chinese population were already living from hand-to-mouth in the jungle fringe squatters of Malaya and being sojourners, had no particular rootedness to the land they lived on.²⁰ Coupled with collective punishments, curfews, food control and surveillance looming over the Chinese population during the Emergency, it would be reasonable to argue that it was an economically rational choice for the Chinese to be receptive to the

resettlement of the 'Briggs Plan'.²¹ They had nothing more to lose and much to gain from the generally better amenities like town halls, basic schools and medical dispensaries offered by the 'New Villages'. As Miller notes, *"the Chinese were won... by way of their pockets... by offering them better economic prospects"*.²² Given the 'materialistic' concern of the Chinese, Ramakrishna and Hack have also shown that offers of monetary rewards for intelligence, targeted propaganda with ex-insurgents, showing signs of socioeconomic improvements and more liberal amnesty terms were effective in 'persuading minds'.²³ Moreover, the introduction of 'White Areas' by 1953 also worked towards 'persuading minds' as Emergency restrictions were lifted to reward communities that had low levels of insurgent activity.

Operational effectiveness of 'population control' also depended on the fact that the communist insurgents had no alternatives to material support. The geographical isolation of the Malayan peninsula had a part in ensuring this.²⁴ First, with 75% of the Malaya jungle terrain uninhabitable, this Maoist 'blueprint' of a rural-based revolution in Malaya presented serious and unique problems for the insurgents since *"the further [they] retreated into the jungle to avoid capture, the further they ran from attainable supplies and munitions."*²⁵ Moreover, the peninsula geography made it difficult for the Malayan communist insurgency to receive external material support, especially since the British had the cooperation of the Thais to seal off the border.²⁶

Overall, 'population control' was shown to be operationally effective by 1952 as the communist insurgent leader Chin Peng recalled later in his memoirs that *"[the communists] were really feeling the heat of the New Villages [and that although they had, at that time] a whole haversack of money... [they*



The US army evacuating the Khe Sanh Complex in Vietnam on 1st July, 1968.

couldn't] get a bit of food", since they could not establish a durable base of operations that was safe and could feed the large insurgent contingent.²⁷ He also lamented that they did not receive "a single bullet from outside Malaya" during the period.²⁸ However, given a different set of demographic, socioeconomic, geographical and political contexts during the Vietnam War, the 'lesson' of 'population control' did not work when the US 'templated' it through the 'Strategic Hamlet resettlement programme'.

Amongst the many reasons, top of which was the fact that the corrupt Diem government had little legitimacy with the masses in the first place, control was also not possible because the communist insurgency in Vietnam was not limited by ethnicity.²⁹

Furthermore, "although more than four million Vietnamese peasants were relocated in the US Strategic Hamlet resettlement programme... most were forced to leave ancestral lands, which held personal and even religious implications for them; thus the programme was doomed to failure."³⁰

Finally, whatever measure of anti-colonial nationalist appeal the insurgents had with the broader Malaya population was nullified when the British made it clear that Malaya would be granted independence by 1957.

If we were to look at the ongoing civil strife in Syria, we need not even undertake the complex task of comparing the intricate demographic socioeconomic and political contexts of Malaya with Syria to see that the COIN ‘lessons’ drawn from the Malayan Emergency era would be useless to Bashar al-Assad. At the simplest level, unlike the Malayan communist insurgency that was organised and could be targeted and affected by measures like ‘population control’, the ‘insurgency’ in Syria is as diffused as it is unorganised. Comprising ‘men with guns’ who are united by nothing more than the fact that they have guns and are firing them in the same direction, they cannot be targeted, much less addressed with any COIN ‘maxim’, even if it existed.³¹ Moreover, unlike the communist insurgency in Malaya that was in part starved into ‘defeat’ because it had no material support from outside, the Syrian ‘insurgency’ is fuelled by the material support channeled from the “*meddling Saudis and Qataris*.”³²

Beyond the fact that the ‘lessons’ of British ‘success’ is uniquely contextual to the confluence of demography, geography and socioeconomics of Malaya at that time and cannot be replicated in other COIN campaigns, I would also like to argue a wider point that the ‘lessons’ from the Malayan Emergency era cannot be reasonably seen as ‘universally enduring COIN maxims’ because there is no universal understanding of what is meant by the British ‘success’ and the ‘lessons’. In this, it remains debatable whether the many ‘lessons’ generated from the much-vaunted British ‘success’ during the Malayan Emergency, are indeed ‘universally enduring’ solutions to insurgency. *If war is a continuation of politics by other means, then it follows that insurgencies, being irregular wars in themselves, cannot be ended or ‘solved’ without a political solution.* In fact, the earlier review in this essay of the many ‘lessons’ drawn from the Malayan Emergency era, showed a one-sided operational-level

centric discourse on how to curb and incapacitate the Malayan insurgency but not solve it politically.³³


Given that the actual political end to the communist insurgency in Malaya only materialised in 1989, as well as the idea that the declaration of the end of the Malayan Emergency in 1960 reflected more political rhetoric than an actual end to the insurgency, I will argue that the idea of a ‘British success’ against the Malayan communist insurgency becomes as problematic as the attempts to draw ‘lessons’ from such a ‘success’.³⁴ It is notable that the only attempt at a political solution during the Malayan Emergency was in late 1955 when Chin Peng unsuccessfully negotiated with the newly formed Malaya federal government under Tunku Abdul Rahman, for the legalisation of the Malayan Communist Party as a political party.³⁵ Ultimately, short of a campaign of total annihilation akin to what the Sri Lankans did to the Liberation Tigers of Tamil Eelam in 2006, COIN measures cannot possibly replace the political solution to an insurgency and hence cannot be touted as a true ‘success’ that is able to produce ‘lessons’. Indeed, the centrality of political solutions over COIN measures is also made in some ‘revisionist’ views of David Petraeus’ COIN achievements in Iraq—that contrary to popular belief, what ‘turned’ the Iraqi insurgency against US-led forces in 2007 was not Petraeus’ widely credited ‘population-centric’ COIN strategy and ‘troop surge’—both of which are highly reminiscent of British COIN measures in the Malayan Emergency.³⁶ Rather, it was ‘turned’ by changes to the political calculations of the Sunni Iraqi insurgents who had [politically] ‘cut a deal’ with the Americans.³⁷

Furthermore, the Malayan Emergency COIN ‘lessons’ in themselves continue to be the subject of competing interpretations and can hardly be taken as ‘universal maxims or principles’. As seen in the ‘lesson’ of ‘winning

hearts and minds' which is frequently thought to have 'won' the Malayan Emergency for the British, there is no fixed understanding to what it actually means.³⁸ On the one hand, 'hearts and minds' and its modern incarnation of 'population-centric' COIN have been argued to be effective because it espouses *"distinctly liberal, humanistic values like protecting civilians, cultural sensitivity, and rigid adherence to ethical standards and the law"*.³⁹ This notion sets 'hearts and mind' up to be diametrically opposed to force and violence and implies that the 'limited use' of coercion coupled with 'propaganda of good deeds' 'won it' for the British against the communist insurgents in Malaya, which also became an oft-cited COIN 'lesson'. On the other hand, others have contended that the British use of 'minimum force' was a myth during the Malayan Emergency and that the modern discourse on 'hearts and mind' and 'population-centric' COIN is a misreading and misunderstanding of the coercive and violent history of COIN, replacing it with a *"story of warm and fuzzy war, of benevolent soldiers providing essential government services to grateful natives, of armed social work"* (with the military acting like a) *"gigantic peace corp"*.⁴⁰ Notably, Ampssler and Miller contest the effectiveness of 'hearts and minds' during the Malayan Emergency, while Hack argues that it was in fact 'persuading minds' rather than 'winning hearts'.⁴¹ Overall, the problem at hand is perhaps best summed up in the terse words of Miller, *"Malaya as the exemplar for modern COIN is a dead letter. The casual use and misuse of the phrase 'hearts and minds' should be guarded against. The unique conditions of the Malayan Emergency are unlikely to be repeated."*⁴²

CONCLUSION

In conclusion, I have first showed through literature review, that the assumption that the Malayan Emergency is often viewed as a paradigm

from which 'lessons' can be drawn for present day COIN situations is indeed correct. I have also contended that this constitutes a propensity by COIN 'practitioners' and 'experts' to 'template' the British experiences in the Malayan Emergency and that 'templating' has shown to be ineffective for the US and British in subsequent COIN campaigns because the 'lessons' drawn from the British 'success' in the Malayan Emergency are fundamentally not universally enduring COIN maxims independent of time, place and situation. To support my argument, I have first used the 'lesson' of 'population control' to contend that its operational effectiveness was uniquely contextual to the confluence of demography, socioeconomics and geography of Malaya at that time and cannot be replicated in other COIN contexts like Vietnam or even Syria. I have also used the 'lesson' of 'hearts and minds' to argue a wider point that 'lessons' from the Malayan Emergency era cannot be reasonably seen as 'universally enduring COIN maxims' because there is no universal understanding of what is meant by the British 'success' and the 'lessons'. Significantly, COIN measures cannot possibly replace the political solution to an insurgency and hence cannot be touted as a true 'success' that is able to produce 'lessons'. Ironically, the fact that 'lessons' drawn from the Malayan Emergency era are not universally enduring COIN maxims independent of time, place and situation, is actually seen in Mao's explanation that in revolutionary warfare, *"the difference in circumstances determines the difference in guiding the laws of war; the difference of time, place, and character. The laws of war in each historical stage have their characteristics and cannot be mechanically applied to a different age... nothing remains changeless."*⁴³ 

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5. Sunderland, Riley, *Anti-guerrilla intelligence in Malaya, 1948-1960*, (CA: Rand, 1964)

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6. Komer, R.W., *The Malayan Emergency in Retrospect: Organisation of a Successful Counterinsurgency Effort*, (CA: Rand, 1972), 3

He also concluded that the US involvement in Vietnam would have benefited if it had placed "earlier and greater emphasis on certain features crucial to UK success in Malaya (1) a more balanced civil/police/military effort, rather than one so overwhelmingly military; (2) unified conflict management at all levels; (3) far greater emphasis on the counterinsurgency type of intelligence and on efforts to root out the directing cadre of the insurgency; (4) more focus on breaking the links between the insurgents and the population, rather than so much on military operations against elusive enemy forces and (5) far greater stress on outbidding the insurgents for popular support – not so much by massive economic development as by effective equitable and responsive government operating under a rule of law." (p.87)

7. Nagl. John, A., *Learning to Eat Soup with a Knife: Counterinsurgency Lessons from Malaya and Vietnam*, (Chicago: University of Chicago Press, 2005)

8. Ucko, David, Countering Insurgents through Distributed Operations: Insights from Malaya 1948–1960, *The Journal of Strategic Studies*, (2007), 57

Ucko argues that Distributed Operations (DO) offers some advantages in irregular warfare, but must be complemented by five drivers of institutional adaptability, adequate training, an effective intelligence gathering system, fusing intelligence gathering with dissemination, and separation of insurgents from population. However, he is circumspect about the ability to reproduce the Malayan Emergency success in DO in other COIN.

9. (FM3-24, 2006; CEDF, 2010)
10. Hack, Karl, *Extracting counterinsurgency lessons: The Malayan Emergency and Afghanistan*, (2009), 5 <http://www.rusi.org/analysis/commentary/ref:C4B14E068758F1/>
He explains that “1. [A good number of enforcers] are required to achieve population/spatial control and achieve population-centric security, 2. population and spatial control forms the necessary core of a matrix of policies, in which 'persuading minds' and 'winning hearts' are subordinate. The emphasis was on civilian hearts and minds measures in combination with achieving a degree of physical security through population and spatial control of disputed rural areas. 3. It was important to find a force or ethnic groups within a society, and work with their weight. 4. The geography of operations can differ within a single insurgency: different areas may be at different phases simultaneously. In addition, it is no good simply basing operations around government units of administration; they need to override government fissures through executive committee systems, and through tailoring operations to enemy geographical frameworks. 5. Propaganda and rewards must also be distributed effectively. In Malaya, the incorporation of ex-insurgent intelligentsia into propaganda roles was also vital. 6. Counterinsurgent forces must become learning organisations”
11. Hack, Karl, *Extracting counterinsurgency lessons: The Malayan Emergency and Afghanistan*, (2009), 2, 20 <http://www.rusi.org/analysis/commentary/ref:C4B14E068758F1/>
These are described as “1. Counter terror and sweep (1948-49); 2. Clear and Hold characterised by population control, persuading minds, and massive concentration of resources, along with the declaratory aim of self-government (1950-52); and 3. Optimisation, characterised by winning hearts as well as minds, faster progress to independence, finessing operations, and becoming an efficient “learning organisation” (late 1952-60).”
12. Mockaitis, Thomas, *British Counterinsurgency, 1919-60*, (London: MacMillan, 1990)
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14. Hamilton, Donald W, *The Art of Insurgency :American Military Policy and the Failure of Strategy in Southeast Asia*, (Wesport: Praegar. 1998)
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15. Eliot, David, Can ‘Lessons of Vietnam’ be Applied to Iraq? Llyod C Gardner and Marilyn B Young, *Iraq and the Lessons of Vietnam*, (New York, London: New Press Room, 2007)

On this issue, I would also like to make a side argument that, even if prominent COIN “theorists’ and “experts’ do not explicitly relate their theories and observations to the “lessons learnt’ from the Malayan Emergency, the larger body of COIN literature produced by them reflects the template-approach in which COIN experiences are treated as generalisable and reducible to “laws” (Galula, 1964), “principles” (Beckett, 1988; Hack, 2009a; 2009b; Petraeus, 2009), “pillars”, “frameworks” and “articles” (Kilcullen, 2006a; 2006b; 2010) and “premises” (Rigden, 2008) all of which implicitly claim some degree of universality in application across other COIN campaigns. While many of these authors have rather schizophrenically argued both sides of the coin (no pun intended) – that COIN experiences are contextually circumscribed and can neither be replicated nor “templated”; but at the same time “lessons’ and “principles’ can be drawn from the experiences – it begs the question of what one intends to do with such “lessons’ and “principles’. It is almost inevitable that such an epistemic enterprise ultimately seeks to inform decision-makers and commanders on how to handle future COIN campaigns. This in itself, contradicts renowned warfare philosophies propounded by the likes of Clausewitz, Von Seekt and Mao, who have all rejected the possibility of reducing the nature of war to a list of principles, rules or “schemas”. Furthermore, these “principles’ tend to get embedded into military and government COIN doctrines (as shown in Kilcullen, 2006; Rigden, 2008; Gentile, 2009) that eventually get acted upon in one way or another. This, I contend, fulfills the self-defeating vicious cycle of “theorising-templating’ and perpetuates a tendency amongst COIN “practitioners’ to implicitly favour “templating’. In fact, this bias is evident when COIN “practitioners’ and theorists lament that “old lessons” are “painfully relearned” in one COIN campaign or another. For example, Beckett (1988) argues that the Soviets had to “relearn” their “painful old lessons” of the suppression of the Basmachi revolt of the 1920s. More recently, Donovan (2012) commented in a BBC article that, “General Petraeus acknowledged that... those old lessons [learned in Vietnam and elsewhere] were still having to be relearned in Iraq and Afghanistan, he said... Lessons

and principles that should have been learned, partly from our own sweat and blood, had been discarded like a pair of old shoes. Gentile (2009, pp7 -8) puts this into perspective, as he rightly argues, “because the United States has “principilised’ population-centric COIN into the only way of doing any kind of counterinsurgency, it dictates strategy...population-centric COIN principles have been turned into immutable rules that are dictating strategy in Afghanistan and... If we accept that the principles are applicable, then we have already chosen the way ahead in Afghanistan”.

16. Ucko, David. 2007. Countering Insurgents through Distributed Operations: Insights from Malaya 1948–1960, In: *The Journal of Strategic Studies* 30/1 (Feb.2007), 47–72

Hack, Karl, *Extracting counterinsurgency lessons: The Malayan Emergency and Afghanistan*, (2009) <http://www.rusi.org/analysis/commentary/ref:C4B14E068758F1/>

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Cohen, Michael A., The Myth of Kinder Gentler War, *World Policy Journal*, (2010), v._27, n._1, 2010, 75–86
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20. Reid argues that only 2 or every 10 Chinese who migrated to Malaya before WWII had stayed.

21. Introduced by Harold Briggs when he was appointed Director of Operations in 1950.
22. Miller, Sergio, *Malaya: The Myth of Hearts and Minds*, *Small Wars Journal*, (2012)
23. For example, Hack (2009b p. 19) notes, "There were many nuances, for instance radio broadcasts by ex-insurgents describing their first Chinese New Year outside of the jungle, with roast duck to eat and family around".
Hack (2009b p. 16) explains that "Rewards were also increased from 1950, not only for civilians, but also for insurgents who brought in weapons or comrades. Thousands of 'Safe Conduct' passes were dropped, sometimes including a promise of a reward for members of the public who helped any 'Chinese Terrorist' with a pass".
Ramakrishna, Kumar, 'Bribing the Reds to Give Up': Rewards Policy in the Malayan Emergency, *War In History*, (2002), v._9, n._3, 332-363
24. Black, Jeremy. *Introduction to Global Military History*, (London, New York: Routledge, 2005)
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27. Hack, Karl, The Malayan Emergency as counter-insurgency paradigm, *Journal of Strategic Studies*, (2009), 10
28. Ampssler, Noor, R., Hearts and Minds: Malayan Campaign UK Defence Forum, <http://www.defenceviewpoints.co.uk/articles-and-analysis/heart-and-minds-malayan-campaign-re-evaluated> (2010)
29. Ibid.
30. Thompson, Leroy. *The Counter-Insurgency Manual*, (London: Greenhill Books, 2002), 88.
31. Unlike the class-based insurgency of Malaya that had a political goal and even an insurgency strategy, Danahar (2013) notes that the Syrian "rebels" are a motley crew of sectarian-based militias, Al-Qaeda-linked Islamists, armed gangs of criminals, and groups out for revenge killings.
32. Ibid.
33. Interestingly, Gentile (2009) describes this discursive fervor as a new "Zeitgeist for COIN" plaguing the US Army today, and that the "US military COIN strategy is really nothing more than a bunch of COIN principles, massaged into catchy commander's talking points for the media, emphasising winning the hearts and minds and shielding civilians. The result is a strategy of tactics and principles" (p.15).
34. According to Talib (2005, p. 22) "After a series of negotiations between the Malaysian Government and the MCP, with the Thai Government as the mediator, the MCP finally agreed to sign a Peace Accord in Haadyai, Thailand on the 2 December 1989. The peace accord did not require the MCP to surrender; it only required that the MCP cease their militant activities. With the signing of the Haadyai Peace Accord, the MCP agreed to disband their armed units and destroy all of their weapons. They also "pledged their loyalty" to His Majesty the Yang di Pertuan Agong of Malaysia. This date marked the end of the MCP insurgency in Malaysia."
Talib (2005, pp. 14-15) cites the Malaysian Government White Paper Report: The Militant Communist Threat to Malaysia, and argued that "Despite declaring the end of emergency, the war against the communist insurgency never really ended. The declaration only ended the usage of emergency laws, but the fight against the MCP continued". He also cites British government sources that explain the end of the Emergency was declared, "... for two reasons. Economically, if the law of emergency dragged on for a long period, it would have jeopardised the Malayan economy. For a new nation like Malaya, such a situation would be detrimental to the development of the country. Furthermore, the British involvement in rehabilitation work during the emergency in Malaya was financially costly. Continuing the emergency would overly burden the new Malayan government".
35. The documents reveal that the Alliance Party was ready to grant amnesty to the communists to reduce the bloodshed and after it scored a huge victory in the country's first federal election in July 1955 under Tunku Abdul Rahman, he accepted Chin Peng's offer to negotiate in September. The actual talks between the two sides in Dec 1955, in Baling, Kedah, was inconclusive as Tunku wanted the communists to surrender while Chin Peng wanted the CPM to be legalised and allowed to contest in elections.

36. Ricks, Thomas. 2007. *Fiasco: The American Military Adventure in Iraq, 2003-2005*, (Penguin, 2007)
Casebeer, William D. and Russell, James A., *Strategic Insights, Storytelling and Terrorism: Towards a Comprehensive 'Counter- Narrative Strategy'*, (2005), v._4, n._3
37. Gentile (2009, pp 10-11) argues that "Quite possibly, the will of the Sunni insurgency broke long before the Surge went into full effect in the summer of 2007. A combination of brutal attacks by Shia militia in conjunction with the actions of the Iraqi Shia government and the continuing persecution by al Qaeda against the Sunni community convinced the insurgents that they could no longer counter all these forces and it was to their advantage to cut a deal with the Americans. To be sure, the reduction in violence that began in the summer of 2007 in Iraq had multiple causes, and the Surge did contribute. But to think that the reduction of violence was primarily the result of American military action is hubris run amuck".
38. Coined by Gerald Templer in 1952, as a priority, when he assumed the combined post of High Commissioner and Director of Operations. Miller (2012) notes that, "the phrase comes from a speech... it was an appeal: the answer lies not in pouring more soldiers into the jungle, but in the hearts and minds of the Malayan people'.
39. Short, Anthony, *The Communist Insurrection in Malaya: 1948-1960*, (New York, Crane Russak & Company, 1975)
Coates, John, *Suppressing Insurgency: An Analysis of the Malayan Emergency, 1948-1954*, (Boulder Colorado: Westview Press, 1992)
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40. Bennett, Huw, 'A very salutary effect': The Counter-Terror Strategy in the Early Malayan Emergency, June 1948 to December 1949, *The Journal of Strategic Studies*, (2009), v._32, n._ 3, 415-444
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ohen, Ibid.
West, Bing, *The Wrong War: Grit, Strategy, and the Way Out of Afghanistan*, (Random House, 2012)
41. In this Ampssler (2010) argues that, "A series of reports prepared by Sir Donald MacGillivray, Templer's successor as High Commissioner, on the position of the Chinese community stressed that gaining the hearts and minds of the Chinese remained an elusive goal and that the Chinese lacked, "any feeling of loyalty towards Malaya or her Governments". MacGillivray's observations reflect the general consensus amongst British administrators and officers who believed that the Chinese remained very much "on the fence." It is telling that these assessments were prepared in 1955, by which time the communists had been soundly defeated as a significant military force".
Since it was primarily use of military force and "population and spatial control' complemented by a distribution of incentives that isolated the insurgents from the population.
Miller, Sergio, *Malaya: The Myth of Hearts and Minds, Small Wars Journal*, (2012)
Hack, Karl, *Extracting counterinsurgency lessons: The Malayan Emergency and Afghanistan*, (2009) <http://www.rusi.org/analysis/commentary/ref:C4B14E068758F1/>
Hack, Karl, The Malayan Emergency as counter-insurgency paradigm, *Journal of Strategic Studies*, (2009), v._32, n._3, 383-414
42. Miller, Ibid.
43. Elliot-Bateman, Michael, *Defeat in the East: The Mark of Mao Tse-Tung on War*, (Oxford University Press, 1967)



MAJ Lim Yu Sing is an Air Warfare Officer (Ground Based Air Defence) and is currently a Branch Head at Air Force Information Centre. MAJ Lim graduated as a Distinguished Graduate from the 44th Command and Staff Course at the Goh Keng Swee Command and Staff College. He holds a Bachelors of Social Sciences (Honours) in Sociology from the National University of Singapore, and a Masters of Science in International Communications from Leeds University.

CYBER THREAT – A GLOBAL SECURITY THREAT

by ME5 Seah Ser Thong, Calvin

Abstract:

The technology boom of the 21st century has led to the rapid rise and influence of the Internet on people around the world. Originally created to interconnect laboratories engaged in government research, the Internet has now become a universal information sharing platform that brings people from all walks of life closer together. However, this increased interconnectedness of information sharing has its disadvantages and perils. International hacking groups like 'Anonymous' have increased efforts to obtain information through illegal and unethical means, while cyber threats like the Stuxnet Worm have become increasingly prevalent. As such, an increasing number of countries are investing more into cyber security to combat these cyber threats. This essay will delve deeper into the nature and extent of cyber threats and its impact on the military and potential cyber defence measures.

Keywords: Cyber; Interconnect; Unethical; Security Threats; Information

INTRODUCTION

"Cyber threat is one of the most serious economic and national security challenges we face as a nation."

– Barack Obama, US President¹

The Internet is a medium that all of us have gotten so used to. It has grown fast and furious and has seen an increase in usage from 16 million users to 2,937 million users presently since it was created to interconnect laboratories engaged in government research in the 1990s.² It has become the universal source of information for people all over the world and has inadvertently become a battlefield for a new kind of warfare, 'Cyberwarfare'. With cyber threats such as the Stuxnet Worm that appeared to have attacked Iran's nuclear programme to the 'Anonymous' international network of hackers, governments around the world have been called to arms to deal

with this new threat. In 2011, the United States (US) Department of Defence even designated cyberspace as an 'operational domain' in which US forces will be trained to defend.³ Closer to home, Singapore Prime Minister Lee Hsien Loong unveiled a \$130 million plan in 2013 to enhance the nation's cyber security firepower in the face of a rising tide of global cyber-attacks in 2013.⁴ This essay explores the threat posed by cyber threats as well as proposes a framework for cyber defence.

CYBER THREATS

So, are cyber threats just hype or an overreaction by everyone? A proxy would be searching the Internet using the search key 'cyber threats'. It is telling to see the huge amount of interest in these matters.⁵ While hacking and virus-writing began as hobbyist activities not meant to cause serious long-term harm,

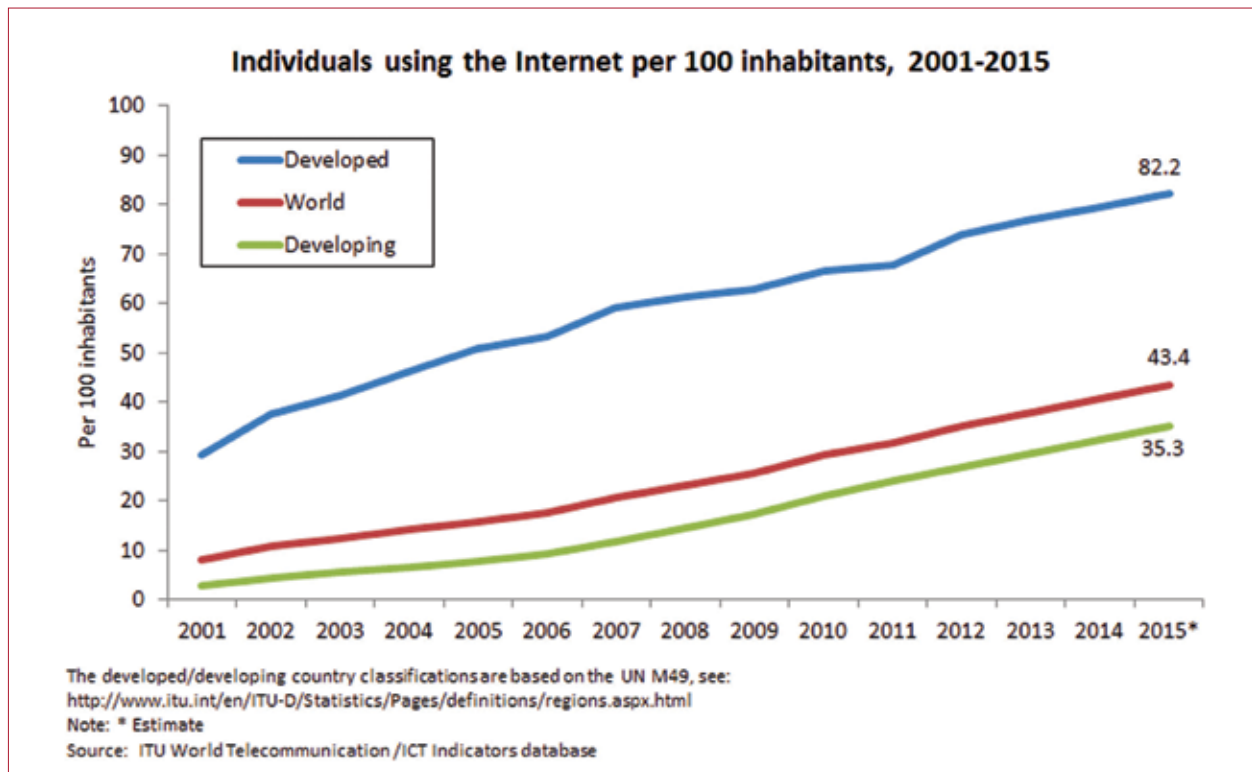


Figure 1: Internet users' growth⁶

cyber threats have since evolved towards achieving financial and political objectives and have also become destructive in nature.⁷ Let us now take a look at some of the incidents and damages posed. It is noteworthy that these incidents are wide-ranging

and can be triggered by national governments, organisations and individuals. They also involve cyber-attacks like hacking and even scams and can be represented by the cyber threats spectrum shown in Figure 2.

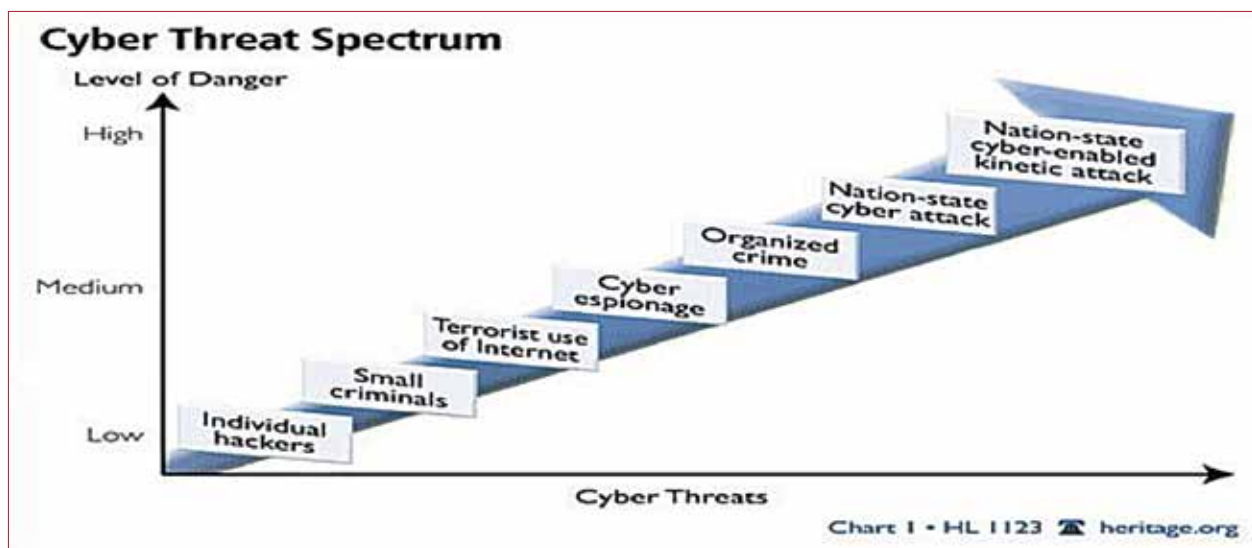


Figure 2: Cyber threat spectrum of the various threats and level of danger posed.⁸



Actual Facebook profile of United States Navy Admiral James Stavridis. The fake account was immediately taken down when Facebook was notified.⁹

Attack on Estonia (2007)

A three-week wave of cyber-attacks was made on Estonia in April 2007 that swamped websites of Estonian organisations, including the Estonian parliament, banks, ministries, newspapers and broadcasters.¹⁰ These were a wave of so-called Distributed Denial of Service (DDoS) attacks, where websites are suddenly swamped by tens of thousands of visits, jamming and disabling them by overcrowding the bandwidths for the servers running the sites. This crisis happened amidst the country's disagreement with Russia about the relocation of the Bronze Soldier of Tallinn. The North Atlantic Treaty Organisation (NATO) had to dispatch some of its top cyber terrorism experts to Tallinn to investigate and to help the Estonians beef up their electronic defences. Estonia is now home to NATO's Cooperative Cyber Defence Centre of Excellence which was established in response to what has become known as 'Web War 1'.¹¹

While hacking and virus-writing began as hobbyist activities not meant to cause serious long-term harm, cyber threats have since evolved towards achieving financial and political objectives and have also become destructive in nature.

Stuxnet Worm (2010)

The Stuxnet is a computer worm that infected the Iranian nuclear programme systems in 2010 and apparently set back the Iranian nuclear programme by as much as two years. Reputable experts in the computer security community had labelled Stuxnet "unprecedented... an evolutionary leap and the type of threat we hope to never see again."¹² The worm was designed to attack industrial Programmable Logic Controllers (PLCs) and its authorship remains unknown.¹³ This is highly significant, as the Stuxnet Worm has resulted in flaws in existing security assumptions and was able to inflict damage on industrial systems that were outside the Internet. It is reported that, unlike Denial of Service (DOS) attacks that could take at most weeks to clear up, Stuxnet-like attacks can set their victims back by many years.¹⁴

Facebook Sham (2011)

In 2011, senior British military officers, Defence Ministry officials and other government officials were tricked into becoming Facebook friends with someone masquerading as US Navy Admiral James Stavridis.¹⁵ This allowed their information to be compromised. Even though the fake Facebook account was deleted



The government website of Singapore's Prime Minister's office was hacked by Anonymous on 7th November, 2013.¹⁶

within 24 to 28 hours of being discovered, it was difficult to find the creator of the account. *"There have been several fake supreme allied commander pages,"* a NATO spokesperson said in a statement.¹⁷ *"We recognise that there are vulnerabilities in infrastructure... That's why we see breaches by the thousand every single month. We know that the capabilities of foreign states are substantial and we know the type of information they are targeting,"* said Shawn Henry, an FBI Executive Assistant Director, in a statement.¹⁸ This highlights the real danger in our use of social media.

Singapore Defence Minister, Dr Ng Eng Heng, also pointed out that cyber-attacks could develop into nightmare scenarios where the networks that the SAF relies upon during operations are incapacitated.

Activist group Anonymous (2013)

The government web-site of Singapore's Prime Minister's office was hacked on 7th November, 2013 by apparent members of the activist group 'Anonymous' after Prime Minister Lee Hsien Loong told local journalists that his government would *"spare no effort"* in going after Anonymous members who had threatened to wage a cyber-war against Singapore.¹⁹ *"It's great to be Singaporean today,"* read a mocking headline in a section of the Prime

Minister's Office website, next to the group's trademark Guy Fawkes mask - a symbol of anti-establishment defiance worldwide.²⁰ The defaced section was quickly taken offline after the hacking incident surfaced in a posting on Facebook.

Ukraine conflict (2014)

The hostilities between Ukraine and Russia are currently mirrored by a corresponding cyber war where, as an analysis of internet traffic suggests, both sides have opened up an online front. In one instance, dozens of Ukrainian computer networks, including those run by the Kiev government, have been reportedly infected by the aggressive 'Snake' or 'Ouroboros' virus.²¹ The number of cyber-attacks traded between Ukraine and Russia appears to have risen sharply as relations have worsened with the overthrow of the Yanukovich government and the annexation of Crimea. The online struggle is being waged by a mixture of state forces, criminal gangs as well as independent 'patriotic hackers'. Activists and experts have suggested that this sets a pattern likely to be repeated in future conflicts.²² Greg Day, the Vice-President of FireEye had mentioned that the spread of information technology had widened the arena for conflict and meant combatants no longer had to be heavily armed with expensive weaponry.²³ This could suggest the simultaneous use of military and cyber warfare in future conflicts. It could be a potential vulnerability to watch out for with our dependency on IT systems.

CYBER THREATS VERSUS THE MILITARY

Threats to the Military

In the United Kingdom (UK), it was quoted that a group of Member of Parliament (MPs) had mentioned that the threat of a cyber-assault on Britain is considered so serious that it is being marked as a higher threat than a nuclear attack.²⁴ Singapore Defence Minister, Dr Ng Eng Heng, also pointed out that cyber-attacks could develop into nightmare scenarios where the networks that the SAF relies upon during operations are incapacitated. These networks support the Singapore Armed Forces' (SAF) surveillance, weapons, engineering, logistics, and most importantly, communication systems.²⁵

With enduring cyber threats looming, many countries have actually commenced the setup of cyber defence organisations within their militaries to take them on. Let us take a look at the initiatives taken by various countries' militaries in the war against cyber threats.

(1) US Department of Defence (DoD)

The US Cyber Command officially began service in October 2009 and aims to protect US military networks, as well as possibly launching digital warfare attacks against rival nations.²⁶ The department was established by Defence Secretary Robert Gates and marked the first time the US government has ever created such a department. A fivefold increase in the staff of the US Cyber Command in 2013 is indicative of how conflict in cyber space is moving towards centre stage for the US military, a domain similar to land, sea, air and outer space.²⁷ As reported by Ellen Nakashima in *The Post*, there are three types of forces under the Cyber Command. Two are familiar: 'Combat Mission Forces' to serve in parallel with military units and 'Protection Forces' to defend Pentagon networks.²⁸ A third area

is new: 'National Mission Forces' that seeks to remove threats to critical infrastructure in the US, such as electrical grids, dams and other potential targets deemed vital to national security and are expected to operate outside the US, perhaps launching pre-emptive strikes on adversaries preparing to take down critical US infrastructure.²⁹

2) UK Ministry of Defence (MoD)

The UK Defence Secretary had announced in 2013 that a new cyber unit would be created to help defend national security with hundreds of reservists recruited as computer experts to work alongside regular forces in the creation of the new Joint Cyber Reserve Unit.³⁰ The role of the unit is to protect computer networks and safeguard vital data and, if necessary, launch strikes in cyberspace. Conservative Minister, Mr Philip Hammond told the Conservative Party conference that "*the threat is real... and that... Last year... cyber defences blocked around 400,000 advanced, malicious cyber threats to the government secure intranet alone.*"³¹ The MoD said the recruitment of reservists will target regular personnel leaving the armed forces, current and former reservists with the required skills and civilians with the appropriate technological skills and knowledge.³²

(3) Japan Ministry of Defence (MoD)

While cyber security in Japan is largely the responsibility of its Self Defence Forces, however, Japan's Ministry of Defence set up Japan's first Cyber Defence Unit on 26th March, 2014 as it reorganised the ministry's hitherto disparate cyber security teams under a single command.³³ The new combined command unit, with a budget of ¥14.1 billion (US \$141.9 million) as compared to the previous year's ¥9.1 billion for its cyber teams, will provide integrated 24-hour cyber security monitoring, inspection and

analysis, defence, cleansing and training functions for the entire military.³⁴ It was formed with an initial staff of a hundred to act as a central hub to co-ordinate responses and develop expertise and training. Politically, the government has also established new rules governing the circumstances in which Japan may counter attack against a cyber-threat.³⁵

(4) Singapore's Military Response

Back home, Singapore has set up a centralised Cyber Defence Operations Hub in 2013 for more robust defences of its military networks. In announcing the setting up of the operations hub, Defence Minister Dr Ng Eng Hen mentioned that the round-the-clock operations hub will allow the SAF to build up its expertise to not only combat evolving cyber threats, but also disrupt the military's front and back-end systems. The hub is established to defend the Ministry of Defence (MINDEF)/SAF military networks against cyber threats. The hub will partner Singapore Infocomms Technology Security Authority to keep abreast with the latest developments in cyber threats and will also draw on the existing expertise of the SAF and MINDEF, as well as the defence technology community.³⁶ The SAF has been consistent in its build up to keep abreast with the increasing cyber threats. As mentioned by Dr Ng, the SAF was not starting from scratch, but amalgamating existing SAF-wide resources that deal with cyber-attacks.³⁷

CYBER DEFENCE FRAMEWORK

Reflecting on how all international conflicts now have some digital component, the North Atlantic Treaty Organisation (NATO) has updated its cyber defence policy to make it clear that a cyber-attack can be treated as the equivalent of an attack with conventional weapons. The organisation's new cyber defence policy clarifies that a major digital attack on

a member state could be covered by Article 5, the collective defence clause. That states that an attack against one member of NATO "shall be considered an attack against them all" and opens the way for members to take action against the aggressor—including the use of armed force—to restore security.³⁸ That NATO is updating its cyber defence strategy now shows how rapidly cyber warfare has jumped up the agenda.³⁹ Besides recognising cyberspace as an 'operational domain', and taking actions against potential cyber aggressors, what more could be done by the military to combat cyber threats? What are the challenges that must be faced? I will outline some of the challenges that would need to be considered before implementing any cyber defence strategy.

a. People as the weakest link

While systems can be put in place, people always turn out to be the weakest link. The human tendencies to be trusting and inquisitive make people gullible to the many cyber shams that are out there on the Internet. As such, increased awareness is necessary to ensure that people are not the weakest link.

b. Lack of Cybersecurity Competency

While casual users of the Internet are aplenty, there is a lack of 'cyber talent', and this could be a gap that provides a possible vulnerability.⁴⁰ This is partly due to a massive global demand that stretches an already small, existing pool of people.⁴¹ The Cisco 2014 Annual Security Report has reinforced this gap with its estimation that by 2014, the industry will still be short of more than a million security professionals across the globe.⁴²

c. Lack of attribution of Cyber Attacks

There is a challenge to attribute attacks to specific perpetrators in cyberspace as identities can

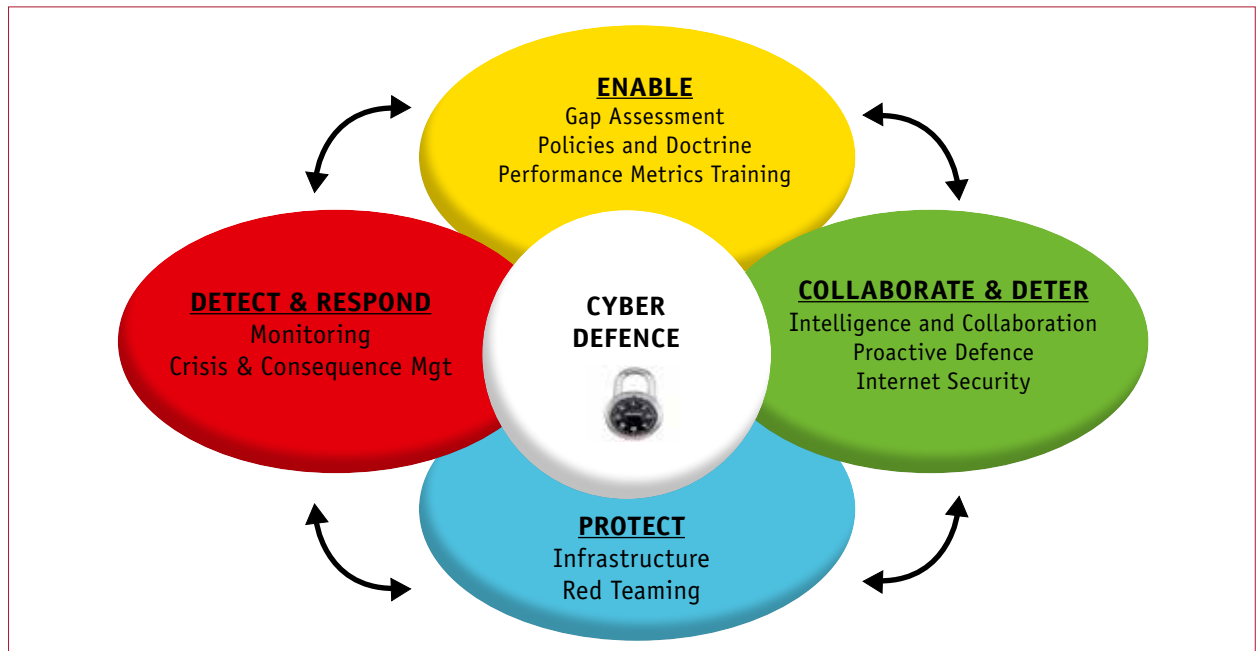


Figure 3: Proposed Cyber Defence Framework

be easily masked. Even if that is possible, there is the added difficulty in determining if he is a representative of a state, a state-sponsored actor, a terrorist or just a prankster. As governments cannot be easily made liable for cyber-attacks done by private hackers working individually, retaliation becomes an unlikely scenario. Consequently, if the attacker is misidentified, there is a possibility of harming innocent individuals or targeting the wrong place.⁴³

d. **Dilemma of Individual Privacy Versus National Security**

In ensuring cyber security, the above-mentioned would be a common tussle. The revelation by former Central Intelligence Agency (CIA) technical worker, Edward Snowden, in June 2013 that the National Security Agency (NSA) was collecting millions of telephone records and monitoring internet data to track individuals suspected of terrorism and spying highlights this fragile balance.⁴⁴ In response, US President Barack Obama defended the surveillance

programme as a modest encroachment on privacy and necessary to protect the US from terrorist attacks. Therefore, while individuals value their privacy, it may have to give way in the interest of national security.

e. **Lack of boundaries in Cyber space**

Cyber space has no boundaries which would mean that national boundaries are not deterrents as perpetrators can conduct attacks from anywhere as long as they have access to the Internet. This increased interconnection in the world as well as the speed of proliferation of new technological products offers increased opportunities for cyber-attacks.

I seek to propose a cyber defence framework that could be undertaken along the key tenets of Enable, Collaborate and Deter, Protect and Detect & Respond. It is important that a defence-in-depth approach is taken so as to provide overall resilience against any cyber threats.

A. Enable

This tenet is about understanding and improving the current state of preparedness against any cyber threats.

(1) *Gap Assessment*

The start state would be to make an assessment of the cyber security maturity and identification of areas of vulnerability as well as technological readiness. Comparison with the industry regulations, standards and best practices would be the start state for such an assessment. Even after the establishment of a cyber security system, vulnerability assessments which help to identify and prioritise network vulnerabilities should still be conducted periodically and after security updates. The outcomes would be to generate comprehensive reports and databases identifying known vulnerabilities that can be exploited.⁴⁵

NATO's defence clause states that an attack against one member of NATO "shall be considered an attack against them all" and opens the way for members to take action against the aggressor—including the use of armed force—to restore security.

(2) *Policies and Doctrine*

There is a need to build up the policies and doctrines to manage and respond to cyber threats. It would be necessary to develop an overarching cyber security doctrine rather than a patchwork of policies and agencies dealing with cyber threats. The doctrine could define several aspects of cyber security, including defence against attacks, steps taken to deter

attacks, safe usage of the networks as well as the kinds of attacks that will be responded to.⁴⁶ This process should include a review, update and enforcement of security policies and legislation as well as the establishment of baseline control over network access and usage protocols.

(3) *Performance Metrics*

While it may not be possible to measure in the beginning, it is necessary to develop metrics to assess the operational effectiveness of cyber defence measures as a function of time. This would enable better decision making about the cyber defence investments required. Such measurements can also help decide on the continuation or termination of cyber defence measures, as well as providing important hindsight. It is noteworthy to consider benchmarking. However, proxies may be necessary as the information gathered would inherently be classified in nature.

(4) *Training*

There would be a need to institutionalise the training of personnel. Sustaining a continued pool of trained personnel who are technologically skilled and cyber-savvy would be essential. More importantly, they must have hands-on skills and not just academic knowledge. The launching of the first and only Cyber Security Academy amongst the Institutes of Higher Learning by Singapore Polytechnic in December 2013 could be one such avenue to cater to this training demand.⁴⁷

B. Collaborate & Deter

This tenet would involve deterring would-be perpetrators through establishing collaborative networks as well as establishing a proactive threat defence.

(1) *Intelligence and Collaboration*

Intelligence is a key component of this tenet and there is a need for defence agencies to work closely with local and regional counterparts to monitor and disrupt possible threats as well as to identify and pre-empt emerging threats. Feedback should be gathered from all available means and 'live' information sharing among counterparts should be established to enhance situational awareness and collaboration against cyber threats. Such alliances and defences must be on 24/7 alert to ensure constant vigilance, as well as to deter would-be perpetrators. Besides deterring external threats, there is a need to deter and mitigate against possible insider threats. This could be done through strengthening workforce communications, workforce accountability, internal monitoring and information management capabilities.⁴⁸

(2) *Proactive Defence*

Besides the setup of a responsible agency for cyber defence as a deterrent, there may also be a need to deploy proactive threat defences to deter potential adversaries. One such mechanism looked into by the US Air Force is the use of cyber deception capabilities to trick and manipulate cyber attackers. It is intended to be used solely on Defence Department networks and be concealed from adversaries, all while impeding attackers by increasing the costs of their actions while providing increasingly limited gains.⁴⁹

(3) *Internal Security*

Besides external deterrence, there is also a need to protect against insider threats. As people are the first line of defence in sustaining good cyber 'hygiene' and reducing internal threats,

there is a need for constant communication as well as the need to impose security restrictions. Existing security classifications as well as punishment for offences may have to be increased due to the sensitivity of information in this domain.

C. Protect

This tenet would involve designing and implementing a cyber defence infrastructure so as to deny any possibility of an attack.

(1) *Infrastructure*

As mentioned by former US Deputy Defence Secretary William Lynn, *"If an attack will not have its intended effect, those who wish us harm will have less reason to target us through cyberspace in the first place."*⁵⁰ An important part of this build up would be applying Disruption-Tolerant Network (DTN) technologies for both centralised and decentralised networks. DTN architecture revolves around a data-centric model and not the traditional network-centric model and helps ensure that data is protected at all times and not only in transmission.⁵¹

(2) *Red Teaming*

As part of the build-up of a cyber defence infrastructure, the employment of white-hat hackers to perform red teaming could be used to perform security evaluations of hardware security, software security and procedural security as well as to uncover potential vulnerabilities. Red teams are one of the only qualitative metrics in today's system technology discipline, thus playing an essential role.⁵² The overall goal of employing the red teams is to improve system defences.

D. Detect & Respond

This tenet is about the response as well as the investigation of any cyber threats.

(1) *Monitoring*

To be able to respond, you have to first be able to see the adversary. There is therefore a need to build detection and analytical capabilities. One way would be the inclusion of anomaly detectors to spot irregular traffic and report the findings. A truly sound security prototype will employ anomaly-based detectors alongside signature-based detectors, as neither type of detector, by itself, is fool proof. Using the two systems together properly and in serial will drastically improve a network's security posture.⁵³

(2) *Crisis and Consequence Management*

Besides containing the effects of cyber-attacks, there is a need to ensure a quick recovery. Formalising the business processes for response and recovery will help to build resilience. Cyber gaming on various scenarios can also be performed to test and improve personnel response capabilities. One example of a large scale cyber exercise is 'Cyber Storm', a pseudo cyber-attack coordinated through the US Department of Homeland Security's National Cyber Security Division which tested how senior leaders of the US government would respond to a cyber incident of national significance. The first 'Cyber Storm' was conducted over five days in 2006 and involved more than 100 public and private organisations in five different countries.⁵⁴

CONCLUSION

While we may never know when a cyber threat will ever strike, we do know that the trends are on a perennial increase and thus necessitate continued vigilance. We need to adopt an attitude where we presume that the adversary is constantly on the networks. As seen by the various examples, it is hard to pinpoint likely threats as cyber threats can be unleashed by nations, organisations or even individuals. As such, the recommended framework is proposed to ensure a swift response to any cyber threat. In conclusion, I quote the following which highlights our strong commitment to cyber defence:

"You may think you are anonymous. We will make that extra effort to find out who you are."

— Singapore Prime Minister, Lee Hsien Loong⁵⁵ 

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ME5 Seah Ser Thong, Calvin is currently attending the 46th Goh Keng Swee Command and Staff Course. He is an Army Engineer by vocation. ME5 Seah holds a Bachelors of Engineering in Mechanical & Production Engineering from NTU, the Nanyang Technological University Masters of Science in Industrial and Systems Engineering from the National University of Singapore (NUS) as well as a Masters of Science in Defence Technology and Systems from NUS, obtained under the SAF Postgraduate Award. He is a Business Excellence Assessor, National Innovation and Quality Circle Assessor as well as an American Society of Quality Judge. He was a winner of the 1st and Merit Prizes for his co-written essays at the 2013/2014 Chief of Defence Force Essay Competition and a winner of the Commendation Award at the 15th Chief of Army (COA) Essay Competition in 2014. His co-written article, 'Learning from Mother Nature: Biomimicry for the Next Generation SAF,' was recently published in the August issue of the Australian Defence Force (ADF) Journal.

The Emotional Fitness of A Soldier - Balancing Positivity and Negativity in the Military

by CPT Chen Jingkai

Abstract:

It is an unspoken fact that negativity and cynicism are damaging to many of the activities conducted within the military. The author, with examples from psychological studies and various cognitive experiments, claims that positivity can improve one's mental prowess—stating how important this is for commanders when it comes to training their men and especially out on the battlefield to lead their men to safety. Conversely, a case is also made that negativity threatens the mutual respect between soldiers and their peers, as well as between commanders and their soldiers. The author feels that the contagiousness of both positivity and negativity has an important implication for the military—that the emotional fitness of every serviceman now becomes the responsibility of his fellow comrades. Hence, this essay seeks to use empirical evidence for psychological science to make a case for increasing positivity and decreasing negativity in the military.

Keywords: Positivity; Case Study; Emotional Fitness; Psychological Resilience; Social Resource

INTRODUCTION

Why do we sing songs, in unison, during route marches? To keep the troop morale high, of course. If we do not keep singing, the fatigue built up as the route march progresses takes its toll and the comrade trudging beside us may well be cursing the sweltering heat, complaining about his sore legs and swearing at the ridiculously long distance left. Soon, we start to feel the same ourselves. Almost no one would disagree that this situation is far from ideal. In fact, the proliferation of negativity and cynicism is not just critically damaging to the success of route marches, but also to that of many other activities we conduct in the army. Positivity is essential for the man on the ground and this essay seeks to make a case for increasing positivity and decreasing negativity in the military.

The present essay does not belong to the self-help genre and hence does not tell you how to move towards a happier life. Rather, it seeks to use the empirical evidence from psychological science to make a case for increasing positivity and decreasing negativity in the military. Towards this end, I will explain specifically how positivity can enhance (and how negativity can impede) our soldiers' operational effectiveness, by (a) broadening their minds and (b) building their psychological and social resources. I will also expound how these points are related to our vision of being a 'Respected Army'. In addition, I will talk about the infectious nature of positivity and negativity and the implications that this would have on the military. Then, I will posit a nuanced view about the importance of negative emotions under certain specific, restricted circumstances. I will also



SLTC(NS) Ng (right) pinning the epaulette on his son LTA Ng at his commissioning parade. He added happily: "Of course I was very proud. To see Russell graduating from OCS and to have encouraged him through the nine months and finally (getting to) pin on the epaulette, it's a very memorable process."

seek to address the concerns that the reader may have about the judicious balancing of positive and negative emotions. However, I will briefly argue that it is not unreasonable to posit that this plan can be conceptualised, owing to progress in psychological science.

POSITIVITY, NOT NEGATIVITY, BROADENS MINDS

Positivity broadens our minds and helps us absorb as much information from the environment as we can. Negativity, on the other hand, constricts our minds and limits what we take in from the external world.¹

Out in the field, an appreciation of the battlefield situation is crucial for a commander. He needs to be on the lookout for information and note down as many relevant details as possible. He needs to be

able to piece the incoming information together in a meaningful way, connecting the dots to form a coherent whole. Creative thinking, a critical skill in the conceptual thinking competency domain in the SAF Leadership Competency Model, is also needed to achieve mission success.² In peacetime, as an instructor goes about planning and conducting training, he needs to exercise creativity so training does not get too repetitive and his trainees are able to learn more effectively. He also needs to be receptive to the beliefs, desires, aspirations and fears of his trainees to better leverage on their intrinsic motivation. When a staff officer works on a paper, he needs to go out and understand the needs and concerns of all the different stakeholders. The staff officer then needs to integrate them and represent them accurately, cogently, and sometimes creatively.



At the graduation ceremony for SAF's 'Continuing Professional Education Programme', COL Ng Wai Kit, Deputy Commandant, SAFTI Military Institute / Commandant, Goh Keng Swee Command and Staff College, spoke about how the programme enabled trainers to teach the right things, the right way.

In this section, I will argue that there is psychological evidence to suggest that an army leader can achieve the aforementioned needs better when his mind is broadened under the influence of positivity. The needs are:

- (1) receptiveness to information;
- (2) integration of information;
- (3) creativity

I will then explain how this, in turn, relates to our vision of being a 'Respected Army'.

ENHANCING RECEPTIVENESS TO INFORMATION

Positivity is said to broaden our minds because, evidently, it makes us more receptive to information.

This means that we can take in more information from the external environment. Evidence for this comes from an experiment, in which cutting-edge eye-tracking technology was used to capture the eye movements of participants who were presented with pictures on a computer screen. The pictures were grouped in threes, with one in the centre and two at the periphery. Participants were told to view the slide show passively. When positive emotions were induced in participants, they moved their eyes around more and spent more time looking at periphery photos.³

This finding suggests that positivity helps us take in more information. It allows us to observe more than what we can normally observe in a neutral or negative state. This heightened receptiveness to information

will allow the commander to be more effective in intelligence gathering; the instructor to be more attentive in observing the behaviour of his trainees; and the staff officer to be more cognisant of what the various stakeholders want.

Out in the field, an appreciation of the battlefield situation is crucial for a commander. He needs to be on the lookout for information and note down as many relevant details as possible. He needs to be able to piece the incoming information together in a meaningful way, connecting the dots to form a coherent whole.

There is a physiological explanation for how our minds are broadened with positivity. In one study, an electrical recording technique was employed to measure the activity of two muscles, which are activated in tandem to produce genuine smiles that express true positivity: the *zygomaticus major* which pulls your lip corners up and the *orbicularis oculi* which crinkles the skin beside your eyes. The researchers found that when both muscles were activated simultaneously, attention span (measured by precise computerised tests) was broadened. In a sense, one's mind is literally opened up by his smile.⁴

CONNECTING THE DOTS - SEEING THE FOREST AND THE TREES

While we know now that positivity may allow a SAF commander to take in more information, we are also familiar with the concept of information overload, a feature of this interconnected world. This phenomenon is believed to impede decision-making processes vital for mission success.⁵ As such, it is

reasonable to question if an increased receptiveness to information brought about by enhanced positivity would necessarily impair the sense-making process. However, contrary to this, evidence reveals that individuals seem to become better at integrating information coherently, when positivity is boosted.

Such evidence comes from a study, in which physicians articulated the steps leading to their diagnosis aloud, as they worked on the case of a patient with liver disease. It was found that by giving the physicians a bag of candy, they became more effective in integrating case information and were less likely to be stuck with their initial ideas. With positivity, they were less prone to arriving at premature closure in their thought processes and making diagnostic errors.⁶ Another study of business

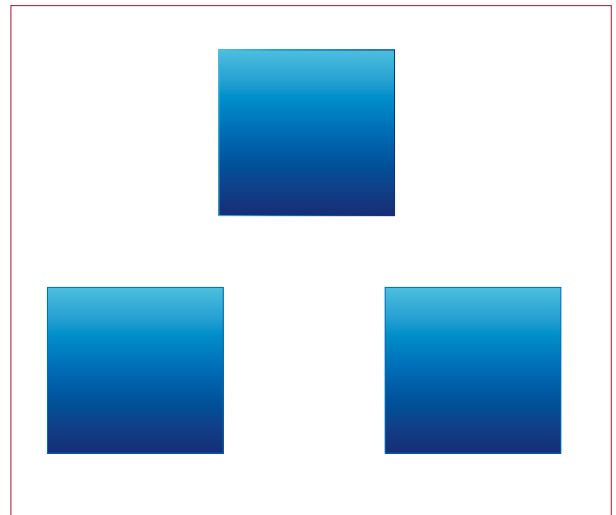


Figure 1

leaders arrived at a similar conclusion: managers who were more positive were more careful in making decisions and made less mistakes.⁷ These results, taken together, provide convergent evidence for the claim that enhanced positivity does not impede, but rather, improves integration of information. As such, it is plausible that positivity will lead to better sense-making on the part of the commander, better holistic understanding of trainees on the part of the instructor

and better synthesis of divergent stakeholder concerns on the part of the staff officer.

How does positivity help one to integrate different sources of information? One, but not necessarily the only potential explanation for this is that positivity helps one to connect the dots by preventing him from missing the forest for the trees. Look at *Figure 1*. Do you see a triangle? Or do you see a group of squares? There is no correct or wrong answer. The figure can be both. Psychologists sought to crudely measure the scope of their subject's attention by presenting similar arrangements of shapes to them. The participants reported if they saw an arrangement as being more similar to a triangle composed of smaller triangles or a square composed of smaller squares. The psychologists found that the participants' ability to see the big picture (for example the triangle for the case of

Figure 1) was dependent on their emotional state. The peripheral vision of their participants expanded or shrank depending on whether positivity or negativity was injected into them, respectively.⁸ The researchers concluded that by broadening one's mind, positivity allows one to see both the forest and the trees.⁹

A heightened receptiveness to information will allow the commander to be more effective in intelligence gathering; the instructor to be more attentive in observing the behaviour of his trainees; and the staff officer to be more cognisant of what the various stakeholders want.



Ms Salizawati and her children welcome her husband, Captain (CPT) Rudie Imran Masih, home from long periods of training. "That's how we help him maintain a positive mindset at work - by supporting him in his work."

CREATIVITY

Positivity is known to enhance creativity. In one study, participants were required to perform a task that measured their scope of attention and another that measured their creativity, using the Remote Associates Test. When positive emotions were induced in the participants, the broadness of their attention and level of their creativity were both enhanced significantly. This shows that positivity broadens the mind in multiple, interrelated ways.¹⁰

As such, it is reasonable to assert that enhancing positivity levels can help our commanders engage their creative thinking capacities better, help our instructors innovate to make training more effective and help our staff officers arrive at original proposals that stakeholders would be more amenable to. As our soldiers become more competent in the functions they perform, they can evaluate themselves in a more favourable light, and hence gain more self-respect. Moreover, when the enhanced competence and operational effectiveness of our soldiers are showcased in public events and bi/multilateral exchanges, confidence in the SAF will be reinforced and our already strong deterrent effect will increase.

POSITIVITY, NOT NEGATIVITY, BUILDS RESOURCES

Social Resources

In a POINTER monograph, former Chief of Defence Force, Lieutenant-General (LG) (RET) Neo Kian Hong, emphasised the importance of ‘interpersonal effectiveness’ and ‘communicating to influence’, as he shared his reflections on leadership in the 3G SAF.¹¹ These are vital skills in the domain of social competency, as articulated in the SAF Leadership Competency Model and they are deliberately developed in our leaders.¹² A necessary precondition for the effective deployment of the aforementioned two social skills is the existence of strong, positive relationships between the leader and the led. Such relationships

can be construed as a resource that can be built. In the present section, I will argue that positivity builds a social resource; one which fosters mutual respect amongst our soldiers.

There is evidence that by opening up and sharing his genuine positivity with others, one can strengthen the connections he shares with the latter. Fredrickson cited a study involving new college roommates, who were encouraged to express their appreciation to each other. It was found that by expressing the positive emotion of gratitude, these roommates became closer friends.¹³ According to Fredrickson, positivity allows individuals to perceive more overlap between others and themselves.¹⁴ As a result, they feel more connected to and are more trusting toward people that matter in their lives. It is not unimaginable that, through such a process, positivity can enhance camaraderie between new platoon mates in Basic Military Training and enrich the social capital present in the Army’s departmental offices. Arguably, trust goes hand in hand with mutual respect.¹⁵ This means the more our soldiers trust each other, the more respect they will tend to have for each other. As such, it is reasonable to posit that positivity would engender mutual respect. Conversely, it is plausible that negativity and cynicism would threaten the mutual respect between our soldiers and their peers, as well as, between commanders and their soldiers.

By building up a leader’s social resources, positivity allows him to attain the ‘interpersonal effectiveness’ that LG (RET) Neo spoke about. Evidence for this comes from a study conducted in the corporate world.¹⁶ Managers with greater positivity were found to infect their teams with greater positivity as well. This produced better coordination among team members and reduced the effort required to complete their assigned work. In other words, these managers

were more effective interpersonally. In the SAF context, this can be translated to higher operational effectiveness.

PSYCHOLOGICAL RESOURCES FOR RESILIENCE

*“To be resilient means to bend without breaking and to quickly rebound from adversity”.*¹⁷ Resilience is required for a soldier to deal with intensely stressful situations that arise from protracted deployments, secondary duties or even conscription. As such, it is undoubtedly perceived, by the organisation, to be essential for operational effectiveness. In this section, I will argue that positivity may yet enhance our Army’s efforts towards this end, by building the psychological resources needed for the aforementioned ‘rebound’ process.

First, I will review evidence that individuals use positive emotions to cope with adversity in life. In a series of experiments, Tugade and Fredrickson provided evidence that the experiencing of positive emotions mediated the ‘rebound’ process by helping individuals to achieve efficient emotion regulation, as assessed by accelerated cardiovascular recovery from negative emotional arousal.¹⁸ Beyond this ‘rebound’ process, the authors demonstrated that positive emotions contributed to the individuals’ discovery of positive meaning under stressful circumstances. The role of positivity in mediating resilience is not just limited to dealing with laboratory-induced stressors. Indeed, Fredrickson and colleagues showed that positivity accounted for reduced depression and increased post-crisis growth in the face of the September 11th terrorist attacks, a real-world tragedy.¹⁹

Positivity is not just important for enhancing resilience in the present moment. There is good evidence to suggest that the psychological resources built by frequent experiences of positive emotions are

lasting and hence can potentially be useful for dealing with adversity in the future. One study showed that an exercise that enhanced positivity resulted in gains in such psychological resources, which persisted over a 15-month period, even when the exercise ceased to be practised.²⁰

This means the more our soldiers trust each other, the more respect they will tend to have for each other. As such, it is reasonable to posit that positivity would engender mutual respect. Conversely, it is plausible that negativity and cynicism would threaten the mutual respect between our soldiers and their peers, as well as, between commanders and their soldiers.

Are there are real benefits of building up one’s psychological resources to deal with traumatic events? The United States (US) Army seems to think so and hence dedicate a section in their Comprehensive Soldier Fitness programme: a resilience-training programme, to the development of emotional resilience. Their belief is grounded by cutting-edge science, which reveals that such emotional resilience will significantly reduce rates of post-traumatic stress disorder and suicide, improve mental health, boost empathic accuracy, enrich interpersonal relationships, enhance problem solving skills, as well as promote wound healing, among other benefits.²¹

THE CONTAGIOUS EFFECTS OF POSITIVITY AND NEGATIVITY

Positivity and negativity are not experiences that are limited to specific individuals. Indeed, there is evidence to indicate that they are contagious.

While a previously mentioned study has suggested that a manager's positivity affects his team, there is more formal evidence for the contagiousness of positivity.²² Fowler and Christakis conducted a study that demonstrated the spread of happiness among connected individuals.²³ They showed that individuals connected to many happy individuals can be reliably predicted to become happier in time to come; an effect that is limited to three degrees of separation and is observed in the form of clusters of happy and unhappy people in the social network. In addition, the researchers' use of longitudinal statistical modelling provides support to the view that these clusters of happiness are a corollary of the spread of happiness and not merely due to the tendency of similar individuals to seek out one another's company.

As our soldiers become more competent in the functions they perform, they can evaluate themselves in a more favourable light, and hence gain more self-respect. Moreover, when the enhanced competence and operational effectiveness of our soldiers are showcased in public events and bi/multilateral exchanges, confidence in the SAF will be reinforced and our already strong deterrent effect will increase.

Moreover, another modelling study that used the same data set provided formal evidence for the spread



2LT Arshaq all smiles as his brothers put his new rank on his uniform.

of negative emotions within social networks, which was likened to an 'infectious disease'.²⁴ In the light of such evidence, one can imagine how a soldier's negativity could undermine the beliefs of his fellow soldiers, especially those of the full-time national servicemen (NSFs), that they are serving their country in a meaningful way and hence harming the latter's commitment to defence. As the NSFs share their negative experiences with their friends outside our Army, the respect that our citizens, defence partners and potential adversaries have for our Army would be adversely affected. Moreover, it is also wholly possible that any cynicism displayed by our seasoned regulars could easily poison the minds of those who have just joined the service, brimming with passion. If cynicism were to be pervasive in our Army, the nobility of our profession would be greatly undermined and we would then have scant self-respect as soldiers. Arguably, just as positivity can spread and boost team performance, so persistent negativity can over time, erode our operational effectiveness, as well as, impede our path towards becoming a Respected Army.²⁵

The contagiousness of positivity and negativity have an important implication for the Singapore Army: within the tightly interconnected social unit, the emotional fitness of every serviceman also becomes the responsibility of his fellow comrades. To the extent that positivity broaden one's mind and builds vital resources and that the extent that negativity works against this, the Singapore Army could reap compounding benefits, in terms of operational effectiveness and respect, by providing soldiers with emotion-based skills training.

THE NECESSITY OF NEGATIVE EMOTIONS

This essay seeks to make a case for 'decreasing negativity' in the Singapore Army. It is important to note that this essay advocates for the reduction, but not the elimination, of negative emotions. Indeed,

negativity and negative emotions do not mean the same thing.²⁶ Granted, negativity narrows our minds and does not help us build our social and psychological resources. Nevertheless, negative emotions are not detrimental under certain conditions.

Scientists believe that negative emotions have evolved because they have been functionally useful for our survival.²⁷ Fear is associated with the urge to flee, anger with the urge to attack and disgust with the urge to expel, to name a few. One can easily imagine how the aforementioned emotions could have been adaptive in our evolutionary history. Indeed, they would have been useful for determining our response to spotted predators, perceived transgressions and accidentally consumed toxic foods respectively; all these responses would have been vital for our continued survival.

The value of negative emotions is not just limited to our evolutionary history; it also extends to military operations. Negative emotions generated in the face of danger have been associated with important physiological changes. Indeed, under such circumstances, the cardiovascular system directs more oxygenated blood to skeletal muscles, while the adrenal glands release more cortisol to activate more sources of energy by increasing glucose in the blood stream.²⁸ These physiological changes might ostensibly allow a soldier to move faster, act more aggressively and perform better in the heat of the battle.

Although I have argued that negative emotions are important for the success of military operations, it should be noted that modern armies, in general, spend much of their time in mission planning and preparation (in theatre), or in peacetime training, both of which are situations that comes with the risk of injury. Moreover, if the reader is worried that positivity may generate an unrealistically optimistic view of the

battle situation (that may be detrimental to mission success), then he should take comfort in the widely-replicated finding that people integrate information more objectively under the influence of positivity (as described previously). As such, it is apparent that the Singapore Army still has much to gain by increasing positivity and decreasing negativity under many circumstances.

THE RIGHT BALANCE OF NEGATIVE AND POSITIVE EMOTIONS

At this juncture, the reader may be rightly concerned about whether the Army would, by focusing on increasing positivity, necessarily neglect important negative emotions (described in the preceding paragraph). While this is a valid point, it is not one that matches up with the bulk of empirical evidence.²⁹ For instance, Diener and Emmons found that positive and negative effects are relatively independent in the long run. This means that it is entirely possible for one to be high on positive emotions and high on negative emotions at the same time.³⁰ As positive and negative emotions vary in a relatively independent way, we should not worry about neglecting vital negative emotions when we seek to increase our positivity. Moreover, even if certain psychological interventions may increase positivity and decrease negativity at the same time, they probably do not pose a real threat because most people are higher on negative affect and lower on positive affect, than desirable (see later part of section).

The reader may also worry if the focus on decreasing negativity might become excessive, and hence result in the neglect of the negative emotions that serve us so well in the heat of the battle. Such concern is justified. However, it should not stop us

from seeking to reduce negativity, which is defined as the frequent and gratuitous experiencing of negative emotions. While the excessive consumption of vitamin A is potentially lethal, this, in no way, prevents us from attempting to consume foods containing moderate amounts of vitamin A for our visual health. Along the same line of reasoning, the possibility that vital negative emotions might be neglected due to excessive decrement of negativity should not warrant us throwing it out completely.

Now, we know that we should decrease negativity, but not eliminate negative emotions. The next question will be: to what extent should we decrease our negative emotions? Fortunately, there is an answer to this question. Convergent evidence from mathematical modelling, correlational studies and experimental research have revealed that the benefits of positivity occur when the ratio of positive-to-negative emotions that we experience is greater than or equal to 3:1.³¹ Moreover, extensive surveys have demonstrated that most individuals fall below such a ratio and hence could potentially benefit from increasing their positivity and decreasing their negativity.

PSYCHOLOGICAL INTERVENTIONS

How then can we go about increasing positivity and decreasing negativity? Fortunately, just like there is good psychological evidence for the benefits of positivity and costs to negativity, there is also strong empirical evidence for the effectiveness of several psychological interventions aimed at modifying positivity and/or negativity.³² Owing to the relative independence of negativity and positivity, one should not reasonably expect every single intervention to be effective in increasing positivity and decreasing negativity simultaneously.

TO HAVE POSITIVE OR NEGATIVE EMOTIONS HERE AND NOW?

"A man who is master of himself can end a sorrow as easily as he can invent a pleasure. I don't want to be at mercy of my emotions. I want to use them, to enjoy them, and to dominate them."

~Oscar Wilde³³

Positive and negative emotions are both adaptive under different conditions. How can our servicemen decide whether positive or negative emotions are beneficial for them here and now? While this question falls out of the ambit of this essay, it is probably a burning question in the reader's mind. As such, I will seek to provide a short and hopefully satisfactory answer: the development of emotional intelligence.³⁴ This allows the generation of insight about where/when to have positive/negative emotions and the subsequent flexible deployment of emotions accordingly. The former will require a meta-cognitive element. Towards this end, the US Army's Comprehensive Soldier Fitness programme teaches soldiers to improve their capability to differentiate among emotions and to label them, so that they will learn what emotions reveal about themselves and others.³⁵ In doing so, soldiers would be more adept in identifying patterns of gratuitous negativity and in capitalising on opportunities to cultivate positivity. They would also know when negative emotions are necessary.

CONCLUSION

In the essay, I have used empirical evidence from Behavioural and Cognitive Science to advance a case for increasing positivity and decreasing negativity in the military. We need to bear in mind that emotions play a functional and adaptive role in our lives and is not inconsistent with a tough warrior ethos. Only then can we enjoy the benefits of an enhanced operational

effectiveness and command (all three pillars of) respect as an Army, brought about by increased positivity and decreased negativity. 🌐

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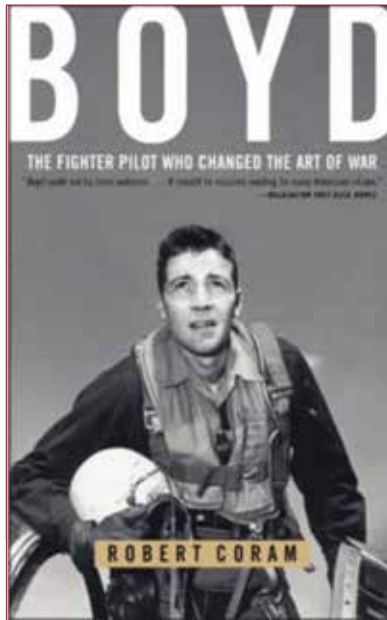
Although the exposition of such psychological interventions lies beyond the scope of this essay, I choose to describe one such intervention that is targeted at increasing positivity. The gratitude visit is an intervention, in which individuals compose and then deliver a letter of gratitude in person to someone who had been especially kind to them but whom they had yet to properly thank. Empirical evidence demonstrates that the gratitude visit results in a lowered negative affect and heightened positive affect one month from the implementation of the psychological intervention (Seligman et al., 2011).

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CPT Chen Jingkai is an Armour Officer by vocation and is currently the Company 2IC of Lion Company, 42nd Singapore Armoured Regiment (SAR). He graduated, top of his cohort, from the University of Oxford with a Congratulatory 1st Class Honours in Psychology, Philosophy and Physiology (PPP). He subsequently graduated with a Masters in Applied Positive Psychology from the University of Pennsylvania. CPT Chen previously served tours as a Platoon Commander in 42nd SAR and a Staff Officer in Joint Operations Department.

Book Review



Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, (New York, Hachette Book Group) 2002, 504 Pages

by **Wallace Tan**

INTRODUCTION

If one were to ask any pilot about Energy-Maneuverability theory, the response is often an exuberant one. The same cannot be said when pilots are posed with questions on the origin of the Energy-Maneuverability theory. Most would give a blank stare, wondering who created the concept of Energy-Maneuverability, a theory that revolutionised the aviation sector ever since. He is none other than Colonel John R. Boyd. This book written by Robert Coram, categorises John Boyd's life into three sections: The Fighter Pilot, The Engineer and The Scholar. Coram looks into the times and events that moulded this aviation legend.

BEGINNINGS

In the opening chapter, Coram gave a flashback to Boyd's childhood and youth. Boyd was born on 23rd January, 1927 in

Erie, Pennsylvania. His father, Hubert Boyd, died on John's third birthday, leaving John's mother, Elsie Boyd, the burden of having to raise the John and his sibling single-handedly. Elsie was a strong-minded, authoritative and unbending mother. After the death of Hubert, Elsie started working to support the family although their neighbours thought that Elsie never needed to, given that Hubert had a good paying job in a big local departmental store in Erie. Coram picked a few instances to highlight the resolute nature of Elsie. In one instance, the Catholic priest of the local church mocked John's sister for stuttering during catechism. After learning about the incident, she telephoned the priest and said, "*I have enough trouble trying to keep this family together without having a priest pick on my children.*" ending the conversation by serving notice that her children will no longer

attend the Catholic church.¹ On another instance, when John came home from school feeling upset that his teacher had asked him why his uniform and shoes were old and torn, Elsie comforted him by insisting that a person's character is much more valuable and important than the material wealth of that person; that as long as one's *"integrity was inviolate, he was superior to those who had only rank or money."*² She also taught John that a man of principle would frighten other people and that he would be attacked for his beliefs, but he must always keep the faith, quoting *"If you're right, you're right."*³ Clearly, Elsie was instilling strict values on her children and wanted to ensure they will grow up with the right principles and values. Indeed, John was instilled strongly with those principles and values.

During high school, Boyd was a member of the swimming team, learning that *"It is just as affective, if not more, to learn and do something correctly and use less energy."* Upon completion of his high school, Boyd enlisted in the Air Force just after World War II (WWII) had ended. Boyd was stationed in post-war Japan as an enlistee before returning to the United States (US) for his pilot

training. Boyd was no stranger to controversy and confrontation as he clashed with his instructors over his pilot training assignment. Boyd then furthered his studies at the University of Iowa, majoring in economics. It was also there that he met his future wife, Mary Bruce. During the Korean War, Boyd was assigned to the F-86 Sabre. Though Boyd scored no kills and only managed to damage one Mikoyan-Gurevich (MiG) aircraft, he impressed his superiors and was chosen to attend the prestigious Fighter Weapons School near Las Vegas, where he eventually became an instructor after performing well during the course.

'40-SECOND' BOYD

Unlike typical instructors who 'go by the book', Boyd always tried to 'tweak' conventional war fighting strategies. During lessons conducted by him, students are forced to think out of the box. Many of the students arrived at Fighter Weapons School knowing very well that they are the 'cream of the crop.' Therefore, it is not uncommon for the students to 'belittle' the instructors. Boyd knew he had to prove his skills to the students for them to be receptive to his unconventional ideas and teaching methods. Using the North American F-100

Super Sabre, he would bet any pilot \$20 that he could let them set up at his six o'clock position within their gun range in a fight simulator and within 40 seconds, he would have their positions reversed. He never lost a single bet. He made use of his experiences gained from the simulated air combat with the students to refine and improve on his theoretical concepts to the highest levels.

Coram then went on to describe how Boyd worked on writing his manual on air-to-air tactics using his own free time. The manual was accepted by the United States Air Force (USAF) and became an official military doctrine titled *Aerial Attack Study*. Boyd was awarded the Legion of Merit in recognition. Until then, air combat was viewed more of an art rather than a science. It was Boyd's work that categorised the different series of counter manoeuvres for every manoeuvre made during air combat. Boyd did not get complacent due to his achievements, in fact, he was just getting started. Boyd applied for a second bachelor's degree and was enrolled into the Industrial Engineering course at Georgia Tech, in search for more knowledge to aid his rigorous analysis of the combat capabilities of a fighter aircraft.

ENERGY-MANEUVRABILITY THEORY

During a lesson on thermodynamics, Boyd's insight came on understanding the inter-conversion of energy and entropy in closed systems. That allowed him to realise that it is the amount of energy that the aircraft possesses that determines the victory of aerial combat. Fighter pilots have learnt that in aerial combat, possessing speed or altitude advantages over the opponent is crucial. What Boyd did was to turn that instinctive knowledge into a rigorous formula, which can be applied on any type of aircraft flying at any speed. This is known as the Energy-Maneuverability Theory, which enabled fighter pilots to evaluate their energy potential during aerial combat. Boyd then used his findings to plot the performance chart of every fighter aircraft in the USAF inventory. During the Vietnam War in the mid-1960s, the U.S. F-4 *Phantoms* and F-105 *Thunderchief* fighter jets were constantly out-won by MiG-19s and MiG-20s. Boyd was summoned to the Pentagon where he explained using his Energy Maneuvrability Theory that the big and powerful F-4 *Phantoms* and F-105 *Thunderchief* were at a

severe disadvantage to the smaller, lighter and more agile MiGs. He worked closely with the Pentagon thereafter in the development and production of the F-15 *Eagle* fighter aircraft that will remain as the best fighter aircraft for three decades. While working at the Pentagon, Coram pointed out that Boyd's confrontational nature got him into frequent 'battles' with the people he worked with, often higher ranked than him. Thankfully, Boyd was posted to Nakhon Phanom Royal Thai Air Force Base (NKP) as the vice-commander for a one-year assignment during the Vietnam War. Even when stationed there, he took every opportunity to visit the airbases, educating the F-4 *Phantom* pilots of the energy potential of their aircraft during aerial combat using his Energy-Maneuverability Theory, as well as that of the MiG-21, used by their enemies (the Communist Forces) at that time. His time at NKP allowed him to formulate new ideas which eventually led him to understand that destruction was a pre-requisite for creation. On 25th June 1975, Boyd was presented the Harold Brown Award by the Secretary of the Air Force. It was the highest award given by the USAF, typically awarded to individuals whose work has led to "a substantial improvement in the

operation effectiveness of the Air Force."⁴ Boyd was only the second person in the US history to have received the award at that point of time.

RETIREMENT AND DEATH

On 31st August 1975, COL John Boyd retired after 24 years of service. However, that did not mean Boyd's work stopped. Boyd published a condensed eight-page article entitled *Destruction and Creation* that intertwined ideas from Kurt Gödel and Werner Heisenberg together with the Second Law of Thermodynamics, "sketching out how we destroy and create these patterns to permit us to both shape and be shaped by a changing environment."⁵ At the same time, Boyd continued to impart his knowledge on aerial combat warfare to anyone, including a senator from Wyoming, Dick Cheney. It was during one of these briefings that Boyd introduced the concept of the Observe, Orient, Decide and Act (OODA) Loop, a complex concept that took hours to explain. In essence, the OODA Loop is a thinking cycle every fighter pilot must process during an aerial combat. The victory will be decided

by who can function inside the time scale of his opponent's OODA Loop; the one who is faster will often be the one that will emerge victorious. This concept has been utilised primarily by fighter pilots and the United States Marine Corps (USMC). However concepts such as the one in the Strategy of the Fighter Pilot, are being employed by American businesses to 'outmanoeuvre' their rival businesses.

On 8th March 1997, Boyd succumbed to cancer and died in a hospital located at West Palm Beach, Florida. He was buried at Arlington National Cemetery with full military honours. Interestingly, the Air Force was under-represented during his memorial service. Despite not being a member of the USMC, a Marine Colonel present at the memorial service placed a Marine Eagle, Globe and Anchor insignia at Boyd's headstone to show appreciation for his contributions and ideas that were adopted by the Marine Corps. According to Coram, this is the highest honour a Marine can ever be bestowed and Boyd became the first Air Force pilot to receive it.

It is true that it can be difficult to understand Boyd's work due to its complexity. Coram's admiration of Boyd can be seen through the book. However, he made no attempt to hide Boyd's flaws. Like every great man, Boyd has his own flaws and weaknesses; no one is perfect. You may disagree with Coram's views on Boyd after reading the book, but you will surely get some valuable takeaways on how the Pentagon works and where the concepts of modern fighter tactics come from. Therefore, this book is a must-read for those seeking to gain a better understanding of the modern US military. 🌐

"Tiger, one day you will come to a fork in the road. And you're going to have to make a decision about which direction you want to go. If you go that way, you can be somebody. You will have to make compromises and you will have to turn your back on your friends. But you will be a member of the club and you will get promoted and you will get good assignments. Or, you can go another way and you can do something - something for your country and for your Air Force and for yourself. If you decide you want to do something, you

may not get promoted and you may not get good assignments and you certainly will not be a favourite of your superiors. But you won't have to compromise yourself. You will be true to your friends and to yourself. And your work might make a difference."

Colonel John Boyd⁶

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Alan Turing (1912-1954)

by Ong Marc-us



"It was a good thing the authorities hadn't known Turing was a homosexual during the war, because if they had, they would have fired him – and we would have lost."

*Professor Jack Good,
wartime colleague of Alan
Turing¹*

INTRODUCTION

From famous innovators like Albert Einstein and the Wright Brothers, to inspirational leaders like Winston Churchill and JF Kennedy, the 20th century is certainly not short of influential people who have changed the lives of people all around the world. One such person, perhaps one of the more underappreciated figures in modern history, would be Alan Turing. Renowned for his groundbreaking work in computer science, mathematics and cryptanalysis that greatly helped the Allies defeat Nazi Germany during World War II (WWII), Turing can also add one of the most important inventions in human history to his long list of achievements, the computer, which has revolutionised the way humans think, work and live.

EARLY LIFE

Alan Mathison Turing was born on 23rd June, 1912, in Maida Vale, London, England to parents Julius Mathison Turing, a member of the Indian Civil Service who served in the Madras Presidency, and Ethel Sara Stoney, who came from an Anglo-Irish family. As a result of

his father's job, Turing, along with his elder brother, John, spent his early childhood with a retired Army couple in Hastings, a town on the south coast of England.

EDUCATION

At a tender age, Turing showed signs of intellectual genius far beyond his peers, even if they, along with his teachers, were not keen to respect it. In a time when appreciation for a more classic education such as business and literature was the norm in upper-middle class private schools, Turing's curiosity and passion for science and mathematics left him at odds with the education system when he was enrolled into Sherborne School at the age of 13. With his lukewarm performances in subjects like literature and history, and his flair and inclination for science and mathematics being cocooned, it was clearly difficult to imagine Turing having a significant impact on the world of science and technology.

Yet, the tenacity and drive to excel and pursue his passion that would become a hallmark of Turing during his later, more

successful years meant that the rigid education system left Turing undeterred to chase academic excellence in his chosen fields. Despite not having studied elementary calculus, Turing was still able to solve advanced mathematical problems beyond his years. At age 16, after being given a book on the theory of relativity by Albert Einstein, Turing not only comprehended Einstein's work, he enhanced and improved Einstein's questioning of Newton's Laws of Motion.

INFLUENCES

While his time at Sherborne School was not exactly productive, one of Turing's most important influences that piqued his interest for science and mathematics came in the form of a good friend whom he had met at Sherborne. It was in science classes that Turing met Christopher Morcom, another gifted student in science. Time in Sherborne was spent with Morcom, who has been said to be Turing's 'first love', on intellectual interactions over subjects like mathematics and astronomy.

It was thus unsurprising that the sudden death of Morcom to complications of bovine tuberculosis deeply affected Turing. No longer a man with religious beliefs, Turing became an atheist, believing more

and more in scientific reasoning and spending more time exploring his passion for the sciences.

RISE TO PROMINENCE

Mathematics

While his role in cracking the German Enigma cipher machines that greatly aided Western allies defeat Nazi Germany in WWII and his subsequent development of the first computer are undoubtedly Turing's finest achievements, his earlier feats in mathematics and cryptanalyst cannot be overlooked too.

In 1931, Turing continued his education at the prestigious King's College, Cambridge. It was here that Turing's brilliance was becoming more evident. At the age of 22, after attaining first-class honours in mathematics, Turing wrote a dissertation that proved the central limit theorem. Although unaware that Finnish mathematician, Jarl Waldemar Lindeberg, had in fact proved this theorem in 1922, his work was rewarded when he was elected a fellow at King's College in 1936 after his graduation.²

1936

Unknown to many, the year 1936 was a crucial year for one of mankind's most important inventions, the computer. In response to the

Entscheidungsproblem (decision problem) created by David Hilbert, a German mathematician in 1928, Turing published a monumental paper, *On Computable Numbers, with an Application to the Entscheidungsproblem*.³ In his paper, Turing proved that there was no solution to the *Entscheidungsproblem* and presented a hypothetical machine (now known as the Turing Machine), that was capable of computing any conceivable mathematical computation if it could be represented by an algorithm. The concept of the computer and computation was based on this paper written by Turing and his Turing Machines now provide a fundamental study in the theory of computation.

Turing would spend the next two years studying mathematics and cryptology at Princeton University in the United States, where he graduated with a Ph.D. in 1938. On his return to England, Turing held a part-time position at the Government Code and Cypher School (GC&CS), a British code-breaking organisation. It was here that Turing would firmly establish himself as one of the world's greatest minds for his work at GC&CS.⁴

SIGNIFICANT ACHIEVEMENTS

WWII: Cracking the Enigma

With the outbreak of WWII, GC&CS was relocated to Bletchley

Park, Buckinghamshire. This was Turing's second home, as he and a group of cryptanalysts spent months trying to break the Enigma, the German electro-mechanical cipher machines used by the Nazis to encipher and decipher secret messages. The Enigma used systems known as rotors to set keys for each message transmitted. Breaking these key-systems would mean being able to decipher these messages.

The Enigma was an incredibly complex cipher machine that many deemed impossible to break. It was only through poor operational procedures and mistakes that enabled Turing and other Allied cryptologists to succeed in cracking the Enigma.

1938: The bombe

While working at GC&CS, Turing focused his efforts on the cryptanalysis of the Enigma.⁵ Although Polish cryptologists had initially broken German military messages enciphered on the Enigma in 1932, by 1938, additional complexity was repeatedly added to the Enigma machines, making decryption an increasingly arduous task.

Drawing on the works of Polish cryptologist, Marian Rejewski, who created the *Bomba*, a machine designed to crack the Enigma

enciphering machine, Turing identified that the most feasible way to crack the Enigma was to build an electromechanical machine that used crib-based decryption. This was dissimilar to the Polish *Bomba*, which depended on an insecure indicator procedure that the Germans changed in December 1938, limiting the Poles to reading only a small minority of messages. Turing, along with mathematician and cryptanalyst Gordon Welchman, began building the *bombe*, to crack the Enigma.⁶

1940-41: Frustrations with the bombe

The first bombe was installed on 18th March, 1940. The *bombe* used crib-based decryption suggested by Turing, searching for possible correct settings used by the Enigma to encrypt a message. As most possible settings would cause contradictions, the *bombe* would detect such contradictions, discard them and move on to the next possible setting. This left few settings to be investigated and translated in detail, making efforts to decrypt messages futile as Turing and his team did not have enough *bombe* machines and people to successfully translate these settings.

Towards the end of 1941, Turing and his team, which comprised of cryptologists Gordon Welchman,

Hugh Alexander and Stuart Milner-Barry were at crossroads with the *bombe*.⁷ The decryption system used by Turing and his team were effective in decrypting German messages, albeit in small quantities. To have a significant impact to aid Allied forces, more people and more bombe machines were needed to decrypt settings and hence messages. The constant adjustments made by the Germans to the Enigma machine added to the level of complexity and difficulty of Turing's task. Having taken the proper military channels to seek for more funds and manpower to operate the bombe, only to have these pleas fall on deaf ears, Turing and his team wrote to then Prime Minister of Britain, Winston Churchill, seeking help for their cause by explaining that their small requirements, in comparison to those needed by Allied troops should their task of breaking the Enigma messages not be fulfilled, were critical and significant in saving both men and money to win the war.

According to Andrew Hodges, a biographer of Turing, the team's letter greatly impressed upon Churchill to supervise his subordinates to give Turing and his team all the support possible. This would prove hugely beneficial to Turing and his team's work on the Enigma.

1941-42: German Naval Enigma and its impact on the Battle of the Atlantic

The Battle of the Atlantic was the longest running military battle of WWII, lasting from the beginning of the war in 1939 to Germany's defeat in 1945, with its climax from mid-1940 to 1943. The Battle was fundamentally an Allied Naval blockade of Germany and Germany's subsequent counter-blockade. Essentially, this battle comprised of the German Navy, known as the *Kriegsmarine*, and elements of the *Luftwaffe*, the German Air Force, against Allied forces and merchant shipping.

The *Kriegsmarine*, unlike the *Heer* (German Army) and the *Luftwaffe*, used much more secure operating procedures while using the Enigma to encipher radio messages.⁸ The Enigma machines used by the *Kriegsmarine* used three rotors from a set of eight, unlike the *Heer* and the *Luftwaffe*, which used three rotors from a set of five that was easier for Turing and his team to decipher. The rotors and its key settings to encipher messages were changed every other day, making it more difficult for cryptologists to decipher and translate messages.

Turing and his team attempted to understand the wiring of these naval Enigma machines. With

help from the Royal Navy, where HMS *Gleaner* destroyed U-33 in February 1941, and members of the destroyer, HMS *Bulldog* seized cryptologic material such as Enigma keys, Turing and his team were able to utilise the bombes to decipher and translate German messages until the Enigma keys ran out. By this time, Turing and his team were familiar with how to decipher German messages.⁹

As a result of this breakthrough, by the end of 1941, merchant ship losses were reduced by two-thirds. The intelligence provided by Turing and his team allowed the British to plot positions of U-boat patrol lines of the *Kriegsmarine* and the convoy lines around them.

However, in 1942, the *Kriegsmarine* switched U-boats to a new Enigma key. This was a blow to Turing and his team, as they were unable to break the new keys and as a result, the Royal Navy was unable to identify the U-boat patrol lines. On 30th October, 1942, crewmen from the HMS *Petard* recovered Enigma information from a German submarine, U-559. Turing and his team finally had the information to break these new Enigma keys. By the end of 1942, Turing and his team were able to once again provide the Allies with information on U-boat patrol lines,

leading to shipping losses being reduced again.¹⁰

Turing's efforts to crack the Enigma and design the *bombe* machines were quintessential to Allied efforts to combat Nazi Germany. Most people, including then Prime Minister of Britain, Winston Churchill, believe that his work shortened the war by at least two years.

WORKS AFTER WWII

With the end of WWII, Turing moved to Hampton, London, where he worked at the National Physical Laboratory (NPL). Some of his most significant achievements there include designing the first stored-programme computer, which he presented in 1946 and his work on the design of the Automatic Computing Engine (ACE). Although a complete version of Turing's ACE was never built, his legacy in building and designing the computer is evident, as his concept has been an influence for other computers like the English Electric DEUCE and the American Bendix G-15.

Turing took up the position of Reader of the Mathematics Department at the University of Manchester in 1948. Subsequently, he assumed the position of Deputy Director of the Computing Laboratory at the same university.

It was during this time that Turing published a paper on artificial intelligence, *Computer machinery and intelligence*, in which Turing suggested a test, now widely known as the Turing test that would test a computer's intelligence and ability to 'think'.¹¹ Turing is widely regarded as the founding father of artificial intelligence because of these works.

Later troubles

It was known to those around him that Turing was homosexual back in 1940, which led to the breaking of his engagement to his fiancée, Joan Clarke, a fellow mathematician and cryptanalyst at Bletchley Park. However, in the 1950s, homosexuality was illegal in Britain. Turing was charged with gross indecency in 1952 after he admitted to being in a sexual relationship with a 19 year-old, Arnold Murray, who broke into Turing's house during a break-in.

Turing's conviction barred him from continuing his cryptographic work at the GC&CE, which had become the Government Communications Headquarters (GCHQ) in 1946, ultimately preventing the world from benefiting from more works from Turing.¹²

Turing died on 7th June, 1954. The cause of his death is widely attributed to cyanide poisoning,

but many alternative theories have surfaced in the years since his passing. In 2009, after a petition that garnered more than 30,000 signatures, then British Prime Minister Gordon Brown apologised for Turing's prosecution as a homosexual, describing the treatment of Turing as 'appalling'.¹³

Recognition and Tributes

After WWII, Turing was awarded the OBE (Order of the British Empire) in 1945 for his wartime efforts. Among a glittering list of tributes in recognition of his remarkable achievements, a statue of Turing was unveiled at Bletchley Park, Buckinghamshire in June 2007 in recognition of his contributions. Turing was also named the second-most significant alumnus in Princeton University's history. Turing has also been recognized in a variety of ways in Manchester, where he spent his last few years, with a road and bridge named after him. In 1999, Times listed him as one of its "100 Most Important People of the 20th Century".¹⁴

Since 1966, the Association of Computing Machinery (ACM) has given out the Turing Award, widely known as the computing equivalent of the Nobel Prize, for outstanding contributions to computing.

In 2014, a historical thriller film *The Imitation Game* starring Benedict Cumberbatch and Keira Knightley was based on a biography of Turing, *Alan Turing: The Enigma*, by Andrew Hodges.¹⁵ The film was a critical and box-office success, with many acclaimed magazines and newspapers like *The New York Observer* and *The Independent* giving it rave reviews.

CONCLUSION

With the 20th century filled with innovators and inspiring people with notable contributions such as Enrico Fermi, Albert Einstein, Alexander Fleming and the like, one could be forgiven for not adding Turing's name to this list. Yet, his pioneering works in the invention of the computer and artificial intelligence, and his wartime efforts at Bletchley Park have ensured that his name will forever be etched in the minds of people forever. Time Magazine sums up Alan Turing's contributions to the world rather aptly: "*The fact remains that everyone who taps a keyboard, opening a spreadsheet or a word-processing programme, is working on an incarnation of a Turing machine.*"¹⁶

It is hard to imagine what could have been of Alan Turing's life and the accomplishments he could have achieved had he lived a longer life. What is certain is that his legacy will truly be a long

lasting and defining one for years to come. 🌐

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Quotable Quotes

It would be well to realise that the talk of 'humane methods of warfare', of the 'rules of civilized warfare', and all such homage to the finer sentiments of the race are hypocritical and unreal, and only intended for the consumption of stay-at-homes.

James Connolly (1868-1919), Irish Social Leader.

As long as a person is involved with warfare, trying to defend or attack, then his action is not sacred; it is mundane, dualistic, a battlefield situation.

Chögyam Trungpa (1939-1987), Buddhist meditation master, scholar, teacher, poet, and artist.

In war, the first casualty is truth.

Terry Hayes (1951) Journalist and Screenwriter.

There comes a time when one must take a position that is neither safe, nor politic, nor popular, but he must take it because conscience tells him it is right.

Martin Luther King (1929-1968), one of the pivotal leaders of the American Civil Rights Movement.

God created war so that Americans would learn geography.

Mark Twain (1835-1910), American author and humourist.

The supreme art of war is to subdue the enemy without fighting.

Sun Tzu (544BC-496BC) Chinese military general, strategist, and philosopher.

Courage is the most important of all the virtues because without courage, you can't practice any other virtue consistently.

Maya Angelou (1928-2014), American poet, memoirist, actress and an important figure in the American Civil Rights Movement.

I'm a greater believer in luck, and I find the harder I work the more I have of it.

Thomas Jefferson (1743-1826), America's Founding Father, the principal author of the Declaration of Independence, and the 3rd President of the United States.

And what greater might do we possess as human beings than our capacity to question and to learn?

Ann Druyan (1949), American author and media producer.

If you don't stick to your values when they're being tested, they're not values: they're hobbies.

Jon Stewart (1962), American comedian, writer, producer, director, actor, media critic, and television host.

It is a curious thing, Harry, but perhaps those who are best suited to power are those who have never sought it.

J.K. Rowling (1965), British novelist best known as the author of the Harry Potter fantasy series.

He who cannot be a good follower cannot be a good leader.

Aristotle (384–322 B.C.E.), a Greek philosopher who was one of the greatest of all time.

If we have no peace, it is because we have forgotten that we belong to each other.

Mother Teresa (1910-1997), Roman Catholic religious sister and missionary who lived most of her life in India.

Better to die fighting for freedom than be a prisoner all the days of your life.

Bob Marley (1945-1981), Jamaican reggae singer, song writer, musician, and guitarist who achieved international fame and acclaim.

The end may justify the means as long as there is something that justifies the end.

Leon Trotsky (1879-1940), Marxist revolutionary and theorist, Soviet politician, and the founder and first leader of the Red Army.

There is no flag large enough to cover the shame of killing innocent people.

Howard Zinn (1922-2010), American historian, playwright, and social activist.

Life is to be lived, not controlled; and humanity is won by continuing to play in face of certain defeat.

Ralph Ellison (1914-1994), scholar and writer, best known for his novel *Invisible Man*.

Instructions for Authors

AIMS & SCOPE

POINTER is the official journal of the Singapore Armed Forces. It is a non-profit, quarterly publication that is circulated to MINDEF/SAF officers and various foreign military and defence institutions. *POINTER* aims to engage, educate and promote professional reading among SAF officers, and encourage them to think about, debate and discuss professional military issues.

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All articles submitted are reviewed on a rolling basis. The following dates indicate the approximate publication dates of various issues:

- No. 1 (March)
- No. 2 (June)
- No. 3 (September)
- No. 4 (December)

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Each article should contain 2,000 to 4,000 words.

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For example:

Chan Kim Yin and Psalm Lew, "The Challenge of Systematic Leadership Development in the SAF," *POINTER* 30, no. 4 (2005): 39-50.

Chan and Lew, "The Challenge of Systematic Leadership Development in the SAF," 39-50.

Ibid., 39-50.

Mark J. Valencia, "Regional Maritime Regime Building: Prospects in Northeast and Southeast Asia," *Ocean Development and International Law* 31 (2000): 241.

Articles in Books or Compiled Works

Michael I. Handel, "Introduction," in *Clausewitz and Modern Strategy*, ed. Michael I. Handel, (London: Frank Cass, 1986), 3.

H. Rothfels, "Clausewitz," in *Makers of Modern Strategy: Military thought from Machiavelli to Hitler*, eds. Edward Mead Earle and Brian Roy, (Princeton: Princeton University Press, 1971), 102.

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David Boey, "Old Soldiers Still Have Something to Teach," *The Straits Times*, 28 September 2004, 12.

Donald Urquhart, "US Leaves it to Littoral States; Admiral Fallon Says Region Can Do Adequate Job in Securing Straits," *The Business Times Singapore*, 2 April 2004, 10.

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If the article was written by the publishing organisation, the name of the publishing organisation should only be used once.

For example:

International Committee of the Red Cross, "Direct participation in hostilities," 31 December 2005, <http://www.icrc.org/Web/eng/siteeng0.nsf/html/participation-hostilities-ihl-311205>.

If the identity of the author cannot be determined, the name of the website the article is hosted on should be used. For example:

"Newly unveiled East Jerusalem plan put on hold," *BBC News*, 2 March 2010, http://news.bbc.co.uk/2/hi/middle_east/8546276.stm.

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